EURêCA 2018 Online Abstract Book

Contents

School of Art – College of Arts & Sciences .................................................................................................................. 2
College of Architecture & Design ................................................................................................................................. 17
Humanities – College of Arts & Sciences .................................................................................................................... 24
Social Sciences – College of Arts & Sciences ............................................................................................................. 31
Haslam College of Business ........................................................................................................................................ 42
College of Education, Health and Human Sciences .................................................................................................. 56
College of Nursing ...................................................................................................................................................... 62
College of Social Work ............................................................................................................................................... 91
College of Communication and Information ............................................................................................................... 93
Honors English 298 – College of Arts & Sciences ................................................................................................. 94
Natural Sciences – College of Arts & Sciences ......................................................................................................... 207
Tickle College of Engineering .................................................................................................................................... 235
College of Agricultural Science and Natural Resources .......................................................................................... 261
Poster Index .............................................................................................................................................................. 272
School of Art – College of Arts & Sciences

Poster # 1

Y-12 – Electronic Interaction in a Museum Space

Jonathan Andrew Young

Student’s Department: Graphic Design
Faculty Mentor: Staples, Carolyn I

Upon traveling to Y-12’s New Hope Center, I was greeted with a series of labeled objects, some bearing tiny descriptions of their original functions. As a native Oak Ridger, it was easy for me to fit these objects into my preexisting knowledge of this place, however, my compatriots had no such luxury. Games present a unique opportunity in learning. While a book can describe an event, and let your mind paint the picture, and a film can present a much more controlled experience, a game is inherently and uniquely interactive. Games present an opportunity not to witness an event, but to experience it. This presents a unique opportunity to facilitate deeper learning through interaction. There are many precedents for this, one in particular being children’s museums, which use interaction and play to “Trojan Horse” in learning. I intend to use games to contribute to a more realized space for learning about the history and future of Y-12.

Poster # 2

Infrared Debonding
Visualizing Outreach at Y-12

Jonathan T McCammon

Student’s Department: Graphic Design
Faculty Mentor: Staples, Carolyn I

Y-12 is known for its groundbreaking research into uranium and its contribution to the second World War, the Manhattan Project. However, over the last several decades Y-12 has amassed a plethora of new fields of research. One of those fields involves infrared debonding. Infrared debonding is the process of using infrared rays to separate components that have been joined by adhesives. Using infrared is a safer and more cost-efficient method of separating components, as well as limiting manual labor and leaving separated components in a better, recyclable condition.

Poster # 3

Pinpoint Travel App

Cameron Grace Spooner

Student’s Department: Graphic Design
Faculty Mentor: Lowe, Sarah

Pinpoint is an application that presents the beginning framework for planning a trip with young adults. Pinpoint is a destination generator that surveys each traveler in a group with a series of questions, considers each answer, and outputs a destination for the group that best fits the each individual’s travel preferences as a whole. Online sites like Yelp and TripAdvisor are great resources while planning a trip, but two out of every three travelers claim they are way too overwhelmed on these sites. Pinpoint can alleviate the stress of information overload by becoming a starting point in trip planning by offering destination, activity, and restaurant suggestions.
Poster # 4

Abstracting Uranium

*Madison Lowe Moody*

Student’s Department: Graphic Design  
Faculty Mentor: Staples, Carolyn I

Over the last six decades, Y-12, at the Oak Ride Labs, has been studying nuclear materials, especially uranium, creating an accumulation of data that can only recently be shared with the world. Upon visiting the Y-12 facility, I thought of the The Manhattan Project and the nuclear bombs that it produced, but the facility as since changed their track from nuclear weapons to nuclear energy and much more beneficial and humanitarian projects. In order to highlight this shift and reflect on the research of the past, the data that is currently available can be represented in an abstract way; systematically creating a digital installation that has a very modern look, while having the capacity to transform as time goes on, as uranium does. This display will take the scientific data, focusing on the life of uranium, and make it enjoyable to everyone from advanced scientists to families that come to see the museums that Y-12 has to offer, because it breaks the information down, but allows for a deeper understanding, due to the systematic abstraction of the data.

Poster # 5

Financial Wizard

*Jordan Katherine Beets*

Student’s Department: Graphic Design  
Faculty Mentor: Lowe, Sarah

My research examines college students with part-time jobs while in school. Specifically, it analyzes how these students with the intention of making and saving money struggle with impulse spending. My process includes attention to the ways of preventing bad spending habits and how to do this most effectively for this specific target audience. I have gathered constructive knowledge from those in this position and have developed further findings through descriptive research. I discovered that similarly to being on a diet, accountability is crucial in pursuit of reaching a set goal. Ultimately, if college students were reminded of their financial goals in face of situations driven by impulse more conscious decisions would be made.

Poster # 6

Air Pollution (Y-12)

*Cassidy Ann Bruninga*

Student’s Department: Graphic Design  
Faculty Mentor: Staples, Carolyn I

While working with Y-12 thus far, I’ve found it extremely compelling to learn all that Y-12 is doing to ensure a safer country in which we live, learn, breathe, and grow. What I look forward to solving is the idea that there are even more ways to ensure a healthier life that I know Y-12 stands for. It has come to my attention that there is a great amount of air pollution that surrounds us each and every day. Yearly, over 100 tons of regulated air pollution is entering into our air. Y-12 has a comprehensive air regulation compliance assurance and monitoring program to ensure that airborne discharges meet all regulatory requirements and therefore do not affect air quality. My goal is to think of ways to add to the prevention already happening. Exploring ways to analyze just how effective these resources are and are there other materials or ways
that Y-12 could adopt that would ensure even safer air for us to breathe. It’s not something we can avoid, but it’s something we can help make an effort towards. A few of these prevention resources are bag houses, exhaust scrubbers, and other exhaust filtration methods. With this research, there is a hopeful solution that will ensure a more proficient and safe air quality.

Poster # 7

Y-12 Interactive Timeline: Experiments in High Dimensional Space

Hannah Gwynne Mcmillen

Student’s Department: Graphic Design
Faculty Mentor: Staples, Carolyn I

The East Tennessee Technology Access Center (ETTAC) in Knoxville, TN is a regional nonprofit agency that helps people with disabilities gain knowledge about and access to assistive technology devices. ETTAC is aware of the power of a successful social media presence and would like to improve theirs in order to expand their regional and national reach. The use of hashtag campaigns and a newly designed ETTAC ambassador will aid in this. After analyzing engagement metrics, social media trends and activity of other nonprofit organizations, a six month plan has been created in order to successfully elevate ETTAC’s social media presence in a bold and memorable way to ultimately increase community involvement and support.

Poster # 8

Kid & Kin

Rachel Gorman

Student’s Department: Graphic Design
Faculty Mentor: Lowe, Sarah

Two decades ago children had little to no knowledge of their long-distance family. Not all relatives live near their grandchildren, nieces, or nephews, so they need to foster the relationships through alternative means. Advancements in technology, such as phone calls, emails, and now video chatting, have bridged the gap to some degree. However, research shows that children learn best through experiencing their senses by playing, which is not present during video chats. I argue that children need tangible items to foster the long distance relationships of grandparents, aunts, and uncles. Through this exploration I intend to provide a way for children to interact, learn, and play while building recognition and emotional bonds with their long-distance family members.

Poster # 9

Revived Clothes c/o Sam Hansen

Sam Hansen

Student’s Department: Graphic Design
Faculty Mentor: Lowe, Sarah

Fast changing fashion trends with low prices are driving people towards constant consumption. This overconsumption is a main reason that fast-fashion has quickly become the world’s second dirtiest industry to big oil. The effects of fast-fashion are getting out of hand, and it is important that designers start rethinking the way they produce their clothing. Promoting environmental consciousness with a sustainable clothing line could be a driving force behind slowing down
some of the detrimental effects that the fast-fashion industry has had on the environment. My brand uses pre-worn clothes from surplus stores, donations, and thrift stores, and then repurposes them towards a look that is more fashion forward and high-end inspired. This project addresses the importance of inspiring young designers to change the fashion industry’s approach to fashion design.

Poster # 10

Ray

Jonathan Andrew Young

Student’s Department: Graphic Design Faculty Mentor: Staples, Carolyn I

In my time developing games for Virtual Reality, I’ve discovered a few things. One, that people find interaction and exploration within the space compelling, and two, that combining the simulated reality with a pair of noise cancelling headphones creates unparalleled immersion, and can create mesmerizing and extremely relaxing experiences. Ray is a virtual reality experience created to be calming and relaxing. Ray provides a quiet and safe place for users to enter to calm down, relax, and contemplate, or to explore and play. Ray features a variety of hand painted environments, rendered in soft watercolor to aid in the goal of producing a meditative space, along with the use of subdued sounds to match the scene the player chooses. Some interaction, such as throwing a rock or chasing a bird, is possible, as well as exploring the worlds within the game, however, one may also choose to simply stay still and watch the world around them.

Poster # 11

Bulletproof Blanket

Jordan R Hubbard

Student’s Department: Graphic Design Faculty Mentor: Staples, Carolyn I

Abstract Not Available

Poster # 12

The Economics of Recycling

Nur Elisa Abdul Razak

Student’s Department: Graphic Design Faculty Mentor: Staples, Carolyn I

The world generates roughly 3.5 million tons of solid waste every day. However, less than a quarter of the waste gets recycled. It is predicted that, given estimated production growth and current recycling culture, our oceans could contain more plastic than fish by the year 2050. This equates to an economic loss of around $120 billion in plastic value every year. This research will analyze recycling with an economic lens and illustrate the significance of recycling in the economy. By highlighting sustainable production and waste disposal techniques that will transform the global materials market, it will also emphasize the urgency for large production companies to adopt sustainable methods of production that would not only conserve the environment but boost the economy as well. This work seeks to create awareness of the importance of recycling so both consumers and corporations are encouraged to take on an active role in the preservation of our environment.
**Poster # 13**

**Uncommon Sense**

*Alisa Kay Harvey*

Student’s Department: Graphic Design  
Faculty Mentor: Lowe, Sarah

Uncommon Sense is a history zine by students, for students. High school history curriculum is often taught as a one-sided chain of events to be memorized, because this makes the subject easier to test. However, one of the ultimate values in learning history is to connect the past to the present and future. Uncommon Sense underscores this connection by giving students a place to share how history affects them personally. Each month, the Uncommon Sense website will post a historical topic. Students can submit their responses to be potentially published and distributed in a zine, a traditionally independent, small-scale format that references a commitment to expressing individual beliefs.

**Poster # 14**

**Pit Pass**

*Caleb Lester Jones*

Student’s Department: Graphic Design  
Faculty Mentor: Lowe, Sarah

Supercross and Motocross have information hungry fans just like any other major professional sport out there. Unlike these other sports, Supercross and Motocross do not release a lot of information regarding team actions and rider actions during the off season in order to retain their edge on the competition. This creates a gap in interesting media coverage during the three months off season from October to December. This is a time that I see could be used to display information that is not normally covered, such as who the pro riders are outside of their racing career. I am creating a monthly booklet that is released during the off season to fill in the gap of less interesting media coverage that is being released while there are no races. This booklet will mainly focus on the personal lives of a select few professional racers and look into who they are as a person outside of racing and display some of their unique personalities. This booklet will be supplemented with an Instagram account so that the audience may interact and help choose what pros are featured in the up coming issues. This system would be a good addition to current Motocross magazines.

**Poster # 15**

**Student Freelance Platform**

*Jack Westphal Petschulat*

Student’s Department: Graphic Design  
Faculty Mentor: Lowe, Sarah

College is an exciting time of transition, where students generally learn the skills they need to enter the adult world. Higher education is intended to teach students the skills they need to become productive members of society, and hopefully open doors to higher opportunities. During their college careers, many students take internship positions to learn what it’s like to participate in a professional environment, and this guided learning experience is crucial in helping them decide their futures.
It’s wonderful that students can take on these positions of responsibility, but in reality, working with an existing company isn’t the only option available to graduates. Studies show that millennials graduating college today make up one of the largest demographics of freelance workers in the US. 34% of the general working population practices some form of freelance work, while 47% of millennials, specifically, practice freelance work. By giving college students helpful tools for managing their own careers outside of the structure of a corporation, we can help ensure their success in future ventures.

This project intends to look at how university environments can teach students how to practice freelance work the skills they need to succeed in a diverse world of business.

Poster # 16
Saliva Sample I : A Study on Personal Identity and Genetic Privacy
Reid J Arowood

Student’s Department: Art Faculty Mentor: Sprecher, Jered Benjamin

Human saliva holds an incredible amount of information regarding our identity, including physical traits, ancestry composition, genetic health risks, and more. How does this genetic identity interact with the personal identity that we create and decide for ourselves?

Saliva Sample I is a biopolitical study of personal identity and genetic privacy. Fifty saliva samples are collected from a diverse group of individuals. The donors are then instructed to label their sample with one word that they identify with/as. Finally, donors are asked to sign a waiver granting the artist permission to access their genetic information buried in their DNA. The resulting samples are arranged and presented as a piece of art, along with the labels provided by the donors. The complexity and diversity of the labels are juxtaposed with the simplicity and aesthetic uniformity of the samples, forming a dialogue between our differences and similarities as a race.

This study is intended to analyze and compare a few of the many facets of our identity, encourage the viewer to assess the sources of their own identity, as well as raise concern for the rising issue of genetic privacy in a world where DNA phenotyping is becoming more and more accessible.

Poster # 17
Process and Benefits of Water Recycling at Y-12
Emma Caroline Russell

Student’s Department: Graphic Design Faculty Mentor: Staples, Carolyn

The idea of recycling materials is not a new practice at the Y-12 National Security Complex. As Y-12 moves towards the future, the process of recycling can expand its reach into other aspects of Y-12 such as recycling water. I want to create a visual that explains the process from beginning to end in terms of the Y-12 complex. In the hopes, people will gain an understanding of the benefits of recycling water and how it can apply beyond the parameters of Y-12.
Poster # 18

Bonne Chance Onboarding

Jennifer Leigh Bondarenko, Thomas Ryan Murr

Students’ Department: Graphic Design

Faculty Mentor: Staples, Carolyn I

Learning coding is akin to learning a language when broken down to its basic components. Both have complex variables that are reliant on the context in which they are used. For instance, a Boolean in coding tells us if a variable is true or false, much like the pronouns of the French language identify a word to be masculine or feminine.

Through our game-based-learning application, our audience of elementary-level French students will gain language learning skills and intercultural empathy that would otherwise take much longer to develop. Coming onto the project and being overwhelmed, we learned about how arrays create structure in code to access a database in a specific manner.

Principle of learning language in context is to reinforce understanding. Just like we are using the context of the code to understand its use, this game will also use context to help people learn French in a more organic way. During the course of this project we are going to look at ways to make things more efficient, essential information for on boarding to help understand the code and expand upon current efforts to embed language, code, culture and context.

Poster # 19

Interactive Experience of Y-12 Technologies

Jennifer Leigh Bondarenko

Student’s Department: Graphic Design

Faculty Mentor: Staples, Carolyn I

Since its establishment, Y-12 National Security Complex has been shrouded in secrecy. It is only in recent years that some of the activities have become public knowledge. The complex was created as part of a nationwide effort, now commonly known as the Manhattan project to create a nuclear weapon. Y-12’s primary mission was to produce enriched uranium.

Over the years, in addition to its core mission of supporting the nation’s nuclear arsenal, the complex has been transformed into the world’s largest storage and recycling facility of nuclear materials. Y-12 has also become the go-to international education center that focuses on nuclear security and nonproliferation. While much of the day to day operations and specific projects at Y-12 remain secret, many of the technologies developed to support those efforts have been made available to the public through patent and research publications.

Currently, some of the technology is on display at the New Hope Center amidst historical documents, publications, video materials, and other artifacts. The presentation of this material is in such a manner that is becomes challenging for a visitor to fully understand the historical or technical meaning. The inability to make connections leaves the entirety of the experience feeling disjointed.

For this project, I would like to research the technologies that have been developed by Y-12 which are available to the public and explore how it could be used for purposes apart from national security. The result will be to create and interactive exhibit that brings together these technologies where they currently are and where they might be projected into the future.
Poster # 20

Leave No Trace

Jayson E Alexander

Student’s Department: Graphic Design
Faculty Mentor: Lowe, Sarah

The growing number of visitors to the Smokies is beginning to show in the form of habitat destruction and large amounts of litter. The Smokies are the most visited park in the country receiving over 11.3 million visitors in 2016. Grand Canyon, which was the next most visited park, also twice the size of the Smokies, only received 4.6 million visits. Adding to this influx of people, the outdoor industry that supplies hikers, campers, and fishermen with their equipment is exploding. The outdoor industry made up two percent of the entire US GDP in 2017, ranking higher than the oil and coal industries. All these individuals must have a place to go, and the Smokies are convenient for a large number of them. Where the problem lies is these park visitors are not being educated on how to care for this place they all seem to love so much. If this behavior is not curbed and ideals like the Leave No Trace Principals are not instilled in children and adults alike, the Smokies will be ruined for future generations and their natural inhabitants. Some form of teaching is needed to inform generations young and old about how to be stewards for the land.

Poster # 21

Vol Gap Year

Margaret Jane Moore

Student’s Department: Graphic Design
Faculty Mentor: Lowe, Sarah

The United States has been known since it’s conception for being a melting pot of different people from different places. Yet many of our youths today are globally unaware due to geographical and social barriers that bar many from traveling to countries outside of the United States. Education systems in other countries have solved this problem by normalizing the gap year—a year long break to pursue a special project or activity, work, or spend time in another meaningful way. Gap years are a perfect way for teens who just finished high school to take a break, learn more about themselves and the world they live in. American teenagers are missing out this personal-growth period after high school due to the pressure to get a degree, start in the workforce, and become an “adult” as soon as possible. Countries that are on par economically with America have young adults who are more globally aware and cognitively diverse than Americans. This trend is still not very popular in the US despite some top colleges encouraging prospective applicants to take a gap year. Harvard states on their admissions websites that pursuing personal projects instead of attending university right after high school will give them acceptance leverage. I am insisting that The University of Tennessee follow suit, but taking it one step further, by implementing a gap year program for admitted first-year students. This project seeks to inform and promote to parents who influence their teenagers to go to college about the gap year in a thorough, organized, and efficient way.

Poster # 22

Uranium Storage Powering the Future

Haley Nicole Carter

Student’s Department: Fine Arts, Graphics
Faculty Mentor: Staples, Carolyn I
The Y-12 National Security Complex, the “Fort Knox of Uranium,” has made it a primary component of their mission as an organization to oversee the secure management and storage of special nuclear materials that have been retired from the national stockpile. In particular, the chemical element Uranium has been a driving focus for their research and action. Y-12 believes that the safe and secure storage of this material now could make way for its potential reuse by the generation of thinkers in the future. This idea peaked my interest in particular as I realized that they have uncovered the incredible purpose this material can serve in the future when new minds pour themselves into the research of it. They understand and realize the capabilities of what they possess and they simply want to preserve it to make it available for future research and education within a variety of scientific fields. Uranium is nearly 500 times more naturally abundant than gold, which means there is a useful amount out in the world, but if we wish to use it as a renewable energy resource going forward, we cannot squander it now. Additionally, the process of Uranium mining and production is not short. It can take anywhere between fifteen and twenty years to complete this process, so proactive measures are necessary in this situation. For these reasons, I feel that an educational space that encourages visitors to challenge the ways they perceive energy (that which is renewable and not) to better understand the need for this resource. Additionally it would allow the user to travel through the space in such a way that they develop a better understanding of the ways Uranium’s production process is time-consuming and how Y-12 is taking the secure storage of the material into their own hands is revolutionary. There would also be opportunities for the visitor to experiment themselves and brainstorm these new, innovative solutions for Uranium usage in the future. The goal will be for the visitor to feel that the future uses of Uranium are endless and it is one of the next renewable resources our nation will look to in the future. They will leave understanding the impact Y-12’s proactive measures will mean for the flourishing of generations to come.

Poster # 23

Point of Impact: Y=12 New Hope Center Installation Design

Robert Parker Jenkins

Student’s Department: Graphic Design

Faculty Mentor: Staples, Carolyn I

On August 6th and 9th of 1945, the United States detonated two nuclear weapons over the cities of Hiroshima and Nagasaki, killing around 150,000 people and affecting millions more. Uranium-235, a rare isotope of uranium, was created at the Oak Ridge laboratories of Y-12 and used in the atomic bomb named “Little Boy’ that was dropped over Hiroshima. These bombings - the only recorded use of nuclear warfare in history - are a mark upon American history and the history of nuclear energy itself, demanding to be materialized as a reminder and a memorial. In being tasked with creating an installation for the Y-12 New Hope Center, I plan to create an interactive installation that details and illustrates the events leading up to, of, and following the nuclear bombings of World War II. Through methods of processing, information design, and in-depth storytelling, the viewer will be immersed in a deeply vivid and emotional experience that calls forth the facts surrounding a pivotal moment in world history - one that could see itself repeated. Rather than creating an atmosphere of blame, this installation will act as a warning and a reminder of the responsibility that rests in the hands of those that hold the power. The installation will also remain as a memorial to those who lost their lives on both sides of the war, bridging the divide of cultural differences and time with the unifying factor of one humanity.

George Santayana, the famed writer and philosopher, remarked that those we cannot remember the past are condemned to repeat it. In a heightened political climate matched with today’s call for increased cultural awareness and activism, his words have never rang more true. Through this installation, history is brought to the forefront and put on display, sparing no details of the power of nuclear energy and the devastating potential it holds. This emotionally charged experience will inform the viewer of what has come before, bestowing a sense of reverence and warning while at the same time paying tribute to those who have lost their lives. By creating this vivid reminder of the past, the viewer can in turn find the hope for a brighter future powered by nuclear energy.
Poster # 24

**Convincing Young Workers to Join Y-12 and Stay**

*Dominic Paul Karr*

Student’s Department: Graphic Design

Faculty Mentor: Staples, Carolyn I

The generation currently graduating and entering the workforce has a specific set of needs, and without satisfying them, Y-12 could be at risk of losing the best and brightest available. Millennials, born between approximately 1980 and 2000, represent 45% of today’s workforce; more leave schooling every day to make that number grow. It is important that today’s companies recognize their desires to better stand out from competition. For example, millennials appreciate knowing that their work means something, that work is done within a good-cultured environment, and that they as employees will grow as they work. Promises like these that Y-12 could provide would be immensely powerful in convincing prospective employees, however it is important to continue to satisfy these employees after they are hired. Millennials have shown great interest in these areas: purpose, feedback, guidance, flexibility, and fun.

The goal of my Eureca submission is to create a dynamic but informative, interactive display of what Y-12 has to offer their employees – not what they do or what they have done, but what they will do and why working there is ideal. In this display, prospective employees could comprehend Y-12’s overall mission, their workplace culture, and the opportunities they provide. In video form, they could hear from current employees similar in age, field, or interest. They could learn more as they leave with takeaway pamphlets. The objective is to give a younger generation a reason to work, in a unique way that making them eager to join Y-12.

Poster # 25

**Teaching Children the Importance of Empathy Through Bucket Activity**

*Laurel Kathryn Tyree*

Student’s Department: Graphic Design

Faculty Mentor: Lowe, Sarah

In order to ensure that our next generations are mindful, observant, kind and caring individuals we must invest time in teaching them traits such as empathy. Empathy at its core is the notion and understanding of being aware of others feelings and emotions, it’s offering help when you see that it is needed, it’s sitting with someone when they’re alone and being mindful of others. While many would argue that this is something that’s observed and learned over time, research shows that children who are shown love and kindness during their early years between four and six are more likely to be empathetic to others.

The concept of filling or emptying someone’s bucket has been around for years. Tom Rath’s book How Full is Your Bucket? uses this idea to teach children that anything they do or say either fills or empties someone else's bucket. I’ve created a game that will encourage parents to have conversations with their children asking them about the state of their bucket and how they’ve helped fill others buckets, or likewise what they’ve done recently to empty others. The activity also allows parents the freedom to frame the activity as they wish. Providing parents and children an opportunity to have these conversations is a simple yet powerful way to instill empathy and traits such as mindfulness, observation and caring.
Poster # 26

Visualizing Atmospheric Changes

Alaysia Seraiah Ann Jetter

Student’s Department: Graphic Design
Faculty Mentor: Staples, Carolyn I

While studying the progress that Y-12 National Security Complex has made, Y-12 is currently developing a way to transfer energy, known as KRUSTY, in order to power the future explorations of Mars as a result of the changes in the atmosphere on the planet. The research presented involves the research and comparisons of the atmospheres of both Mars and Earth. The atmosphere on Mars once used to classify the planet as habitable; however, research now states that the atmosphere has altered. The data presented will also stem from studying Y-12’s involvement to create a solution for human exploration on Mars in order to understand Mars’ new atmospheric changes. The goal is to develop an engaging visual narrative that clearly depicts to Y-12’s targeted audiences, dignitaries, families, and especially new employees, the importance of this gradual atmospheric change and how Y-12 is creating solutions for this issue.

Poster # 27

"The Power of an Atom", Digital Interactive Experience at the Y-12 New Hope Center

Vadim Bondarenko

Student’s Department: Graphic Design
Faculty Mentor: Staples, Carolyn I

Since its establishment, Y-12 National Security Complex has been shrouded in secrecy. It is only in recent years that some of the activities have become public knowledge. The complex was created as part of the nationwide effort, now commonly known as the Manhattan project, to create a nuclear weapon. Y-12’s primary mission was to produce enriched uranium.

Over the years, in addition to its core mission of supporting the nation’s nuclear arsenal, the complex has been transformed into the world's largest storage and recycling facility of nuclear materials, as well as the go-to international education center that focuses on nuclear security and nonproliferation. While much of the day to day operations and specific projects at Y-12 remain secret, many of the technologies developed to support those efforts have been made available through patent and research publications.

Some of this technology is on display at the New Hope Center alongside some of the historical documents, publications, video materials, and other artifacts. However, it is presented in such a manner that is difficult for a visitor to gain any significant historical or technical context. Additionally, some related objects and exhibits are so widespread, leaving the entirety of the experience feeling disjointed. This project seeks to re-examine the use of public spaces at the Y-12 New Hope Center and explore possible ways to transform them into digital interactive experience installations that focus on nuclear energy and the technology stemming from it, its origins, present state, and its trajectory into the future.

Poster # 28

Confined Inside the Fences of the Secret City

Justin Craig Keyes

Student’s Department: Graphic Design
Faculty Mentor: Staples, Carolyn I
Many technological advances were derived from the research conducted during the Manhattan Project, and they have an important place in the history of Y-12. However, the experiences of those in their developmental years within the confinements of a secret government reservation express an interesting perspective on this history. This reservation generated an enriching and diverse community for those within the perimeter. I hope to develop an engaging visual account illustrating how this melting-pot of people impacted this area of East Tennessee, and how it continues enrich the surrounding communities.

Poster # 29

Interactive Data Visualization

Thomas Ryan Murr

When it comes to Y-12 most of the population instantly thinks of the Manhattan Project and nuclear weapons. This was my natural inclination as well until I did further research. I found that Y-12 deals in a multitude of projects that help the world rather than harm, and they are working hard to move past the stained image the Manhattan Project has given them.

Y-12 is working to move past the cold war and into an era of getting rid of weapons of mass destruction, however they’ve gone a step even further. Y-12 is now taking the enriched uranium from the bombs and turning it into substances for good. Medicine, energy, and research tools are just a few ways they are repurposing this dangerous material. This both helps individuals, as well as gets nuclear materials out of the world and into safer hands.

My project focuses on Y-12 securing nuclear materials and turning them into tools to help people. This information can be dense and hard to understand, so I found it best to present this to the public via an interactive experience. My experience will take the individual from the creation of a bomb all the way to turning it into medicine, energy, etc. A hands-on, virtual experience will be more engaging and help with learning the information.

Poster # 30

Protypo

Sierra Renee Plesce

Alzheimer’s disease clinical trials fail at a rate of 99.6%. This failure is due, in part, to the fact that patients enrolled in clinical trials are often not identified until they are in the third stage of the seven stages of Alzheimer’s disease and pass away before a complete study can be conducted. There is great possibility for a cure, if only researchers had access to more comprehensive data. My solution is to enroll people with a family history of Alzheimer’s disease in an app that analyzes sound bites for change in use of pausing words, complete pauses in speech, stuttering and loss of vocabulary over time. That data will then be sent to a researcher website and logged as anonymous case numbers, where researchers can dig through the data as it comes in. Focusing on an audience of ages 18-55, the app will study patients before they develop the disease in an effort to help researchers understand how it develops. The app and website combo will be called Protypo. The name nods to the Greek origins of the language of medicine and means “pattern,” for the patterns in human behavior that Protypo will be analyzing.
Poster # 31

Cause and Effect

Wenx Lyu

Student’s Department: Graphic Design Faculty Mentor: Staples, Carolyn I

During Manhattan Project, Y-12 was built to research Uranium enrichment technique. Along with the atomic bomb were made successfully at Oak Ridge, the Uranium enrichment technique inevitably brought damages to our lives such as radiations, doomsday clock. Thus, nuclear power is always considered extremely dangerous. However, with the technology growing, the nuclear power now has been using in multiple areas. In which, the establishment of nuclear power plant is the most prominent. Enriched Uranium as the main fuel for the nuclear power plant have been serving 20% electricity power in U.S, which certainly brings various of benefits to our lives. The project will create an experience that allows the audiences to understand the advantage as well as the disadvantage of this naturally occurring substance.

Poster # 32

ETTAC: Creating a Social Media Strategy for a local non-profit

Hannah Gwynne Mcmillen, Dominic Paul Karr, Robert Parker Jenkins

Students’ Department: Graphic design Faculty Mentor: Lowe, Sarah

The East Tennessee Technology Access Center (ETTAC) in Knoxville, TN is a regional nonprofit agency that helps people with disabilities gain knowledge about and access to assistive technology devices. ETTAC is aware of the power of a successful social media presence and would like to improve theirs in order to expand their regional and national reach. The use of hashtag campaigns and a newly designed ETTAC ambassador will aid in this. After analyzing engagement metrics, social media trends and activity of other nonprofit organizations, a six month plan has been created in order to successfully elevate ETTAC’s social media presence in a bold and memorable way to ultimately increase community involvement and support.

Poster # 33

Showcasing Sustainability at the Y-12 National Security Complex

Alexa Montana Pavon

Student’s Department: Graphic Design Faculty Mentor: Staples, Carolyn I

While studying the progress Y-12 has made in sustainability, I want to create an experience to allow visitors of Y-12 the opportunity to experience the evolution and the progress Y-12 has made to date and project what might be achieved in the future. By using numbers and data to inform our visualization, I hope to create an emotional reaction. I am wanting to create an immersive experience that will convey the urgency, scope, scale and complexity of the task Y-12 is undertaking.

While our experience will be interesting and informative to the families and dignitaries visiting Y12, I will focus the installation on aligning with Y-12’s goal of attracting new, younger employees who find value in creating a sustainable and progressive future.
Poster # 35

One Blood: understanding HIV Through Virtual Reality

Robert Parker Jenkins, Eliza Razak

Students’ Department: Graphic Design Faculty Mentor: Staples, Carolyn I

Since its outbreak in the early 80s, HIV has killed an estimated 36 million people worldwide. Through the medium of virtual reality and immersive storytelling, our team will illustrate two narratives of the HIV epidemic. These two stories, one following a gay man in America and the other following a pregnant Swazi woman, will immerse the subject in an experience that highlights the disparity in detection and treatment between the contexts of a first world setting and a developing country. Our work seeks to create an affecting and personal experience that evokes a deep, emotional response as well as creating an educational experience that informs the subject on the facts surrounding HIV and AIDS. Through these techniques, we hope to spark the change needed to provide greater international accessibility to HIV detection and treatment methods and create a culture of awareness around a virus shrouded in fear and misunderstanding.

Poster # 36

Y-12

Tiara Nicole Householder

Student’s Department: Graphic Design Faculty Mentor: Staples, Carolyn I

After conducting research on the Y-12 National Security Complex, it occurred to me how significant this area is to Oak Ridge and East Tennessee. It is a historic area apart of the National Park Service that employs thousands of East Tennesseans. Their main goals are security, by deterring nuclear threats, and creating innovative technology to improve the future. Something that I found noteworthy about Y-12 was their involvement in the community of Oak Ridge and East Tennessee. It was surprising to me that it was not showcased inside the Y-12 New Hope Center at all. I think that community involvement is a key aspect of what Y-12 stands for and could make an interesting experience for its visitors. They are also donating to help fund more math and science programs for the youth of East Tennessee, which can help peak interests in future opportunities in the complex. I hope to use this information of what Y-12 already does in the community to create an experience, for their guests and future re-recruitments, and to highlight the essence of the complex within the space.

Poster # 37

Teaching Children About the Importance of Honey Bees

Adelaide Davis

Student’s Department: Graphic Design Faculty Mentor: Lowe, Sarah

Bees are dying rapidly and risk extinction. Humans are scared of bees and often see them as a pest. However, bees play a crucial role in the life cycle of plants and for our food security because they are responsible for pollination. Pollinators are responsible for ⅓ of the food we eat and bees are responsible for over 80 percent of all plant pollination. Humans and Bees can not be separated. Without them, much of our food and plant life would disappear. This project will focus on teaching rising generations of young children about the bees crucial role in our lives and how to protect them. Through
hands on experiences the children will have themselves, they will be able to take a memory from their experience and give it greater meaning. In third grade, children in US schools learn about engaging in arguments based on evidence, social interactions and group behavior, as well as the relationship between cause and effect. Teaching children that pollinators are more helpful than harmful will bring about positive change and empower children to work towards a sustainable future for pollinators and ultimately the planet as a whole.

Poster # 38
Atoms for Good

Ivanna Shliakhova, Dina Alikhanova

Students' Department: Communication
Faculty Mentor: Staples, Carolyn I

During a visit of Y12, we noticed that the visitors center is focused on the history aspect of Oak Ridge. Being international students, we were curious to see how the history is told from an American perspective. The first thing that stood out is that the content of exhibition is targeted only on representations of American culture.

We believe that international visitors would have a completely different experience in the center and this perspective should be considered. Overall, the visit inspired us to work on changing the visitors point of view from the past to the future. Knowing that Y12 is now recruiting new specialists, Y12 should shift their focus to communicating future innovative projects and highlight the benefits of nuclear energy for humanity. The information we have found to support our research about Y12 projects inspired us to focus on creating experiences to demonstrate the innovations with the help of VR technologies. We believe that an immersive experience will create interest for young specialists, students like ourselves, as well as dignitaries that will visit Y12.

Poster # 39
Bonne Chance VR

Jonathan Andrew Young, Jonathan Tyler McCammon

Students’ Department: Graphic Design
Faculty Mentor: Staples, Carolyn I

In learning languages, an effective way to understand a culture is full immersion. Bonne Chance is a mobile gaming app that is designed to immerse students learning French into the language as it connects to the culture. We utilize in-depth research to inspire our visuals, animations, and game mechanics. My research focuses on the visuals of the locations within the app. I am exploring ways to make locations in game look not only visually distinct in each time period, but also true to how they were at that time. Currently, I am focusing on creating areas of France that are true to how they would have looked in the 1400’s. This means researching the architecture of the day both to create generic buildings and recreate major landmarks from that time as they looked then. There is more to recreating a time than how things looked, we must also match how they felt. Empathy and ethnography are important perspectives to inform the creation of a more authentic experience. In addition, the creation of the first non-tutorial section of the game will have huge implications for how the rest of the experience will pan out.
College of Architecture & Design

Poster # 40

Time-operative Space: fluidity of cataloging knowledge

Aubrey Kate Andrew

Student’s Department: Architecture

Faculty Mentor: Akerman, Jennifer Alford

Time-operative spaces conduct contemporary society as an expedient network. Spaces are increasingly perceived as slivers of occupation as time is increasingly fragmented based on instantaneity. This statement resonates more true as society grows interconnected via communication technologies. In turn, urban nomads, defined as people who commute throughout cities at an accelerated rate on a daily basis, can move with more flexibility. This is a working condition of the Digital Revolution.

How is architecture going to address new occupations of space and new time frames of occupying space? As mobile devices continue to emerge as an extension of the human hand, nomads spend more time traversing the urban fabric, and use of public space changes. To study this twenty-first century phenomenon, a library is the institution of choice. This typology is in a highly transitional phase at this point in its history. This transition will determine the future weaving of urban fabric dependant upon how time is spent and how much time is spent in virtual or physical space. Urban fabric will also be determined by connectivity to the cybersphere. A current example is how public locations may or may not be popular based on the strength of its Wi-Fi connection. As technology evolves, this circumstance may also evolve, but as of now, this is a trend amongst activity in urban fabrics.

What elements of libraries are to be preserved as paper archives, creating space themselves, or digital archives, creating space between atmosphere and cybersphere? How is the move from physical archives to digital archives affecting functions of the library? Will elements of libraries disappear as digital categorization methods become more prevalent? In this proposal, place becomes an interface between atmosphere and cybersphere. The threshold is occupied. Deconstructed organs of the library are reimagined in hopes of exploring phenomenon of digital architecture.

Poster # 41

futurefictions: A Reflection on Speed and Urban Resilience in the City of Manila

Mara Celina Naluz Caoile

Student’s Department: Architecture

Faculty Mentor: Akerman, Jennifer Alford

ime and space are two existences that define our perception of experience. They are in constant flux: they shift and turn, and they are almost always moving towards a certain direction. In the book Space and Place: The Perspective of Experience, geographer Yi-Fu Tuan writes, “sense of time affects sense of place. To the extent that a small child’s time is not that of an older person, neither is his experience of place. An adult cannot know a place as a child knows it, and this is not only because their respective sensory and mental capacities differ, but also because their feelings for time have little in common.” Ultimately, this reference establishes the framework for this study, that of time, space, and the rates of changes in between. futurefictions contemplates about the speed in which a city changes over time in order to compose new and dynamic architecture that encourages the preservation of history and cultural resilience through the lens of contemporary urban narratives. The subject of study is Manila, the capital city of the Philippines, and a city that is close
to my existence. Manila as a post-colonial society embodies the impact of how the sense of time affects the sense of place: from the remnants of past foreign occupations, to the rapid influence of modern globalization. Manila poses critical dialogues that address contemporary topics related to the speed of growth and change in the developing world. This study explores how architecture can be used to engage the past existence and present realities of the city of Manila into a future that promotes the translation and adaptation of the Filipino identity.

1. Tuan Yi-fu,. Space and Place: The Perspective of Experience (Minneapolis, MN: University of Minnesota Press, 2014)

Poster # 42
in shadows of disaster: architectural timestamps of earthquake processes

Meredith Rene Graves

People are drawn to places of safety, familiarity, stability – places they call home. The built environment then becomes a visible measurement of the security of a community: if structures are intact, so are the people housed within them. Yet each year with increasing intensity and frequency, natural disasters are wrecking buildings and communities all over the globe. The unstoppable force of a natural disaster remains undetectable and unpredictable, even with scientific experts employing technologically-advanced monitoring systems. Due to its diverse landscapes and amount of coastal territory, the United States consistently suffers from natural disasters. According to data from the National Oceanic and Atmospheric Administration, 2017 endured the most massive natural disasters (in terms of cost, fatalities, and climatic measurements) than any year prior, indicating escalation and not stagnation of annual disaster occurrences. What does this mean for architecture?

Located in the Cascadia subduction zone, Seattle, Washington, is “due” for a massive (8.0-9.0 magnitude of higher) earthquake, followed by a tsunami that could inundate coastal areas in under 5 meters of water. As a speculation into a predicted reality, this project asserts that this “really big” quake finally occurs and severely damages the Pacific Northwest city of Seattle. Fantastical responses to this disaster operate within timestamps taken during significant points throughout the natural process of an earthquake (before, during, after & then before the next one). What architectural processes can tap into the destructive path of this lethal quake to protect and guide the people affected? An architectural tactic explored in this thesis is light; in what ways can light become a beacon of safety, an indicator of relief, a sign of remediation in the shadow of disaster? This thesis intends to cross multiple scales of design and create visions of future fictions that could resemble future realities.

1. Laura Santhanam, “2017 is on Track to be a Record-Setting Year for Massive Natural Disasters in the U.S.,” PBS News Hour, October 13, 2017.

Poster # 43
HOME[place]

Kendall Maple

Student’s Department: Architecture Faculty Mentor: Akerman, Jennifer Alford
Phenomenology of space is an inherent quality of architecture. The research studies phenomenological qualities of space through the relationship between the home, the house, and the occupant.

Home is an idea; house is the manifestation of an idea.

Relationships between occupants and their dwellings are highly personalized experiences - unattainable in other architectural expressions. Key architectural moments within the house are identified for their ties to one’s experience of the home. Abstractions from memories, emotions, and daily rituals are used to generate an architecture that materializes the occupant’s psyche. These materializations emphasize the phenomenological encounters within the house.

Architecture’s stance toward home is object based. Does this object-centric view handicap architecture’s ability to create a feeling of “home”? Does a physical manifestation of an idea limit the spectrum of emotions tied to it? The perception of the home continues to evolve, taking on new objectives, means of fabrication, and cultural expectations. It is manifested by man-made limitations driven by economy, rapidity, and return on investment. These conditions have established a checklist for what a house should be, however these expectations do not consider the unique relationship between a house and its occupant. This relationship varies tremendously from person to person. Every individual has their own version of home - a vision that is continually updating itself. As we change, our idea of home changes. How can dynamic qualities of our psyche be manifested through architecture? The intent is to explore the ways in which architecture can convey the atmospheres of home, materializing the intangible through a spatial experience.

**Poster # 44**

**Urban Identity**

*Mustapha Farrakhan Williams*

Student’s Department: Architecture  
Faculty Mentor: Akerman, Jennifer Alford

Urban progress is necessary in cities, but at what cost to the people? At what point is it the city’s responsibility to accommodate those that are removed from their neighborhoods due to developments?

Economic isolationism, preventing low-income citizens from benefiting from developments in urban areas, is growing out of control. Urban development often negatively impacts a population, no matter the intentions. Historically based on race, today the impacts seem to be implicitly directed at the “have nots.” These populations are not included in the new identity a city creates. The intent of this endeavor is to investigate who in urban populations are removed to make way for city improvements, and what can be done to bring the culture, economics, and social forces to coexist in cities across the country.

Historically, The Great Depression compounded social and economic issues in urban areas. President Franklin D. Roosevelt created a plan to help the country bring itself out of the depression through The New Deal. Intended to help the “forgotten man,” the policies actually prevented blacks and other low-income people from reaping the benefits of subsidized economic stability. Stemming from The New Deal, redlining practices from the Public Works Administration and Homeowners Loan Corporation kept areas marked as “hazardous” or “definitely declining” from development over the years. Coupled with failed public housing projects and areas that remained stagnant over the years, crime increased, poverty levels remained low, and portions of cities became dangerous and undesirable.

Unfortunately, those historical urbanization issues continue to negatively impact cities today. Richard Florida, author of *The New Urban Crisis*, suggests that recently cities have begun welcoming new types of development, at the detriment to low-income, service-class, and blue-collar citizens. The rise of the creative class, tech startups, and venture capitalist firms have brought a new culture to urban areas. As companies and employees relocate to urban centers, these
developments are replacing the areas deemed undesirable with expensive residential and retail spaces. The gentrification of urban neighborhoods removes residents from their homes, and prevents people below a certain income level from benefitting from their city’s progress.

What does it say about a city’s identity that only a certain demographic can enjoy the spoils of the city? At what point is it an architect’s responsibility to design for the client, while also prioritizing the ethical dilemma that faces many designers of the built environment today?

**Poster # 45**

**Infraecture | Infrastructure as Architecture**

*David Aaron Wright*

Student’s Department: Architecture  
Faculty Mentor: Akerman, Jennifer Alford

In today’s society, we are given a systematic way to understand, think, and ultimately, exist in the world. These systems can be seen in christianity, eighteen-wheeler trucks, veganism, or plane travel. All distinctively different, yet similar in that each one defines the way you project yourself. In the layered nature of infrastructure, there are two stages where this primarily plays out: 1 Logistics - What it takes to get the latest, greatest iPhone to the market/the money it will take, the labor, the energy. 2 Culture - The reverberation of getting the latest, greatest iPhone to market. How it affects social status, how it connects us instantly to anyone, anything, anytime. The interesting thing about logistics and culture is the mutually beneficial relationship they have with one another - culture is affected by logistics and vice versa.

The thesis is organized around a few basic question about these two infrastructures and the preexisting relationships they may already have, such as: Societal impact or privatized investing in the large-scale infrastructure is a relatively new concept, how will this affect the norm and will the changing landscape of technology play into it? Can the two systems be combined as a whole to work in synchronicity? Are they exclusive? Primarily, design projects have used technology as a cure for economic, societal, and infrastructural problems. Why is technology the lynchpin in a multi-faceted system? Focusing on the social landscape that is incorporated with physical manifestations of infrastructure, the thesis seeks to manipulate multiple agents of society, utilizing technology, and logistical innovation to help design parameters for complex futures. Aaron Wright

**Poster # 48**

**Haiti Passive Design Choices**

*William Andrew Smith*

Student’s Department: Architecture  
Faculty Mentor: Ambroziak, A Katherine Bambrick

This research explores passive and sustainable design strategies applicable for the mountainous regions of Fond-des-Blancs, Haiti. Recommended strategies will be tested through group designs that explore community development in an area bounded by a rural road and active river. Primary concerns are for energy efficiency, appropriate use of local material resources, land stewardship, and human comfort. Specific to energy use in building design, the research focuses on strategies to promote air circulation, provide shading to reduce direct solar heat gain, and allow for indirect ambient lighting. Locally sourced construction materials also play a role in maintaining temperature control, as well as providing acoustical and optical benefits. Additional research explored effects of color on optics, light, and temperature. Relating to
issues of stewardship and land preservation, this research explores common erosion prevention techniques to address mountain run-off and flash flooding as well as erosion caused by the river.

Poster # 49

The Canopy: An Urban Alternative in Fond-des-Blancs, Haiti

Jonathan William Winfiele, Leah Noel Cassetty, Susan Guyder Stewart

Students’ Department: Architecture
Faculty Mentor: Ambroziak, A Katherine Bambrick

This research master plans an “urban alternative” housing solution for a rural community in Fond-des-Blancs, Haiti. Currently, most Haitian families live in isolation from one another, without indoor plumbing or electricity. Our proposal contrasts existing conditions with densified cooperative housing offering modern amenities.

The scope of the project is an approximate 15-acre site bordered by tree groves, ravines, a small river to the north, and a main road to the south. We are designing for a mixed demographic of approximately 60 households. Greenspace and public buildings add communal and commercial program.

The master plan is organized to ensure equity and diversity in the distribution of public buildings, starter homes, medium homes and large homes. A form-based code ensures cohesion, rhythm, and order among structures. In addition, the code applies sustainable strategies to both the communal and residential designs.

The apotheosis of our strategy is continuous canopy or parasol. Serving a dual purpose of utility and cultural expression, the parasol works with the tree canopy to provide shade, creating gathering spaces that enforce inclusion, social unity, and protection. Architecturally, it frames views and light while collecting water and solar energy.

This urban alternative is a model for housing designed to facilitate relationships through proximity and modern conveniences.

Poster # 50

TRANSECTING THE HEART of the Federal Center South Building 1202

Aubrey Sofia Bader, Sandra M Ghabrial

Students’ Department: Architecture
Faculty Mentor: Davis, Marleen Kay

An oxbow in a river creates a peninsula with a unique environment, distant from the surrounding land. Similarly, the oxbow-shaped Federal Center South Building 1202 contains a peninsula, an enclosed atrium, with an environment unlike the flowing current of offices that surround it. The cool modern offices are contrasted with the warmth of the central timber structure. The exposed timber beams and columns consist of wood reclaimed from a warehouse that previously stood on the site. In conversation with the modern oxbow of offices, the timber is reinforced by steel beams, giving it new life.

During our initial research phase, we investigated the context in which the Federal Center South Building 1202 was built. As a model of green building practice and sustainable design, this ZGF Architects project set high standards for collaboration and renewal in architecture. Working with the General Service Association, the architects set their priorities on designing a building that would not only serve the needs of the client, the US Army Corp of Engineers Northwest District Headquarters staff, but would address the environment as well. This building received a LEED Platinum rating and is designed to renew the once-polluted industrial brownfield site and restore the Duwamish River shoreline.
After this initial step, our research focused in on a section of the three-story atrium structure with a cantilevered piece. We began our analysis with an elevation drawing, to understand the overall design of this portion of the atrium. As we looked deeper into the structure, we discovered that not all of it is exposed—and not all of it is timber. The primary horizontal structure consists of steel beams, which support secondary timber beams and timber decking. Certain floor elements are hidden behind panels that closely resemble these beams. These and the timber elements are noted and described in our analytical wall section drawing. Additionally, we analyzed the spatial ordering of these elements in three dimensions through an axonometric drawing. This drawing helped us understand the module and repetitive sequences of the structural system. After going through this process of investigative drawing, we have a better understanding of structural systems and the layers of enclosure within buildings.

Poster # 51

The New York Times Building

Katherine Sarah Hill, Lauren Peyton Perry

Students’ Department: Architecture

Faculty Mentor: Davis, Marleen Kay

The New York Times skyscraper illustrates a story of the moral of the United States after the terrorist attacks on the eleventh of September 2001. A need for transparency in all aspects of the workplace was quickly realized and designers such as Renzo Piano and Gensler began developing innovative solutions to adapt to a changed world.

By analyzing a wall section of the structure, we can begin to understand the motives behind each design decision. The need for transparency and openness in architecture inspired a series of ceramic and aluminum rods that work as a sunscreen. This deflection of sunlight allows for fully transparent glass to be used in place of the previously prevalent tinted glass. This technique initiated the first of several attempts to create an energy efficient skyscraper.

Material acted as a key role in increasing the efficiency and durability of the building. The introduction of aluminum into elements of the structure revolutionized the way designers can manipulate space. Aluminum is equal in strength to steel but is lighter in weight, and resistant to rust, making it ideal for exterior surfaces.

The double curtain wall technique and adapted use of materials combine to create the first in a new age of skyscrapers. In a culture where ideologies shift, architecture needs to adapt to the new demands of the people. And in this instance, designers Renzo Piano and Gensler were able to successfully interpret and materialize these wishes.

Poster # 52

Architectural Representation in Wall Section: The New Orleans Bioinnovation Center

Zachary Orig, Destin Wright Manous

Students’ Department: Architecture

Faculty Mentor: Davis, Marleen Kay

Joint research analyzes the New Orleans Bioinnovation Center, a biotechnology laboratory designed by New Orleans based architectural firm Eskew+Dumez+Ripple. The research seeks to better understand the usage of materiality and passive heating/cooling in architectural wall section drawing. In a world where LEED (Leadership in Energy and Environmental Design) certified buildings are becoming commonplace, the Bioinnovation Center seeks to use passive heating and cooling techniques to save money and energy via a complex wall envelope that maximizes insulation and minimizes solar heat gain in a hot and humid environment.
The research answers questions of how architectural representation can be used to study current structures in order to build sustainably and efficiently in the future. Analysis of the New Orleans climate with respect to site and sound was conducted via wall section drawing, axonometric drawing, and material research and representation. The research focuses on the details of structure and enclosure, which consequently gives fundamental understanding to the building’s sustainable design.

The research concludes that multidisciplinary architectural analysis through drawing may be the answer to creating sustainable, technologically innovative buildings that are comprised of smart constructions and energy efficient materials. It is hoped that such drawings may be used as inspiration toward finding alternative means of creative research in the design process for future buildings with LEED certification in mind.

**Poster # 53**

**Renzo Piano’s Modern Wing of The Art Institute of Chicago - In Section**

*Brian Nachtrab, Isabella Anderson West*

Students’ Department: Architecture  
Faculty Mentor: Goeritz, Hansjoerg

EURêCA Abstract: Modern Wing of the Art Institute of Chicago in Section

When tasked with diagramming the section cut of Renzo Piano’s 2009 Modern Wing addition to the Art Institute of Chicago, we knew we had a monumental task ahead of us. After tracking down a suitable working drawing on which to base our research, we began to draw, and by proxy understand the wall section of the Modern Wing. Working with at most two drawings and a limited number of dimensions (and a limited page size for the display of the drawings) was a challenge to say the least, and a challenge that was in the end successfully beaten. Through this process, we discovered the ways Piano sought to treat the—at times—harsh sunlight of Chicago, and various ways he made the performance of the building more efficient. Methods such as a double-curtain wall system with UV treated glass and motorized sun shades in conjunction with the now iconic “flying carpet” brise soleil that “floats” over the structure help to achieve Piano’s goals of sun treatment and energy efficiency. The lessons learned through this project will surely have a positive influence on our future design projects and will help us to create projects that hold a better dialogue with the environment in which they reside.

**Poster # 54**

**Layers of Memory: Connecting the Roman Forum to the Theban Necropolis**

*William Dillon Dun*

Student’s Department: Architecture  
Faculty Mentor: Kalas, Gregor A

The Church of Santa Maria Antiqua lies between the southern portion of the Roman Forum and the western bank of the Palatine Hill. Over 1,000 miles southeast of Rome, Hatshepsut’s Mortuary Temple rests within the eroded cliffs of Deir el-Bahri near Thebes, Egypt. Though these structures are separated by nearly 1,500 years of construction history, they are connected by a theme that defined their purposes in antiquity – architectural reuse by early Christians. Whether it is the Monastery of Phoibammon’s appropriation of the pharaonic burial chambers at Deir el-Bahri or the early Christian’s adaptation of Emperor Domitian’s first-century CE palatial annex in Rome, architectural reuse shapes the composition of the built environment in antiquity. In addition to this general connection, the presence of Coptic (Egyptian Christian) stuccoes within the Santa Maria Antiqua and the decorative depictions of healing saints (such as Saints Cyrus and John)
within both structures suggest a more substantial link between the retrofitted Theban necropolis and the ancient Roman church. By using the themes of architectural layering, ritual healing, and hagiographic decoration as analytical motifs, this project seeks to identify potential architectural connections between these two ancient structures.

Poster # 55

MAX

Rachel Christiane Elbon, Sierra Denise Holder, Jeremiah Xavier Corbett

Students’ Department: Architecture

Faculty Mentor: Rose, James Richard

Local Motors is a national additive manufacturing facility that invests in the future of 3-D printing. OLLI, designed by Local Motors, is a 3-D printed, automated bus coming to Knoxville, TN, in the summer of 2018. OLLI has been implemented in Washington D.C and Las Vegas in local public transportation. MAX – a bus stop being designed for OLLI - is an adaptive microclimate bus stop that changes form based on its surroundings. Utilizing site factors that exist within specific regions, cities, and streets, MAX responds to these factors by changing the form, its perforations, and the types of plants that live within MAX. The goal for MAX is to create a connection between the bus stop and the bus (OLLI), and help tie together the community of the city through these additively manufactured additions to Knoxville.

Humanities – College of Arts & Sciences

Poster # 56

Representation of Human Musculature in the Bronze Age Aegean

Emily Rose Brower

Student’s Department: Kinesiology

Faculty Mentor: Van de Moortel, Aleydis

Bronze Age sculptures range from abstract to realistic, but how accurate are the realistic sculptures? To answer this question, it is useful to compare three pieces of artwork: Prince of Lilies from Knossos, Kouros from Palaikastro, and the Boxer Rhyta from Ayia Triadha to a musculature replica. These pieces originate from the Bronze Age in the Aegean. What this comparison will tell us is how much the ancient peoples were studying the human body, along with the reasons as to why these sculptures were portrayed with such realistic characteristics. To accomplish this goal this paper takes the artifacts background into consideration, while measuring the length of several muscle groups and comparing them to an anatomical representation.

The results showed varied accuracy with how the artifacts compare to anatomical models. One of the artifacts is shown to be almost identical to the anatomical replica. Other conclusions involve the backgrounds of the sculptures which range from religious reasons to possible images of royalty. Each provides insight into the life of the Bronze Age Aegean. In addition, a further study into the Prince of Lilies from Knossos, showed that the artifact was reconstructed, and that there are some controversies surrounding the reconstruction.
**Poster # 57**

**A Recipe for Disaster: The Athenian Plague and the Peloponnesian War**

*Meera Ranee Patel*

**Student’s Department:** Classics  
**Faculty Mentor:** Van de Moortel, Aleydis

One year after the Peloponnesian War began in 431 BCE, ancient Athens was under attack not only from Spartan warfare, but from infectious disease as well. A mysterious plague struck Athens in 430 BCE, resulting in the loss of a large proportion of its population. Many scholars have tried to determine the identification of the plague, however, it remains unknown today. Despite this uncertainty, the nature of the Athenian plague requires further investigation. This paper addresses the outbreak and identification of the Athenian plague, in addition to how it devastated Athenian society during and after the Peloponnesian War. In order to accomplish this goal, I focus on the History of the Peloponnesian War written by the ancient historian Thucydides, a survivor and witness of the Athenian plague and the Peloponnesian War, and I also explore recent scholarship.

In this paper, I show that the Athenian plague was intensified by a combination of factors, including overcrowding and poor sanitary conditions. I also speculate about the identification of the plague, using archaeological evidence. Lastly, I examine the sociocultural and political implications caused by the plague that led to the rapid degradation of Athens.

**Poster # 58**

**Roman Imperial Cult relating to the Roman Pantheon**

*Kelsea Denise Henderson*

**Student’s Department:** History  
**Faculty Mentor:** Latham, Jacob Abraham

The Imperial Cult was an Ancient Roman phenomena that truly exploded in 44 BC with the death of Julius Caesar and then lasted far into the later Roman empire. It included the worship of the emperors of the Roman empire based off the senate’s decision. The worship happened while they were alive and also when they were deceased. This worship was an integral part of the functioning health of the empire. Imperial cult worship although conducted differently in each region was a core value of each city state, which allowed them to connect to the empire and be gradually inducted into the order of the Roman way of life. Imperial cult worship was so important it was considered treasonous to ignore those civic duties as a individual. It included making sacrifices and praying to both their original deities and then the specific emperor they used for cult worship.

This worship of the emperors is often disputed between two categories: one being that the imperial cult worship was strictly separate from the worship of other deities and the other being that they were intertwined not separated. It includes this idea that the act of worshipping emperors was not just a political move to keep from being arrested, but something that everyday citizens believed to be pertinent to their religious duties. Questions that often come to mind when considering this topic is if there is a connection between the worship of the original branded deities and the newly branded emperors, and if so how deep does that connection go? Are the emperors considered on an in between level from human to god or are they on that same status? Whether they are or are not on the same status level as traditional roman deities will then point to the theory of Imperial cult worship being independent from the civic religious life. This paper will prove that in fact Imperial cult worship and the traditional religious worship are integral to each other and often are used in conjunction with one another. The Imperial Cult was on an equal basis with the Roman Pantheon because it
was considered the Roman civic duty of the citizens. Civic duty was often held to the highest of standards because it promoted the welfare and continuity of not just the empire but the individual territories.

Poster # 59

"Sammy" Up to Bat! Notions of Masculinity within the AAGPBL

Mackenzie Michelle Hobbs

Student’s Department: History Faculty Mentor: Sacco, Lynn Ann

Beginning with the U.S. entrance into World War II in 1941, the world of sport for American society began to shift drastically, specifically for women. With the United States’ involvement into the war, professional male baseball players were forced to abandon their jobs to become soldiers. Philip K. Wrigley created the women’s baseball league The All-American Girls Professional Baseball League (AAGPBL) to counteract this problem.1 The AAGPBL (1943-1954) exhibits the experiences of women dealing with the duality of performing as an athlete but also staying confined within their roles as women. This case is particularly interesting because baseball, America’s pastime, is a sport that was specifically designed to manipulate the notions of “manliness” towards more traditional gender norms. Throughout this year, I plan to investigate more thoroughly the foundations and later fall of the AAGPBL through the perspective of a Knoxville native, Doris Sams, and analyze the notions of masculinity and how its role played into the creation of the league and discrimination against the female athletes. I will be working closely with the East Tennessee Knoxville Historical Society for my research, as well as taking a trip this summer to the National Baseball Hall of Fame.

Poster # 60

"The Holy Brick of Birth-giving": A Reassessment of Ancient Near East Birth Bricks and Their Medical Role in Delivery

Emily Jo Liske

Student’s Department: Biochem/Cellular/Molecular Bio Faculty Mentor: Darby, Erin Danielle

The bricks of birth are often described as a birthing tool in ancient Near Eastern societies. Assertions about their function and usage are based almost solely on two sources: ancient religious texts and ethnographic studies. However, upon closer investigation, the religious texts suggest that the bricks were primarily ritual implements, and the ethnographic studies cited only briefly allude to the possible use of bricks prior to delivery.

In order to assess the likelihood that birth bricks were used as a medical aid during labor, I will summarize related scholarship and then evaluate the available textual and archeological sources, the central terminology, and commonly-cited ethnographic studies. I will then make suggestions about the actual functionality of the bricks based on modern clinical studies and analysis of the aforementioned sources. I will conclude that bricks may have served a ritual function during birth in the ancient Near East, but are unlikely to have played a functional or medical role during delivery.
Poster # 61

Edna Pontellier’s Water Awakening and African Divinity Lasirenn

Brooke Hoffner

Student’s Department: English  Faculty Mentor: Jennings, Dr La Vinia Delois

I argue that when viewed through a Haitian lens Kate Chopin uses the Voudou lwa Lasirenn, the Haitian divinity of love and the sea, as a model for Edna Pontellier’s spiritual awakening. A Haitian divinity spawned in the African diaspora in the Americas is a more fitting mythical, religious analogue instead of Greek divinities due to the novel’s American South setting, Chopin’s residency in New Orleans, and her exposure to Haitian Voudou and West African traditional beliefs. Because of the past demonization of West African religions and mythology by Western scholars and their lack of familiarity with African diaspora religious pantheons, many of their critical readings defaulted to Christianity and the Greek pantheon. I challenge Sandra Gilbert’s "The Second Coming of Aphrodite: Kate Chopin’s Fantasy of Desire" (1985) and Cynthia Griffin Wolff’s "Thanatos and Eros: Kate Chopin’s The Awakening" (1975) that locate the protagonist’s spiritual persona through Greek divinities Aphrodite, Thanatos, and Eros in Chopin’s The Awakening. I incorporate field research I conducted in New Orleans, Louisiana, to uncover Chopin’s links to Voodoo and Haitian connections in the gulf city from 1870 to 1879 that The University of Tennessee, Knoxville, English department supported. My evidence denotes strong support for Kate Chopin turning to an African paradigm for shaping the novel’s protagonist in The Awakening.

Poster # 62

Caroline Earle White and the Animals Rights

Hannah Nelsen

Student’s Department: History  Faculty Mentor: Freeberg, Ernest Frithiof

The history of the animal rights movement in the United States is a fascinating, multi-layered story for the social historian or the social activist. The goal of this thesis is to examine the life of Caroline Earle White and how her womanhood hindered her personal ambitions in the animal rights movement while also allowing her a unique advantage in her reform activities. White and her husband, along with other prominent Philadelphia men, founded the Pennsylvania Society for the Prevention of Cruelty to Animals; however, the men White worked with prevented her from joining the executive board because they could not imagine a woman in any position of authority over male agents and lobbyists. Eventually, White would work past these temporary setbacks and go on to form two other organizations in Philadelphia related to animal cruelty prevention, and would be influential in the establishment of both state and federal laws related to anti-animal cruelty. This thesis will analyze how important men saw the animal welfare cause as too feminine or sentimental for male activists, and scholarly analysis suggests White’s efforts were more appreciated and respected than the efforts of her male counterparts due to these biased historical and societal beliefs.

Poster # 63

A More Perfect Lie: Espionage and Propaganda in the Early Cold War

Marina J McKinley

Student’s Department: History  Faculty Mentor: Liulevicius, Vejas G

The Early Cold War was fraught with uncertainties not the least of which was the nature of espionage. A new “frontline,” intelligence became vital due to the threat of nuclear war and geopolitical influence around the globe. However, now that
much of this information has become declassified in the West more than half a century later, one key aspect of Cold War espionage becomes clear; the value of a spy on either side of the iron curtain existed more in his use as propaganda than the intelligence he gathered.

The first step in this analysis involves the research of various individuals that colored the public opinion so strongly. In the West, Kim Philby’s account was infamous among Western readers. On the Soviet side, two individuals, Victor Kravchenko and Arkady Shevchenko, had much a similar effect on the Soviet citizens at the time when they defected. Despite these case studies being part of two different countries on opposite sides of the Cold War, the way with which both countries utilized spies as object of propaganda is a commonality that warrants investigation.

The next stage is to examine the scholarship on the topic of espionage at large. While the contemporaries of these individuals speculated wildly on the nature of their infiltration and work, modern declassification of documents reveals that their espionage was far less consequential than their contemporaries speculated. Modern scholarship focuses on the social implication and modern memory of these spies. This research project falls more in line with modern thought, as scholars try to predict the ways with which espionage impacts public.

Finally, The research concludes with the future predictions of value in this style of social history.

This model will be compared to modern instances of espionage such as the Patriot Act, Edward Snowden, and the NSA. Without necessarily taking a side on either of these arguments, the goal is to examine public response and what might one day be used as evidence to future historians such as news publications, political cartoons, and press statements by agencies like the NSA.

**Poster # 64**

**Alternative Facts: Partisan Press Coverage of the French Revolution**

*Hannah Michele Nolan*

Student’s Department: History  
Faculty Mentor: Magra, Christopher

Utilizing framing, exaggeration, and selective coverage of the French Revolution (1789 – 1799), partisan newspapers sought to create an American political culture sympathetic to their affiliated party, contributing the growing ideological divide caused by intense competition between the Federalist and Democratic-Republican parties during the 1790s. Focusing upon Philadelphia, the nation’s capitol between 1790 and 1800, this study examines and compares newspapers printed within the city between 1790 and 1794, the year the Reign of Terror ended, to explain how party ideology and affiliation shaped coverage and commentary of the Revolution. An analysis of both the content and location of reports on the French Revolution within these papers reveals that editors 1) framed and presented information, or misinformation, in ways that mirrored party attitudes toward the Revolution, 2) drew connections between French and American current events to highlight either the chaos or success of the French Revolution, and 3) invoked the French Revolution to undermine the legitimacy and credibility of opposition papers and parties.

**Poster # 65**

**Why Evelyn Hazen Sabotaged Her Own Reputation: Gender dimensions of the judiciary through the lens of a 1920s-1930s Knoxville Breach of Promise Suit**

*Mallory C Donoghue*

Student’s Department: History  
Faculty Mentor: Sacco, Lynn Ann
1920s and 1930s Knoxville, like most of postwar America, was particularly complex in terms of gender relations. The end of World War I ushered in industrialization and a wave of consumer culture, with this evolution arrived a change in the conception of gender and equality. Of course, many vestiges of strict Victorian morality still remained. The majority of women were confined to certain careers, expected to be obedient wives, and were severely limited in their legal rights. However, the Sexual Revolution in the 1920s was a direct challenge to previous ideas of female purity and morality and distinctly changed how thoughts on gender evolved during this time.

The reshaping of what gender meant and defined was apparent across America, Knoxville included. However, the amount of scholarship on gender specifically in East Tennessee is severely limited. Evelyn Hazen, born in Knoxville in 1899, is an ideal lens through which women and gender in the area can be analyzed and understood. To further narrow the scope, Hazen’s legal history provides a unique insight into the gendered aspects of the legal system in place in Knoxville during the 1920s and 1930s. In 1934, Hazen sued her former fiancée, Ralph Scharringhaus for Breach of Promise to Marry. In the process of the trial, she divulged that the two had a sexual relationship during the fifteen-year-long engagement. There was excessive news coverage of the case, which spawned from Hazen’s prestige in the community as well as a general public interest in gossip and drama of this sort. The highly publicized nature of the trial produced a regional scandal that would wreck Hazen’s social status; but she surely would have been aware of this outcome before choosing to sue.

Utilizing Evelyn Hazen as a tool to show how gender defined the legal system in 1920s and 1930s Knoxville requires several essential questions to be answered. Namely, what were her motivations behind the decision to file suit against Scharringhaus? On a similar note, why did she stay engaged to him for such an extended period in the first place? If she was worried for her reputation, as she claims, she would not have made her personal life—especially her sexual history with Scharringhaus—public through a scandalous, high profile, trial. Hazen’s motivations for ruining her reputation are currently unclear, but working towards understanding them may reveal the ways in which Hazen felt constrained by her social and legal status as a woman, the reasons why her peers reacted to the breaking of certain gender rules in the ways they did, and how her gender determined the way she was treated and portrayed during her contentious legal battle.

In a larger context, understanding the role of gender within the judiciary is a vital step in understanding how to combat sexism and promote equality.

**Poster # 66**

**Home is Where the Art Is: How Progressive-Era Women used Fine Art and Folk Crafts to Spark Economic & Cultural Development in Knoxville, TN**

*Margaret Elaine Goodwill*

Student’s Department: History  
Faculty Mentor: Sacco, Lynn Ann

Conversations about art and its role in the progressive era are likely to come up in one’s study of American history. However, the information offered typically centers on northern, urban cities. The South experienced the progressive era, too, and just like in New York and Chicago, women were leading the charge. The dominant discourse on Southern women in Appalachia seems to suggest that they were mere victims of an oppressive environment: isolated, with no education, no money, and no cultural influence. In my research, I examine how women across social classes in progressive-era Knoxville defied this narrative by using art as a way to stimulate the economy, promote agency among women, and influence culture. This project consults eleven primary sources and ten secondary sources to offer a new depiction of Southern, Appalachian women during the progressive era: women who mobilize to teach folk crafts to young girls as a merchandisable skill, women who become masters of their art and fiercely advocate for its availability to the public, women who use their place within their “social sphere” to improve the lives of families in the greater Knoxville area. I
have found that the changes brought about by these women caused a shift in national conversation about folk art and its place in American society.

**Poster # 68**

**Mandalas in Ancient Japanese Architecture**

*Bailey Prescott Penton*

Student’s Department: Interdisciplinary Programs

Faculty Mentor: Bryson, Megan Culbertson

Esoteric elements have been present within Japanese Buddhism since before the Nara period (710-794), but it was not until Kukai, a monk studying Buddhism in China by the order of the Japanese emperor, returned to Japan that esotericism was recognized as a separate school of Buddhist thought. After Kukai’s organization of Esoteric Buddhist elements in Japan into the Shingon School and the rise in Shingon’s popularity among the imperial court, the influence of esotericism on Japanese imperial and temple architecture became quite prominent. One aspect of its influence was basing architectural layouts on the Diamond and Womb World Mandalas, two of the most important symbols of Shingon that usually appear as two-dimensional paintings. Structures based on these mandalas include Mt. Koya, the center of Shingon, and the abhiseka (initiation) hall of the imperial palace in Kyoto. My project examines whether these three-dimensional mandalized structures are perceived to have the same presence as the painted Diamond and Womb World Mandalas that they are based upon, as well as how the monastic community, the court, and the laity all perceived the significance of these structures during the late Nara, Heian (794-1185), and Kamakura (1185-1333) periods. Following the work of the scholars Cynthia Bogel and Robert Sharf, this study will assess the significance of mandalized structures during the specified time periods not only as tools for Esoteric practices, but also as the divine presence of the buddhas, bodhisattvas, and divine beings that the mandalas embody.

**Poster # 69**

**Reading the Subtext: Genji Monogatari Emaki**

*Amanda Lynn Beasley*

Student’s Department: Art History

Faculty Mentor: Wright, Suzanne

This paper dives into the hidden communications of the Japanese hand-scroll, Genji Monogatari Emaki for insights into the culture of the Heian court, particularly that of the women. Court women lived sequestered and quite lives, but even still they created forms of self expression like popularizing the Early Middle Japanese language that they used (as opposed to Chinese which was reserved for the men). Murasaki Shikibu, the author of the Tale of Genji, used this language to write the tale with colorful and poetic descriptions common to Japanese literature of the time. Color being another realm of expression open to women, not just through writing but through their fashion as well. Court women wore elaborate kimonos carefully curated with patterns of color to evoke images from nature, like the seasons. This research dives into the intersection between these contexts of everyday life and the images of court ladies in the images from Genji Monogatari Emaki. The images are thought to express emotion through the depictions of the architecture and compositional choices, but how much is conveyed through the use of color and particularly combinations of colors?
**Poster # 70**

**A Quiet Mind: The Key to Musical Performance**  
*Rebecca Ann Percy*

Student’s Department: Music, Wind & Percussion Instruction  
Faculty Mentor: Binder, Shelley L

In this day and age, many people believe they can multitask. From texting and driving to watching television while studying for a test, we always want to accomplish many things at once. Musicians often try to multitask while practicing their instruments. They think about breathing, articulation, jaw movement, finger technique, and more. However, research has proven that multitasking is impossible. According to Christine Rosen in “The Myth of Multitasking,” time and efficiency are actually lost while the brain decides which task to perform. Practicing with a “quiet mind” will lead to peak performance and avoid the detrimental effects of trying to concentrate on many things at once. What constitutes a quiet mind? For my project, I will draw on material from The Inner Game of Tennis by W. Timothy Gallwey, Psycho-Cybernetics by Maxwell Maltz, and others to explain how to attain this mental state during musical performance. I will show how the application of the techniques described in these books can help musicians “concentrate without thinking,” as Gallwey writes. When musicians practice with a quiet mind, they perform with a quiet mind. If they perform with a quiet mind, they are free to play as well as they can imagine.

**Social Sciences – College of Arts & Sciences**

**Poster # 71**

**Who Benefits from the U.S. Preventive Services Task Force’s Screening Mammography Recommendation: Identifying a Relationship Between the False Positive and Demographic Characteristics**  
*Avanti Nitin Rangnekar*

Student’s Department: Economics-Arts & Sciences  
Faculty Mentor: Cahill, Katie

Detecting breast cancer in its earliest stages significantly increases the likelihood of being completely cured of the disease and early detection via cancer mammogram screenings is central to breast cancer control. Consequently, the value of screening mammography to a general female population relies on how often and when a woman should be screened. This study focuses on analyzing the 2015 screening recommendations issued by the U.S. Preventive Services Task Force (USPSTF), which recommends routine biennial screenings starting age 50. Specifically, this paper evaluates the efficacy of the USPSTF decision to modify their screening recommendation from annual to biennial in order to minimize the false positive outcome, a screening outcome that results in unnecessary invasive procedures and added psychological and financial costs to the patient. It identifies a significant or insignificant relationship between false positive incidence and certain demographic characteristics associated with patients using an Ordinary Least Squares regression model and data from the 2015 National Health Interview Survey. Finally, it considers the findings under appropriate ethical frameworks. These research themes arise out of the understanding that, overall, reduced screenings result in a reduced incidence of false positive results; but the female demographic that would benefit the most from reduced screenings is still being understood. The costs associated with a false positive outcome may vary for individuals based on certain demographic characteristics. Therefore, this empirical analysis investigates whether screening less in order to decrease the costs and frequency of false positive outcomes benefits some individuals with certain demographic characteristics more than others. In this way, this paper aspires to identify a demographic profile of individuals who benefit the most from the 2015 USPSTF revised screening mammography guidelines.
**Poster # 72**

**The Medicaid Expansion: Modeling of Important Factors in State Decision Making**

*Augustus Michael White*

Student’s Department: College Scholars Program  
Faculty Mentor: Cahill, Katie

Expansion of the Medicaid program was a crucial component of the 2010 Affordable Care Act. This expansion was intended to allow individuals with incomes up to 138% of the Federal Poverty Level to be eligible for their state’s Medicaid program, with most of the requisite funding coming from the federal government. While the program was originally designed to apply to all states, in 2012 the Supreme Court allowed states to decide whether and when they wished to participate in the Expansion. To date, 19 states have yet to adopt the ACA’s Medicaid Expansion. Cross-sectional studies have previously been used to examine the determinants of expansion decisions. Many of these studies have concluded that political factors are the key drivers of expansion decisions (Barilleaux and Rainey, 2014). However, recent studies contend that factors related to state-need are of greater importance (Henley, 2016). Using a discrete-time-logit model of state conditions and decisions from 2012 to 2017, this study will address the disagreement found in the literature. Further, adopting this approach permits the introduction of longitudinal methods of analysis into the study of expansion decisions. Preliminary results indicate that while gubernatorial party is an important factor, a state’s ‘Medicaid spending growth rate’ and the ‘number of hospital closures’ are also highly influential in motivating adoption of the Expansion. These findings improve our understanding of what factors may prompt future adoptions of the Medicaid Expansion. Additionally, they highlight the tensions that often exist between federal and state actors, of which policymakers must be mindful.

Keywords: Medicaid Expansion, Event History Analysis, duration modeling, odds-ratio, state decision-making, public policy, and Affordable Care Act.

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**Poster # 73**

**The Geography of Opiate Addiction, Overdose, and Treatment in Tennessee**

*David Stanley Leventhal, Meghan H Russell, Kali Margaret Williams*

Students’ Department: Social Science Education  
Faculty Mentor: Li, Yingkui

Opioid abuse has become a national epidemic in the United States over the past 20 years. According to the Centers for Disease Control and Prevention, more than 20,000 Americans died from prescription drugs alone in 2014 – far more than alcohol-related car accidents – and countless addictions plague families across the country. In fact, drug overdose is the leading cause of accidental death in the US, with an astonishing 52,404 lethal drug overdoses in 2015. Of the 20.5 million Americans 12 or older that had a substance abuse disorder in 2015, 2 million were addicted to prescription pain relievers and 591,000 were addicted to heroin. Four in five new heroin users started out abusing prescription painkillers. Chemically speaking, Hydrocodone, Oxycontin, Oxycodone, Fentanyl, and a gamut of other opiate-based pain medications essentially synthetic heroin – they are all derived from the poppy plant. Therefore, people who become addicted to prescription opioid medications often start using heroin when pills become too difficult and too expensive to acquire. In a 2014 survey of people in treatment for opioid addiction, 94 percent of respondents said they chose to use heroin because prescription opioids were “far more expensive and harder to obtain.”1

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The data indicates that not only is the problem getting worse, but also that this is a uniquely American epidemic. From 1999 to 2008, overdose death rates, sales, and prescription painkiller treatment admissions increased in parallel. The overdose death rate in 2008 was nearly four times that of the 1999 rate; sales of prescription pain relievers in 2010 were four times of those in 1999; and the substance abuse disorder treatment admission rate in 2009 was six times that of the 1999 rate. In 2012 alone, US doctors wrote 259 million prescriptions for opioid-based pain medications – more than enough to give every American adult their own bottle of pills. Astoundingly, 80 percent of the world’s opioids are consumed in the United States where just under 5 percent of the global population resides. If you add Canada and Western Europe to the equation the percentage jumps to 95 percent, creating a 24 billion dollar market on which opioid suppliers and the pharmaceutical industry has made vast fortunes.

Tennessee ranks especially high in the number of opioid prescriptions and overdoses when compared to the rest of the US. The Volunteer State is one of only 13 where doctors issued an average of 96 to 143 opioid prescriptions per 100 people. In 2015, doctors in Tennessee wrote approximately 7.8 million prescriptions for opiate-based painkillers – enough for every man, woman, and child in the state. And from 2015 to 2016 the number of opiate-related overdose deaths rose by 10.4 percent, enough to evoke the federal government to allocate 13.8 million dollars in aid to fight the epidemic in Tennessee.

This ArcMap project measures opiate prescription rates and overdose deaths in 2016 by county to identify trends in geographic, socioeconomic, and/or demographic makeup among victims. A “corners method” (or “queens method”) analysis in ArcMap identified 4 adjacent counties in upper-East Tennessee where prescription rates and overdose deaths are high and inpatient treatment center quantity and capacity is blatantly low. Plotting the locations of inpatient and outpatient drug-addiction treatment centers within this hotspot has effectively created a geospatial analysis demonstrating that this specific area of upper-East Tennessee has an insufficient quantity and capacity of inpatient residential detox and drug-addiction treatment facilities, suggesting a strategic location where a high-capacity inpatient treatment facility would be most effective in helping Tennesseans who suffer the most from opioid abuse.


Data Sources

Poster # 74
Examining the Relationship between Intimacy and Parenting Problems
Conflict among couples can improve or diminish relationship intimacy (Prager et al. 2015). Although parenting is a common source of conflict among couples (Zemp et al., 2017), child-related conflict has yet to be examined in the context of specific relationship qualities such as intimacy although it has been linked with general relationship satisfaction (Linville et al 2009). Theoretically, couples who disagree more about parenting may feel less safe and connected with their partner due to potential frequency of parenting-related discussions. The present study sought to examine intra-individual and cross-partner associations of Parenting Problems [PP] and relationship intimacy. We hypothesized that an Actor’s total PP, and the three subscales, would negatively predict their own, and a partner’s intimacy.

Data were collected from both partners of 43 married (73%) or cohabitating heterosexual couples via local integrative health centers, flyers, and word of mouth. Parenting Problems [PP] and Intimacy were measured using the Parenting Problems Checklist and the Intimate Safety Questionnaire. Data were analyzed using Actor-Partner Interdependence Modeling within multilevel modeling. Results indicated that an Actor’s Total PP negatively predicted their own, but not their partner’s, intimacy. Regarding the PP subscales, open conflict negatively predicted one’s own, but not a partner’s, intimacy. Further, an Actor’s report of the dyad’s tendency to undermine each other’s relationship with children negatively predicted a partner’s, but not one’s own intimacy. Finally, the subscale parental disagreement was not predictive of one’s own, or a partner’s, intimacy. Implications and future research will be discussed.

Poster # 76

**Regulatory Focus and Discrete Emotions in Gaming Situations**

*Taylor Brittni Duncan, Kamilya Aidarovna Gosmanova*

Regulatory focus theory predicts that the type and intensity of emotion people experience depends on if they have a prevention or promotion focus in handling a situation (Higgins 1997). An individual might approach a situation as being a gain or non-loss (winning or not losing in a gaming situation) or loss vs. non-gain (losing or not winning). In a promotion focus, achieving a gain will induce feelings of cheerfulness, while a non-gain will induce feelings of dejection. In a prevention focus, achieving the non-loss will induce feelings of quiescence, while a loss will induce feelings of agitation. Judges looked at video data from 103 participants who experienced all four outcome situations: gain, non-loss, loss, non-gains. Regarding positive discrete emotion, we predict that coders will detect more cheerfulness after gains than non-losses and more quiescence after non-losses than gains. Regarding negative discrete emotion, we predict that coders will detect more agitation after losses than non-gains and more dejection after non-gains than losses.

Poster # 77

**Tennessee Junior 4-H Camp Curriculum: Creating, Implementing, and Evaluating Educational Programming Using Research-Based Practices in Youth Development and Instructional Design**

*Alexis Nicole Hal*

This project shows the process of creating, implementing, and evaluating an interdisciplinary curriculum for junior 4-H camp at the University of Tennessee Extension Clyde Austin 4-H Center in Greeneville, Tennessee. Four lessons were
developed using research-based practices in experiential learning and instructional design, including the Richards Working Model of Curriculum Development and Robert Gagne’s method of instructional design.

During the summer camping season of 2017, 1,184 students learned about Tennessee history and life skills while developing their skills in art, music, science, math, and language arts at 4-H camp. Campers in grades 4-6 learned about Sequoyah’s invention of the Cherokee syllabary, endangered species in the Great Smoky Mountains National Park, Pat Summitt’s leadership as the head coach of the Tennessee Lady Volunteers Basketball team, and the history reflected in the state songs of Tennessee.

Responses from camper evaluations indicate 54% of the sampled population learned from the curriculum, and evaluations from volunteer leaders and 4-H agents indicated frustration with various aspects of the educational sessions. This feedback and practitioner reflections guide future recommendations for future curricula.

Keywords: curriculum development, instructional design, experiential learning

Poster # 78

Do facial expressions influence affective experience? A meta-analysis

Ashley Faith Kuelz, Shichie Joyce Kuribayashi, Nicholas Alvaro

Students’ Department: Psychology Faculty Mentor: Larsen, Jeff T

The facial feedback hypothesis suggests that our facial expressions influence affective reactions. In light of Wagenmakers et al.’s (2016) failure to replicate Strack, Martin, and Stepper’s (1988) seminal demonstration of facial feedback effects, we conducted a meta-analysis on 286 effect sizes derived from 136 facial feedback studies. Results reveal that the overall effect of facial feedback on emotional experience was small but significant (d = .20, p < .000000005). In addition, five standard metrics suggested that these results were not driven by publication bias. Moderator analyses indicated that facial feedback can influence ratings of emotional experience, but may not influence evaluative judgments. Furthermore, facial feedback effects on emotional experience are larger in the absence of emotionally evocative stimuli (e.g., cartoons), and for some emotions (e.g., happiness) than others (e.g., fear). However, a great deal of unexplained heterogeneity in facial feedback effects remains ($I^2 > 70$), and current methods cannot address concerns about the impact of questionable research practices. Nevertheless, the available evidence supports the facial feedback hypothesis.

Poster # 79

Attention-Deficit/Hyperactivity Disorder (ADHD) and Reading Abilities: A Comprehensive Review

McKenzie Martin, Holly Elizabeth Flatt

Students’ Department: Psychology Faculty Mentor: Bolden, Jenn

Attention-Deficit/Hyperactivity Disorder (ADHD), is a neurodevelopmental disorder that is characterized by “a consistent pattern of inattention and/or hyperactivity/impulsivity symptoms that interferes with functioning in at least two domains” (DSM-V, 2013). Extant studies document a number of academic performance impairments in relation to ADHD-related cognitive impairments. While most studies link reading impairments to attention symptoms, Kagan’s (1965) seminal work documents a significant positive correlation between cognitive impulsivity and reading abilities in typically developing school-aged children (Kagan 1965). The purpose of this comprehensive review is to examine ADHD-related reading abilities. We will examine reading abilities broadly and examine specific reading abilities (i.e., reading comprehension and reading decoding) in this review. We will then elucidate the link between reading attention problems and examine the
relation between impulsivity and reading abilities in school-aged children diagnosed with ADHD. The purpose of this literature review is to understand the etiology (i.e., root cause) of impaired reading abilities in school-aged children diagnosed with ADHD. This comprehensive literature review will outline the foundation for research on the relation between reading abilities and children with ADHD. Clinical and research implications will be discussed.

Poster # 80

Emotion Dysregulation Explains the Association Between Borderline Personality Traits and Cyber Dating Abuse Perpetration Among College Students

Meredith Denney

Student’s Department: Psychology

Faculty Mentor: Stuart, Gregory Lyal

Results from self-report, cross-sectional data suggested that college students’ BPD traits are positively related to cyber dating abuse perpetration indirectly through emotion dysregulation after controlling for age and gender. Borderline personality disorder (BPD) consists of traits such as the fear of abandonment, impulsive behaviors and reactions, unstable self-image, and insecure interpersonal relationships (American Psychiatric Association, 2013). Individuals with BPD traits also evidence difficulty regulating emotions in a healthy way (i.e., emotion dysregulation [ED]). ED is recognized as the maladaptive way one responds to emotional conditions, which can be a contributing factor in aggressive behaviors, including dating violence (Donahue et al., 2014; McNulty & Hellmuth, 2008). Prior research has yet to examine the relationship between BPD traits and cyber dating abuse (CDA) perpetration. CDA is defined as the monitoring, harassing, threatening, and/or abusing a dating partner via technology (e.g., smart phones, social media, and e-mail; Borrajo et al., 2015). Results indicated a significant indirect effect of ED ($\beta = .15$, $SE = .09$; 95% CI: [.005, .391]), supporting a model in which ED fully mediated the relationship between college students’ BPD traits and CDA perpetration, $F(4, 249) = 5.42$, $p < .001$. Further research implications will be discussed.

Poster # 81

Role Balance and the Transition to College: A Longitudinal Study

Sara McCurry, Jennifer Lynn Bishop, Ashley Nicole Morris

Students’ Department: Psychology

Faculty Mentor: Welsh, Deborah P

In emerging adulthood, young people learn how to balance their developing individual and relational roles. Past studies on emerging adult college students have used cross-sectional data, making it difficult to explore longitudinal changes in role balance or make causal inferences about data. The purpose of this ongoing study is to explore the relationship between role balance, performance, and psychosocial outcomes during transition to college and to test role balance as a predictor of college success over year one of enrollment. Accordingly, 103 first semester undergraduates were administered a demographic questionnaire as well as several scales pertaining to role balance during the first month of enrollment. A subsample of these students were re-administered these measures during the final two weeks of the same semester and consented to release their semester/cumulative GPA and enrollment status for up to five years. Preliminary analyses suggest that role balance is associated with performance and psychosocial outcomes during the first semester of college and beyond. Results suggest that if this trend continues when performance data is collected at year’s end, balance under conditions of stress may be the most useful predictor of longer term student success outcomes.

Poster # 82
The Impact of Generational Culture on the Perception of Diversity and People in Beer Advertising on Instagram

Daniel N Ford

Student’s Department: Anthropology
Faculty Mentor: Pendry, De Ann

Demographic representation in advertisements is often perceived as a reflection of the overall demographics of a society. However, some industries, like beer, portray an antiquated image of what society looks like by incorporating low levels of both racial and gender diversity. Since Millennials are currently the largest, living generation and almost half of this generation is comprised of racial minorities (Fry 2016; United States Census Bureau 2015), there is a need to understand how Millennials perceive both racial and gender diversity in beer advertising, as well as their cultural understanding of beer in general. Results indicate that, while diversity in ads may not necessarily increase purchase intent, higher levels of diversity successfully prevent feelings of brand alienation among both minority and non-minority consumers. Conversely, however, respondents also stated that the physical environment and situation portrayed in an ad play a stronger role in purchase intent than the actual individuals depicted, regardless of their level of diversity.

Poster # 83

The Effect of Student Loan Debt on Homeownership

Courtney Alexis Cantrell

Student’s Department: Economics
Faculty Mentor: Cahill, Katie

This research examines the relationship between student loan debt and homeownership in the United States. The government emphasizes long-term investments like homeownership through tax incentives, but does not focus on negative effectors like student loan debt. In this article, I hope to identify how student loan debt affects homeownership through multiple ordinary least square (OLS) regressions. I obtained the data for the project from the Panel Study of Income Dynamics (PSID), specifically the Transition to Adulthood Study (TAS). The TAS surveys children of families involved in the PSID from ages 18-32, and offers biannual data ranging from 2005 to 2015. I ran three OLS regressions for each of the years, 2007, 2009 and 2011 with homeownership as the dependent variable and student loan debt as the independent variable. I included other control variables including race, education level and employment status. Based on previous literature, I hypothesize that higher student loan debt will lower the likelihood of homeownership. I hope that this research will help policymakers understand the effect of student loan debt on the long-term decisions of those who hold it and show policymakers how creating policies to lower this debt will lead to other social benefits.

Poster # 84

The Livability of Shakespeare’s London

Reagan Autumn Yessler

Student’s Department: Geography
Faculty Mentor: Foresta, Ronald

Using a modified version of the currently used Economist Intelligence Unit Global Livability Report, I will measure the livability of London during the lifetime of William Shakespeare (1564-1616), using both qualitative and quantitative historical data, and reaching a final quantitative measure of livability. I will measure five broad criteria categories: stability, healthcare, culture/environment, education, and infrastructure. I will eliminate criteria based on their anachronisms with the period; thus, criteria such as public healthcare, level of
corruption, public education indicators, telecommunications, international links, and energy provisions must be eliminated or reconfigured, as they did not exist in early modern London as they do now. In keeping with the view that this report should be measured by the standards of the time, not by modern ones, views on the value of child labor and other such contemporarily illegal acts will be judged based on the historical context. Reflecting the number of sub-criteria, stability will constitute 25% of London’s livability, healthcare 15%, culture/environment 35%, education 10%, and infrastructure 15% of the overall livability score. Scores will be broken down into 20 point increments, with scores of 80-100 points reflecting ideal livability, and scores of 50 or less will reflect severely restricted living.

Poster # 85

The Spatial Migration Patterns of younger versus older adults and educated versus non-educated adults in Tennessee

James Michael Smith

Student’s Department: GeographyFaculty Mentor: Nagle, Nicholas

While some parts of Tennessee are seeing rapid growth in population, other parts are not. Where people move to can explain trends that are helpful for planning processes, especially if it’s a particular age group or education group. The purpose of this research project is to display, study, and compare the geographical migration patterns of adults who moved to Tennessee in 2016. I look especially at the differences between where young adults and older adults are moving, and the differences between where more and less educated people are moving. In the case of young adults who have earned at least a bachelor's degree, where they move to can reflect the strength of local economies especially if they are moving in clusters. Data for the year 2016 on population, age groups, income, and migration patterns for all levels of education is collected from the US Census Bureau using R-Studio software. The data was then imported into ESRI: ArcGIS in order to display the data in the form of maps. The maps illustrate the migration patterns of young adults based on different levels of education, the ratio of educated migrants versus uneducated migrants, the ratio of all migrants versus total citizens, and median household incomes by census tract in Tennessee for comparison purposes.

Poster # 86

Refugee and Terrorism: An Empirical Analysis of Refugee Flows and Domestic and Suicide Terrorism

Gabriella Nicole Laros

Student’s Department: PhilosophyFaculty Mentor: Sharma, Hemant Kumar

We examine the relationship between incoming refugee flows and domestic and suicide terrorism. After controlling for factors that scholarship has found relevant for explaining terrorism, we find that incoming refugees led to an increase in domestic terrorist incidents from 1970-1997, but refugee inflow neither increased nor decreased the number of domestic terrorist incidents from 1998-2012. We also find that refugee inflows have no statistically significant impact on suicide terrorism in the host country over the years 1982-2012. Moreover, when our analysis is partitioned to examine developed and non-developed countries, we find that in OECD nations there is no increased likelihood of domestic terrorism for any of the temporal domains investigated. This may indicate that a country’s ability to provide for refugees -- perhaps through basic economic, political and religious freedoms -- could be relevant for minimizing the likelihood of terrorist incidents in the host country.
Poster # 87

The Power of Representation: The Role Latin American Female Heads of State in the Reduction of Gender Based Violence

Adriana C Ortega

Student’s Department: Political Science
Faculty Mentor: Wilford, Allan Mark

Utilizing the framework of the double-bind dilemma of women in leadership, this report investigates the role of female heads of state in Latin American nations in the implementation of successful public policy to reduce gender based violence. As the theoretical basis of this study, the double-bind dilemma is a discrepancy within communication during which one actor receives two contradictory messages, with one action often negating the effectiveness of the other. Regarding the example of Latin America, this region has seen some of the world’s most progressive political reform regarding gender representation, with 11 countries adopting legislative quota laws and 6 total nations electing women to serve as their president. However, 14 out of 25 countries known for high rates of gender-based violence are located in Latin America, in addition to an enduringly high prevalence of misogynistic attitudes and rampant economic inequality for nearly half of women in the workforce. This issue cultivates a difficult political landscape to navigate for female leaders who are tasked with satisfying constituents along with protecting their most vulnerable populations, thus creating a double-bind dilemma. This report comparatively analyzes the terms of four Latin American female presidents and three legislative bodies with varying levels of female representation in their efforts to curb the impact of gender-based violence.

*this is a classroom project

Poster # 88

Gender Role Beliefs and Emotion Dysregulation as Risk Factors for Dating Abuse Perpetration Among College Men in Southern Appalachia

Dana Conzemius

Student’s Department: Psychology
Faculty Mentor: Stuart, Gregory Lyal

Endorsement of traditional sex role expectations (TSRE; i.e., male dominance over the relationship) is a risk factor for men’s intimate partner violence (IPV) perpetration (Anderson, 2005). However, less research investigated protective factors for IPV among such men. Emotion regulation (i.e., awareness of emotions; Gratz & Roemer, 2004) can be a protective trait for IPV (Ortiz et al., 2015). We investigated whether emotion regulation moderated TSRE and psychological IPV among college men in southern Appalachia. We hypothesized that TSRE would positively associate with psychological IPV among men with poor emotion regulation skills.


Hierarchical regression analyses using the PROCESS macro for SPSS tested emotion regulation as a moderator between TSRE and psychological IPV. The model was significant; the addition of the interaction term explained significant variance in psychological IPV scores, F(3,128) = 9.48, p < .001. The interaction indicated TSRE positively related to psychological IPV among men with fewer (B = .58, p < .001), but not greater (B = .05, p = .77), emotion regulation skills. These preliminary results suggest that having abilities to regulate affect may reduce men’s risk of psychological IPV, even in the context of high TSRE.
Poster # 89

The Harmful Effect of Gender Priming on Quantitative Problem Solving in Females

*Eric Zayas Jr., David Scott March*

Students’ Department: Psychology  
Faculty Mentor: Olson, Michael A

In this research we sought to determine if subtly priming women with gender causes them to perform worse on quantitative reasoning exercises. Priming the mind means to passively increase the accessibility of a concept through brief exposure. According to theories of behavioral priming, subsequent unconsciously accessed memory of the exposure will lead to prime-consistent task performance. Women are stereotyped as being relatively poor at math, so a gender vs nongender prime would cause them to do relatively worse at math related tasks. To test this hypothesis, female participants were given a word fragment completion task where words on one version were mostly female gender related (gender primed condition), and words in the other version did not pertain to gender (control condition). After the task, participants were asked to complete the quantitative (i.e. math) portion of the GRE. We found that women in the gender salient condition scored a mean of 13.28 (SD = 3.81) and those in gender non-salient condition scored a mean of 14.90 (SD = 3.50). This supports the hypothesis that priming can affect behavior (i.e., a type of stereotype threat), consistent with theories of behavioral priming. It also has applied implications for education in fields with gender disparities (e.g., STEM).

Poster # 90

Generalizing across speaker and gender during early word learning: Evidence from a statistical learning paradigm

*Madison Newsom*

Student’s Department: Psychology  
Faculty Mentor: Hay, Jessica Sari

Before children can speak, they can track the likelihood that two syllables co-occur to pull words out of a continuous stream of speech. Previous research with 17-month-olds has suggested that words that have high co-occurrence statistics (i.e., high transitional probability, HTP) make better object labels than words with low transitional probability (LTP). Here we test whether infants can generalize the patterns tracked in a continuous stream of speech to a novel speaker and gender. Infants are familiarized with an Italian corpus produced by a female speaker, that contains both HTP and LTP words. Following familiarization, infants are trained to pair HTP words with novel objects. The HTP words used during test where either produced by the same female speaker as during familiarization, a novel female speaker, or a novel male speaker. If infants recognize the HTP words when produced by a novel speaker, they should readily learn to map these words onto novel objects. The ability to generalize across speakers and genders is an important ability during early language acquisition.

Poster # 91

Women in Elected Office

*Keeley Michaela Shea*

Student’s Department: Economics-Arts & Sciences  
Faculty Mentor: Cahill, Katie
Does including women in one position of power increase their presence in another position of power? To answer this question, this study examines the relationship between the inclusion of women in the United States military and their subsequent election rate into Congress. Despite comprising 50 percent of the population, women are underrepresented in our democratic framework as men prevail in public office positions of power. Many factors hinder women’s pursuit of congressional election. These difficulties are accounted for and utilized as control variables in a time series regression, while percentage of women in each of the United States Armed Forces’ branches over time are examined as independent variables affecting the subsequent percentage of women holding US congressional seats in the House of Representative and the Senate. Comparisons of percentage trends of women in congressional seats held and military personnel employed before and following the passing of laws giving women more access to military positions are made to shed light on the effects of the inclusion of women in positions of power.

Poster # 92

Rape Myth Acceptance and Alcohol-Related Expectancies as Predictors of Sexual Assault Perpetration

Mikaela Rae Trussell

Rape myth acceptance (RMA; i.e., attitudes and beliefs supportive of sexual assault) is positively associated with sexual assault perpetration (Mouilso & Calhoun, 2013). Within RMA, there is a perception that alcohol use decreases culpability for perpetrators (McMahon & Farmer, 2011; Lambert & Davidoff, 2012). Expectations regarding the outcome of alcohol use as it relates to sexual behavior increase the likelihood of drinking and sexual behaviors (Jones et al., 2001). This study sought to examine if RMA, along with alcohol-related expectancies, are related to the perpetration of sexual assault. Data collection included 273 undergraduate college students. Measures included The Illinois Rape Myth Acceptance (Payne et al., 1999), the Alcohol Expectancies Regarding Sex, Aggression, and Sexual Vulnerability Questionnaire (Abbey et al., 1999), and the Revised Conflict Tactics Scale (Straus et al., 1996). Multiple regression analysis showed RMA and alcohol-related expectancies were significantly associated with sexual aggression perpetration, R2 = .10, F(3, 273) = 10.133, p < .001, with alcohol-related expectancy of sexual drive (β = .33; t = 3.67, p < .001) and RMA (β = .17; t = 2.90, p < .01) contributing unique variance to the model of sexual aggression. Implications will be discussed.

Poster # 93

Environmental Racism: Flint Water Crisis

Aya E Barnes

In this case study, I look at Flint, Michigan’s state and city officials’ management in relation to their race and class bias during the Flint Water Crisis. Their bias, although covert, caused permanent harm and damage to the health of many of their residents. Their bias ultimately deprived several poor minority residents of a basic human right-water. Among several years, many residents were without water while others were poisoned by the corrosive Flint River that state officials claimed would be safe. How did race and class bias play out in state officials’ management of the Flint Water Crisis?

Drawing on 6 government-issued advisories, 50 emails made publicly available from the lab director of the Michigan’s Department of Environmental Quality, and historical research, I argue that the management of the crisis was handled through a white racial frame that negatively impacted a majority-black city with territorial stigma. Emergency
management, biased decisions, and inaccessible resolutions emerged from the white racial frame which allowed environmental racism to dismantle the public health of an entire city.

Poster # 94

The Department of Environmental Quality’s Role in Impression Management During the Flint Water Crisis

Haley E Boles

Student’s Department: Sociology

Faculty Mentor: Cable, Sherry

The citizens of Flint, Michigan have been at a disadvantage for decades, even before the water crisis. After Flint switched their water source from the Detroit Water System to the Flint River in April 2014, its citizens began to complain about foul-smelling, discolored, and contaminated water. However, complaints were ignored until Dr. Mona Hanna-Attisha revealed an increase in Flint children’s blood-lead levels at a press conference in September of 2015. After the crisis became public, Governor Rick Snyder released ninety-nine PDF files containing emails from the various government agencies involved.

Drawing on an email archive constructed with fellow undergraduate researchers, I compare a sample of 100 emails from the Department of Environmental Quality (DEQ) to 75 public statements from the DEQ. I aim to uncover first, how did the DEQ engage in impression management during the Flint Water Crisis and second, did they prioritize their image over water quality and citizen safety? I apply Irving Goffman’s theory Dramaturgy (1956) to show how the DEQ engaged in public impression management and private "normalization of deviance”

(Vaughan 1996). This study will show how competing concerns of citizen health, financial interests, and public relations were weighed in handling the developing crisis and aftermath.

Haslam College of Business

Poster # 95

Lethal Water Switch: A Matter For Criminology

Jordan Ashleigh Kaset

Student’s Department: Sociology

Faculty Mentor: Presser, Lois

As of today, 5 people have been charged with manslaughter, among a total of 15 given various other criminal charges as a result of the water crisis in Flint, Michigan. Using 334 files downloaded from internal government documents and email conversations made publicly available, this case study uses a qualitative content analysis to corroborate evidence behind the Nick Lyon manslaughter charge in order to investigate in what ways the role of an organization is contained behind a criminal charge imposed on a specific person. When studying the history and series of events that led up to these convictions, an organizational structure supporting each of these officials charged must be recognized to explain how this type of “crime” happened. When a legal water switch results in killing over a dozen people, is it a concern for criminologists? To understand crime as a construct, it should be operationalized according the context being studied. Using green criminology and various literature, I examine how crime is or is not operationalized. How do you hold a long strand of people’s actions accountable? This framework assesses what I argue is the largest problematic component in this case: translating criminal law to control dangerous environmental activities.
Poster # 96

The Impact of Regulation on Firm and SEC Behaviors

Gilbert Alexander Gilchrist

Student’s Department: Accounting

Faculty Mentor: Chyz, James Anthony

I sampled quarterly and annual reports surrounding the Compliance and Disclosure Interpretations (CDI) update on May 16, 2016. This was cross referenced against comment letters received during the same period to test the hypothesis that both the SEC and firms may change behaviors following new reporting regulations. In particular, this paper focuses on non-GAAP earnings as an optional feature of reporting that was significantly affected by the CDI update. I found that no significant change in firm behavior existed on an aggregate level, although the SEC notably increased scrutiny of non-GAAP measures as measured by the rate at which firms using non-GAAP metrics received a comment letter mentioning their metric. Firms using a metric based on Net Income may have been more affected due to specific regulations surrounding tax adjustments. More data observing firm behavior could show a change in subsequent years.

Poster # 97

Auditor-Provided Tax Services and Audit Quality: Insights from Tax Comment Letters

Terence Ryan Williams

Student’s Department: Accounting

Faculty Mentor: Cunningham, Lauren Marie

Services provided by an auditor that are not directly related to the audit (“non-audit services” (NAS)) have been a highly investigated research topic since the Sarbanes-Oxley Act of 2002 came into effect. Two conflicting theories have been presented in the prior literature: 1) that NAS can improve audit quality based on spillover of knowledge from the NAS, or 2) that NAS can impair audit quality based on concerns of independence and over-reliance on fees generated from NAS. In this study, I examine the effect of a specific type of NAS, auditor-provided tax services (APTS). Previous tests on the impact that APTS has on audit quality using measures such as accounting restatements, likelihood of a material weakness in internal control, and tax reserve patterns, have found conflicting evidence. I contribute to these studies by being the first to examine the relationship APTS has with the probability of receiving a tax-specific comment in a U.S. Securities and Exchange Commission (SEC) comment letter. Researching thousands of company-years of audit fee information and comment letter details, I find that even the slight use of APTS largely increases the probability of receiving a tax-specific comment letter (TCL). Specifically, I find a non-linear relationship between the proportion of APTS and probability of TCL, such that when less than one percent of total fees are from APTS, on average, 15 percent of company-years receive a TCL. In contrast, when more than one percent of total fees are from APTS, on average, 24 percent of company-years receive a TCL. I then investigate whether there are company characteristics affecting both the proportion of APTS and the probability of a TCL (i.e., correlated omitted variables).

Poster # 98

Powlis Cleaning

Steven J Powlis

Student’s Department: Accounting

Faculty Mentor: Graves, Tom
This poster will be about a new company that Steven Powlis hopes to grow. The company cleans bars and restaurants. The company has ways of competing with their competition by offering services that are hard to replicate. They will use green products with less chemicals and UV lights to ensure that there is less residue. They have several partners and employees who have worked in the restaurant and bar business who know how to maintain cleanliness and pass health tests. The poster will also go into the financials and just how practical this business can be.

**Poster # 99**

**Evaluating Quality Score of Google AdWords**

*Thao Phuong Tran*

Student’s Department: Business Analytics

Faculty Mentor: Ballings, Michel

Many companies are using advertisements (ad) on Internet searching service sites to promote their products and reach potential customers for their business. Non-profit organizations can use online advertising services to raise public awareness, recruit more volunteers and attract donations. One of the most popular online advertising services is Google AdWords. Its role is to order ads on search result pages and to determine advertising fees by running an auction for every keyword. The bid for cost per click (CPC) and quality of ad (Quality Score) will decide the ranking of the ad. High quality ads have higher chances of getting selected to display with better positions and lower prices. The quality score summarizes recent performance based on three main components: expected click-through rate (CTR), ad relevance and landing page experience. However, we do not know the algorithms behind Google AdWords calculates the quality score. By knowing the algorithm, companies can obtain better ad ranks. In this research, we will evaluate an efficient method to compute the quality score. The contribution of our research is to clarify the quality score algorithm, help advertisers improve their ads and reduce advertising prices on Google.

**Poster # 100**

**Financial Alignment on Physician Performance**

*Joseph Neal Trice*

Student’s Department: Accounting

Faculty Mentor: Bichescu, Bogdan Cristian

In a post-reform healthcare market, collaboration between hospitals and their physicians is critical to success. The recent incentives put in place by lawmakers are the reasons for the recent growth in financial alignment among physicians and hospitals. This alignment allows for risk and profit sharing between the physician and the hospital it works at, further driving the physician towards more cost-efficient, quality care as well as a deeper alignment with the hospital’s overall goals. This reform of how hospitals contract out their premium labor can be seen in practice by the number of innovative strategies hospitals have executed (i.e. dyad management, financial-alignment initiative plans), but there seems to be a gap in this matter between the literary research and practice. While there are many other benefits for hospitals to financially align their physicians such as market share growth, best practices absorption, management of administrative overhead, etc., this study aims to look at the differences in how physicians provide care across hospitals and in turn, how hospitals should look at hiring the foundation of their organization. Leveraging secondary, patient-level data from the HCUP database, we have created case profiles for the physicians and hospitals. Using regression modeling techniques, we attempt to compare these case profiles to various patient outcome quality metrics to provide guidance to practitioners on how to contract out their premium labor. The results from this study provide important implications for how physicians and hospitals should look at collaboration.
Poster # 101

Melton Research Presentation

Nainika Sudheendra

Student’s Department: Supply Chain Management
Faculty Mentor: Willems, Sean Peter

A fundamental problem facing companies today is demand forecasting for new products. When product life cycles are short and product generations overlap, it can be difficult to determine whether forecasts for previous generations of products are useful for the subsequent product generation. This research focuses on understanding the similarities and differences between three generations of Intel microprocessors, with the goal of determining what new products can be mapped to previous products, and whether that mapping is at the geography, facility location, or product level.

Poster # 102

Market Basket Sampling with Co-purchase Correlation

Elizabeth Nicole Nichols

Student’s Department: Statistics
Faculty Mentor: Zhou, Wenjun

The objective is to assess the impact of co-purchase correlations on sales and leverage it for prediction. We focus on point-of-sales data from a retailer where each transaction is a ‘basket’ consisting of items purchased.

First, we will test whether co-purchase correlation is worthy of consideration. We split the data into a randomly chosen week’s data as the hold-out set, and the remaining weeks as the training set for identifying co-purchase patterns. Then, we simulate baskets utilizing two different methods: assuming independence among items and considering co-purchase correlation. The simulated baskets are compared to the hold-out to see how close they resemble the actual. Our hypothesis is the correlated version will provide a more realistic simulated sample than the independent approach.

Then, we will simulate baskets data under various promotion scenarios for marketing decision support. For a pair of items, we will partition the training set into subsets depending on their promotion status. Correlation patterns will be extracted as input for the simulator, generating multiple samples for us to estimate the effect of various marketing scenarios. We will then be able to make recommendations about the promotions of the two items and help better determine shopper behaviors under various promotions.

Poster # 103

The Pricing Impact of Decreasing Competitiveness of the Health Insurance Market

Lauren Nicole Patterson

Student’s Department: Economics
Faculty Mentor: Harris, Matt

The Affordable Care Act created the national insurance exchanges to encourage a higher insured rate, larger risk pools, and lower prices (KFF, 2012). This research analyzes the impact of changes in competition between health care insurers on the individual exchange market on the premium price of the end consumer. This research also attempts to identify the effectiveness of these exchanges on keeping insurance prices low. Past research has found that insurer consolidation
decreases market competition and increases prices (Dafny, 2015), so this study builds upon and updates the past analysis to look at how insurers leaving a set market, for any reason, changes pricing. This research uses a first differences regression model of prices of insurance plans sold on the QHP Landscape SHOP Medical Market through Healthcare.gov. This method allows us to study the relationship between changes in the number of plans sold, controlling for several other variables, and changes in price year of year from 2014 to 2017.

Poster # 104

State Aid: How Economic Development Trumps Tax Revenue

Kristen Leigh Purcell

Student’s Department: Accounting
Faculty Mentor: Luna, Leann

European state aid exists when European Union (EU) member states give preferential treatment to companies, which often results in massive company-specific tax breaks. The European Commission’s (EC) recent uptick in investigations into a tax-related state aid cases in different EU member states has created a spotlight on the issue of state aid. Many US multinational companies have been in the press because of these investigations, including Amazon, McDonald’s, Apple, and Starbucks. This research paper analyzes three different state aid cases: Apple and Ireland, Starbucks and Netherlands, and Belgium’s Excess Profit Scheme (which affected 35 companies). The analysis of these three cases is to focus on the danger of ‘economic development’ activities and how governments compete for business in regard to their tax policies. This paper analyzes the tradeoff that exists for countries participating in illegal state aid regarding tax policy between lost tax revenues and foreign investment/economic development. It also analyzes how the U.S. corporate tax rate affects these companies in regards to foreign investment and how the size of U.S. multinationals provides an incentive for these countries to pass attractive tax law. Lastly, this paper discusses how state aid will affect the international tax planning of multinational companies.

Poster # 105

The cost of child care and its effect on female labor force participation.

Richard Joseph Goyette

Student’s Department: Economics
Faculty Mentor: Compton, Benjamin Hasty

The purpose of this study is to examine the effect that the cost of child care has on the labor force participation of women, with an emphasis on the effects on single mothers, in order to help direct policy initiatives to alleviate the growing proportion of women who are poor, more commonly known as the “feminization of poverty”. Labor force participation is affected by race, income, marital status, number of children, and other demographic/labor/income variables. Data used for this study was collected in the Panel Study of Income Dynamics (PSID). This study uses regression analysis to determine the relationship that the cost of child care has on labor force participation, while controlling for all the previously mentioned variables, from the years 1999-2015, using data at the family level to determine this relationship. Due to the nature of the data collected, a pooled cross-sectional analysis is the choice of method, accomplished by grouping the observations by their years and assigning dummy variables for each year.
Poster # 106

Does Winning Eurovision Impact a Country's Economy?

Kendall Elise Bard

Student’s Department: Finance Faculty Mentor: Holladay, James Scott

The purpose of this thesis is to explore the relationship that winning Eurovision has on several different economic metrics in a particular country. Drawing between 100 and 600 million viewers every year, The Eurovision Song Contest is the longest—running televised singing competition in the world, and has occurred annually since 1956. Furthermore, Eurovision is the most popular international televised event, other than sporting events such as the Olympics and the World Cup. Despite this, limited research has been completed on Eurovision’s economic impact specifically. For this thesis, data on various economic indicators was collected through the World Bank’s World Development Indicators database from 1960 through 2017, for all countries that have either won or hosted the contest (a total of 26 unique countries). Regressions were then completed using Stata to show statistical significance between winning/hosting the competition and a country’s economy.

Poster # 107

The Trump Effect on the Health Care Sector

Chrisse Lam

Student’s Department: Finance Faculty Mentor: Cole, Laura Seery

Numerous studies have analyzed the impact of a presidential election on the financial markets. This study explores the effects of the announcements of Donald Trump’s candidacy, republican nomination, and election victory on health care sector stocks. Using the event study methodology, I look for trends of abnormal stock returns around these dates. I also observe two subgroups in the health care sector: biotechnology & pharmaceuticals and medical equipment & health care services. I find that stock returns are positive for the biotechnology & pharmaceuticals subsector, and stock returns are negative for the medical equipment & health care services subsector. These results are likely due to the potential reversal of the Affordable Care Act and the decreased focus on controlling drug prices under the Trump administration.

Poster # 108

Hurricane Matthew:

Measuring the Stock Market Reaction on the Insurance Industry

Gregory Douglas Gilbert

Student’s Department: Accounting Faculty Mentor: Cole, Laura Seery

Purpose:
The purpose of this study is to investigate the stock market reaction on the insurance industry by Hurricane Matthew in 2016.

Scope:
This study uses the S&P Insurance Select Industry Index (S&PINS), which is a collection of 47 insurance companies, to represent the overall insurance market. These insurance companies represent all sub-industries within the insurance industry as well to diversify the potential returns.

**Methods:**

This study utilizes Eventus via WRDS to analyze the data using historical stock market data and calculate cumulative abnormal returns (CARs) using 4 different models.

**Results:**

Hurricane Matthew shows statistically significant results through multiple event windows on the insurance industry. The results show positive CARs due to the overwhelmingly early warnings of Hurricane Matthew striking Florida with Category 4 strength, when it eventually landed in the US with only Category 1 strength.

**Poster # 109**

**The Next Recession: Is it Time?**

*Samuel Wallace Paganelli*

Student’s Department: Accounting

Faculty Mentor: Cole, Laura Seery

The Great Recession of 2008 left millions of people without homes, and trillions of dollars in savings were wiped out. As well-informed individuals, we know the economy is cyclical in nature, but how could something so severe happen so suddenly? Were there warning signs that were missed? In my project, I attempt to answer these questions before the next recession. The average business cycle is approximately 6 year long, and the United States is currently in its 9th year of economic expansion. This fact alone has many people worried that a downturn may be imminent. The goal of my project is to take a holistic view of the health of the United States economy but do so in a way that is simple and easy to understand for the average person. A recession is defined as “A period of temporary economic decline generally identified by a fall in GDP in two successive quarters”. Because of this definition, I will tie every indicator I look at back into how it affects GDP in the United States. Some of the leading indicators I will focus on are the stock market, bond market, corporate earnings, consumer spending, production, and consumer sentiment.

**Poster # 110**

**What Makes Us Happy? A Deep Dive Into Subjective Well-Being and its Cultural Provenances.**

*Adam Gerald Impellizzeri*

Student’s Department: Supply Chain Management

Faculty Mentor: Adeleye, Ifedapo Lanrewaju

Recently, the discussion of happiness has made its way into the light of psychology as a term known as “Subjective Well-Being.” I examine factors such as wealth, personal motivation, individualism, cultural values, and language differences between nations with the goal of determining exactly what effects subjective well-being. After taking a deep dive into examining the current research on the topic, I am able to corroborate both the findings of certain subjective well-being studies and economic models of utility by collecting secondary data. Based on my findings, I continue on to propose a theory which attempts to explain the most important influencers of this incredibly subjective measure of human behavior.
**Poster # 111**

**Paid Maternity Leave in the United States: What's the Holdup?**

*Emeline G Brown,*  
Student’s Department: Supply Chain Management  
Faculty Mentor: Barksdale, Cheryl

In the United States, women are increasingly more educated but lack the long-term workforce representation that would indicate such a transformation; the Bureau of Labor Statistics predicts a decline in the labor force participation rate for women over the next ten years (BLS.gov, 2017). While women are still considered primary caregiver in the majority of American households, data demonstrates that women have the desire to continue expanding their roles outside of the home through participation in the workforce (DOL.gov, 2013; Parker & Wang, 2013). However, labor force turnover for women within the first year of having a child hovers at 33.3% (Day & Downs, 2009). To ensure women’s continued workforce participation, U.S. laws and corporate policy must offer greater flexibility and employer support for families. At present, the Family Medical Leave Act (FMLA) is the only explicit form of maternity leave protection for working American women. However, the FMLA does not require employers to replace employees’ lost wages during parental leave. Unpaid family leave reduces women’s employment opportunities in the labor market while paid family leave is linked to smaller differences in workforce participation and productivity on the job (Boeckmann, Misra, & Budig, 2015). The United States is now the last of its peers to devote federal resources to paid family leave. This paper serves to outline existing literature discussing maternity leave policy in the United States compared to other world powers that guarantee paid family leave for citizens. Current trends in the labor market will be discussed to understand the economic impact of paid maternity leave in the United States. More recent developments to expand federal family leave benefits will also be presented. In sum, this paper seeks to review existing information about U.S. family leave policy while answering the question: where should paid family leave in the United States go from here?

**Poster # 112**

**FoodScape Knox**

*Caroline Beth Conley,*  
Student’s Department: Business Analytics  
Faculty Mentor: Graves, Thomas Houston

My capstone project is a completed business plan for a LLC company named FoodScape Knox. FoodScape Knox is a social enterprise whose aim is to build the local food economy and fresh food access within Knoxville. Foodscape Knox offers edible landscape design and installation to private landowners. For every landscape installment completed, another edible landscape is installed for free in a low-income neighborhood. The uniqueness of our service offered as well as the effort towards community development will act as the primary competitive advantage. In the long run, Foodscape Knox will start offering edible landscaping services to businesses and schools. We dream of a world that is sustainable and healthy, a world where there is collaboration and unity between neighborhoods, where nutritious food is accessible for everyone. Convinced that the changes needed on a global scale must be initiated at the local level, we are working to develop an ecological and accessible agriculture, adapted to the urban context. One garden at a time, we change our living environment, promote biodiversity and produce fresh, healthy and ultra-local food.
Poster # 113

The Executive Insider Business Plan

William Barnette

Student’s Department: Economics  Faculty Mentor: Graves, Thomas Houston

Have you ever wanted to read a story from a young startup company’s founder about what he/she has learned in getting their company off the ground? What about the lessons a young associate learned after making their first big mistake in industry? What about the story behind how a single phone call from a friend convinced Mr. Jimmy Haslam to buy the Cleveland Browns? There isn’t a single company or publication that is taking stories like these from business people, across all different sectors and levels in industry, written directly by the source and putting them in one place; until now.

In this undergraduate thesis, Will Barnette, under the advisement of Tom Graves, presents the business plan for The Executive Insider, delivering stories directly from business leaders. The Executive Insider aims to get articles and stories written in the first person by people in all sorts of different businesses and publish them via email newsletter and website. This business plan includes detailed financial and growth projections, marketing and operational plans, and more. Join us in completing our goal of equipping people across the world with stories from successful people’s past to better prepare our readers for the future.

Poster # 114

Free For The Fort

William David Trapnell

Student’s Department: Accounting  Faculty Mentor: Graves, Thomas Houston

Free for the Fort is a delivery company designed for college students. We specialize in fast and efficient bicycle delivery of food and groceries to students within a two-mile radius of the campus. We collaborate with the University to create an online platform that allows students to utilize their university meal plan or their own money to pay for the order. We realized that there is a need for a delivery service specific to college students. Free for the Fort is a company that fills that gap by offering students the fastest and cheapest on-campus delivery right to their door. Currently, we are located at the University of Tennessee, Knoxville. We have plans to expand to other campuses that have similar campus layouts as UTK.

Poster # 115

Obtaining and Sustaining a Competitive Advantage Through the Customer Experience

Elaine Tyler Greenfield

Student’s Department: Supply Chain Management  Faculty Mentor: Miller, Alex

I have been researching how businesses, specifically small, locally owned retail businesses, can obtain and sustain a competitive advantage over others in the competitive retail environment. Due to the growth of online shopping, this is an industry that has drastically changed over the past several years. 2017 was known as the “Retail Apocalypse.” In my research, I have found that creating a meaningful in-store experience for customers is very valuable and can create a sustainable competitive advantage for retailers. I have presented this research in the form of a Case Study about a small retail business located in East Tennessee.
Poster # 116

Can Retail Consumerism Help To End World Poverty?

Madison Grace Hamilton

Student’s Department: Finance
Faculty Mentor: Miller, Alex

I have been conducting research in the form of a case study on a retail startup called Fashionable that was originally founded to help Ethiopian women recovering from life in the sex-trafficking industry. I have been exploring the different consequences - both positive and negative - of their decision to transition from a non-profit to a for-profit company several years ago. Many of the resulting products from this transition have become very competitive in the retail environment forcing Fashionable into a shift from having their primary focus and impact on Ethiopian rehabilitated women to women in developing countries in general. I am exploring the opportunities, impact, and difficulties that arose from this shift as Fashionable entered the fast-paced, high-risk world of retail in full force attempting to both maximize their shareholders’ value and create sustainability in developing nations around the globe.

Poster # 117

How do fast food retailers translate domestic brand and reputation as they expand internationally: Promises and pitfalls

Margaret Elizabeth Potent

Student’s Department: Business Analytics
Faculty Mentor: Smith, Anne

When a firm expands beyond its domestic market, it is caught in a tension between offering standardized products and services while also responding to local market conditions (Bartlett & Ghoshal, 1986). When a service-oriented company, like a fast food retailer, decides to expand abroad it reflects this tension between appealing to new market conditions and maintaining processes, products and standardized service on which its reputation has been built.

In this thesis, we examine fast food retailers who have either succeeded or failed abroad and analyze the extent of modification to its brand and operations in that country. The thesis then highlights the history of Chick-fil-A, a fast food retailer with a very strong brand domestically. Chick-fil-A’s brand is so strong that it closes on Sundays and is willing to lose sales at the cost of adhering to its values. Based on the analysis of the studied fast food retailers, we will provide suggestions to consider when globalizing a strong brand.

Poster # 118

Batter Up

Brennan Grace Galbraith

Student’s Department: Supply Chain Management
Faculty Mentor: Youngs, Lynn

Batter Up is a one of a kind breakfast restaurant that is going to keep you coming back for more. It is a restaurant that offers a unique, innovative dining experience to the Knoxville community. There is an overarching problem is that restaurants are not keeping up with the innovative technology. We are solving the problem by providing our customers with a one-of-a-kind dining experience to personalize your breakfast offering. Through advanced 3D printing technology
combined with a passion for pancakes, Batter Up is able to create a pancake with any design that a customer could want. From an Eiffel Tower pancake for a romantic breakfast to a pancake with your selfie on it, Batter Up is here to provide.

Batter Up will be located in the up and coming south waterfront district of Knoxville, TN. We will be targeting our customers first by psychographics, focusing on those who seek the importance of innovation that emphasizes customer’s experience. As this group tends to be the millennials and families with young children, we will ensure that we are providing them with an offering unlike anything else in the market.

Poster # 119

Pick Up n’ Play: Changing the World of Pick-Up Sports

Kevin Alec Canfield

The purpose of this business plan is to build an app for pick-up sports that aspires to create a niche identity in a heavily saturated, yet underutilized market. Pick Up n’ Play aims to organize communities everywhere through various, recreational sporting activities. The power of sport connects people regardless of race, religion, or creed and is a unifying force unlike any other. Through the guidance of my advisor, Lynn Youngs, I have been able to craft a unique market penetration strategy in this business plan that will allow Pick Up n’ Play to differentiate itself in such a crowded market. This strategy relies upon corporate and community partnerships, social media presence, and grassroots/word-of-mouth exposure. Revenue for the company will largely come from advertising placements in the app, with supporting revenues coming from corporate and community partnerships. Initially, Pick Up n’ play will target college campuses and frequent movers, focusing in on two demographics that can struggle to find consistent communities to be a part of due to strenuous and varied lifestyles. After such groups have been solidified, Pick Up n’ Play will expand into larger, more diverse demographics. Pick Up n’ Play is ready to take off, are you ready?

Poster # 120

Hearth and Home, Renovation & Design L.L.C.

Chelsea Erin Schulz

Hearth and Home Renovation and Design, LLC is a real estate investment, renovation and home design company serving the greater Nashville Area market. Hearth and Home acts primarily in the following three industries: real estate, flipping/renovation, and design. Through synergistic actions across all of these industries, Hearth and Home delivers superior customer value to home-buyers. Hearth and Home has identified several strategic competitive advantages which are found through key partnerships, design and brand equity. Key partnerships will lead to mutually beneficial cost efficiencies. Design will create distinction and opportunities to retain customers longer than competitors. Brand equity will be built through a sophisticated content-driven marketing campaign; these marketing efforts address a gap in the market and serve as a differentiator among competitors. Through each step of the process, the Hearth and Home brand represents superior quality. This is recognizable not only in the quality of construction and design efforts, but also in the customer service delivered during each and every interaction.
Poster # 121

Holistic Health Solutions - Business Plan

Sophie Ellen Lange

Student’s Department: Economics

Faculty Mentor: Youngs, Lynn

At Holistic Health Solutions, dieting is not part of our vocabulary. We believe in a positive, holistic approach to health that incorporates fitness, nutrition, and lifestyle changes. The health and wellness industry is growing rapidly as individuals become eager to reap the benefits of a healthier lifestyle. However, starting the journey towards a healthier lifestyle is difficult and even harmful without the correct resources. My business plan describes Holistic Health Solutions, a health coaching business in the East Tennessee area that offers superior, personalized, and convenient health coaching to our clients. Our experienced coaches emphasize the importance of maintaining a feasible fitness regimen, having a balanced nutritional plan, and developing behaviors that will produce long-term results enabling our clients to live happier and healthier lives.

Poster # 122

How the Internet of Things Can Help Reduce Supply Chain Wastes

Mary Margaret McCullough

Student’s Department: Supply Chain Management

Faculty Mentor: Autry, Chad

The Internet of Things is a relatively new phenomenon, in which inanimate devices can use sensor technology to communicate with one another. Application of IoT in the supply chain is made possible through the use of sensors, which allows consumers, businesses, or other users to monitor specific measures and use the sensor-collected data to reduce various types of waste.

Given that current business applications of IoT remain in such an infancy stage, there isn’t yet a common understanding of best-practice application and usage by businesses. Because of these gaps in our understanding, I interviewed supply chain managers working in various industries to uncover what IoT improvements are necessary and what impacts they will have on supply chain operations. Using these technologies can allow for massive waste reductions in a variety of forms including overproduction, unnecessary transportation of product, or delays, so through my interviews, I determined numerous ways that businesses might better apply and use IoT technology to achieve key performance outcomes.

Poster # 123

A comparison between the environmental initiatives practiced by sustainable companies and the environmental initiatives valued by workers

Joseph Graham Dobbs

Student’s Department: Supply Chain Management

Faculty Mentor: Bell, John Edward

The importance of environmentally sustainable initiatives have been recognized for decades by both American corporations as well as the American public. As more and more companies are encouraging sustainable efforts, it seems that it is always in the best interest of the public as well. Companies are pushing efforts such as waste management and the reduction of greenhouse gases to not only make a positive impact on the environment but also because it seems that
more and more of their employees are wanting their employers to participate in those initiatives. But the question as to whether or not the initiatives that companies encourage are the initiatives that their employees want has yet to be asked. The aim of this study was to conclude whether or not the sustainable practices that companies believe have a positive effect on their employees align with the sustainable practices that employees deem to be the most important. To determine whether or not this was true, an anonymous survey was released to working Americans that aimed to determine what sustainable practices are the most important to each individual in addition to multiple conversations being held with leaders of various sustainable companies.

Poster # 124

"An Overview and Analysis of the Impacts of Extreme Heat on the Aviation Industry"

Brandon Thomas Carpenter

Student’s Department: Supply Chain Management
Faculty Mentor: Holcomb, Mary C

Weather is a common cause of flight delays and cancellations. However, the vast majority of the time we think about weather and its effect on aviation, winter conditions, such as snow, come to mind. Heat is usually one of the last types of weather we associate with airline challenges. Recently, the Bomb Cyclone has made headlines for the headaches it caused with travel, especially at The John F. Kennedy International Airport. Interestingly, the exact opposite of winter weather conditions can cause just as many challenges. Over this past summer, a number of flights at various airports such as Phoenix Sky Harbor International and McCarran International were cancelled because the temperature on the runways was physically too hot for the planes to take off. The cancellations themselves only affected smaller, regional aircraft, but high temperatures still significantly affect larger Boeing and Airbus aircraft in the form of weight restrictions (meaning less passengers, less cargo, and potential delays in departure). This project overviews and analyzes the incident that occurred in Phoenix, details how heat significantly affects both small and large aircraft, and poses a few potential solutions that can help mitigate the effects of extreme heat on the aviation industry.

Poster # 126

Supply Chain Sustainability: Understanding the Financial Impact

Matthew Joseph Guinn

Student’s Department: Supply Chain Management
Faculty Mentor: Mollenkopf, Diane A

Purpose:
The purpose of this study is to determine if there is a differential impact on the financial performance of a company between environmental and social events.

Scope:
This study uses a randomization of publicly traded companies within specific, pre-determined SIC codes, which is a collection of 66 companies, split between manufacturing and retail, to get the most accurate representation.

Methods:
This study utilizes multiple regression via STATA to analyze data compiled from the WRDS & Bloomberg, to analyze the percent increase in stock price. Then, given my controls and dependent variables, I analyzed the output of the coefficient between environmental and social to determine which has a greater impact on financial performance.
Results:

My results show statistically significant results across 6 different regressions. The study shows that across the board there is a differential impact between environmental and social events. The results are significant that environmental events have a bigger positive and negative effect on the change in stock price than do social events.

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**Poster # 127**

**Cracking The Bullwhip Effect**

*Rahim Rafiq Tejani*

Student’s Department: Supply Chain Management  
Faculty Mentor: Mollenkopf, Diane A

The Bullwhip Effect is a phenomenon where small disruptions in consumer behavior creates great variations for upstream manufacturers and suppliers. From a planning perspective, the large variation caused from the Bullwhip effect causes many firms to struggle forecasting for such items which can cause the firm to incur excessive production costs, increase their lead time, and struggle to meet customer satisfaction requirements. My thesis is a case study of a CPG firm experiences this variation for one item from one customer. The thesis looks at the specific situation, explains what is causing the large amounts of variation, and how a firm can prevent this.

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**Poster # 128**

**Smarter Work Scheduling: How Telecommuting Weakens the Relationship between Commute Time on Turnover Intentions**

*Hannah Christine Wunschel*

Student’s Department: Accounting  
Faculty Mentor: Moon, Mark A

Current research suggests that commute time is a prevalent job-related stressor, and turnover intentions are a natural ramification of this stress. However, employees increasingly work out of the office, suggesting that time away may affect how negative commutes impact turnover intentions. In this research, I evaluate the effects of commute time and time spent away from the office on turnover intentions. Pulling from a sample of fully employed adults, I find that turnover intentions are lowest when employees have a low commute time and are allowed to spend most of their time away from the office, and that high commute times and time in the office result in the highest turnover intentions. I discuss practical implications of these findings for work scheduling and management.

Keywords: turnover intentions, commute time, stress, telecommuting

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**Poster # 129**

**Supplier Network Mapping for Sustainability Dispersion**

*Francis Xavier Murph*

Student’s Department: Supply Chain Management  
Faculty Mentor: Tate, Wendy

Sustainability is a word we see appearing more and more in various contexts, especially in business. This idea that sustainability ‘creates profits’ while ‘protecting the environment’ reinforces the new thinking that focusing on
environmental impact can do more than increase public opinion; these practices can cut costs and increase revenue. Yet even as the inclusion of sustainable projects and efforts becomes progressively more attractive, it is no easy feat to implement. Organizations must understand their business strategies and values to best determine the areas of interest for these efforts.

The purpose of this paper revolves around how analyzing a company’s position can reveal insight on their surrounding network and can offer suggestions for how to improve connectivity and responsiveness of those surrounding them. Resulting analysis can answer questions regarding relational power within a network, and how a company can best spread its sustainable efforts throughout the network.

The research analyzes two competing firms with slightly different stances on sustainability efforts. The network comparison of two seemingly alike electronic companies contributed to the idea that understanding the structural alignment of power in a supply network does help with the diffusion of a focal firm’s initiatives.

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**College of Education, Health and Human Sciences**

**Poster # 130**

**Contact with the Criminal Justice System, Social Support, and Depressive Symptoms in Women**

*Sonja Arianna Lipma*

Student’s Department: Child and Family Studies  
Faculty Mentor: Johnson, Elizabeth Inez

Research suggests that individuals with arrest histories are at an elevated risk for depressive symptoms. Despite growing interest in this field of study, health concerns for women who have been arrested have not been thoroughly examined. In an effort to narrow this gap in the literature, this study analyzed data for 535 women who participated in the Mobile Youth and Poverty Study. Depressive symptoms and self-reports of mental health were compared for women with and without a history of arrest, and the potential role of social support as a buffer against the negative impact of arrest on mental health was examined. We hypothesized that a history of arrest is associated with more depressive symptoms, and that the effects would be stronger for women with low levels of social support than for women with high levels of social support. Preliminary analyses indicate that there is a significant relationship between having an arrest history and depressive symptoms. We did not, however, find evidence that social support moderated the relationship between arrest history and depressive symptoms. Results are discussed in terms of the lasting impact of criminal justice contact on health and other possible ways that social support might factor into the equation.

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**Poster # 131**

**Contact with the Criminal Justice System, Racial Discrimination, and Mental Health**

*Chakhiria T Parks*

Student’s Department: Child and Family Studies  
Faculty Mentor: Johnson, Elizabeth Inez

Researchers have shown that women who have had contact with the criminal justice system are at risk of experiencing depressive symptoms. Research has further shown that discrimination fully mediates the relationship between incarceration and depressive symptoms for men (Assari et.al. 2017). However, less research has looked at the effects for women and factors that could moderate this relationship. We hypothesized that women who have ever been arrested
would report more depressive symptoms than women who have not had contact with the criminal justice system. We also hypothesized that racial discrimination would moderate this relationship, meaning that individuals who perceive more racial discrimination would report greater depressive symptoms than those who perceive less racial discrimination. Our analysis included 535 women from the Mobile Youth and Poverty Study. Preliminary results suggest that criminal justice contact is positively associated with depressive symptoms among women and that racial discrimination moderates this relationship. This finding suggests that among women who have ever been arrested, those with greater perceptions of racial discrimination reported more depressive symptoms. The findings have implications for public policies that aim to improve our justice system and to improve the well-beings of those who have had contact with it.

Poster # 132

**Does Hookup Partner Type Matter? Condoms, Drunkenness, and Emotional Reactions**

*Kevin Morris Treadway, Kayley Nicole Davis*

Students’ Department: Child and Family Studies  
Faculty Mentor: Olmstead, Spencer

Recent research indicated that many emerging adults engage in the casual sex experience known as hooking up (Garcia et al., 2012). A hookup can include various sexual behaviors (e.g., kissing to intercourse) outside the context of a committed relationship (Owen et al., 2010). Limited attention has been given to the relationship between hookup partner type (e.g., stranger, acquaintance, friend, ex-romantic partner) and a number of important sexual health and wellbeing outcomes. We examined associations between most recent hookup partner type and condom use (during penetrative sex behaviors; e.g., oral sex and/or intercourse), alcohol use (self or partner “drunk”), relationship formation, and emotional reactions (positive and negative) to the hookup.

A total of 783 participants were removed from the study because they had not hooked up in the last 12 months, their last hook up was with a committed relationship partner, or they dropped out of the study prior to completing relevant study variables. The final study sample (N = 835) were on average 19.1 years of age (53.9% women, 84% white/Caucasian, 95% heterosexual). Variables included partner type, drunk status of participant and partner, condom use during penetrative sex hookups, whether or not a romantic relationship was formed with the hookup partner, and the Emotional Reactions to Hookup Scale (5 positive, 5 negative, [1] Not at all to [5] Very much; Owen & Fincham, 2011). Chi-square analyses indicated that the proportion of participants who engaged in penetrative sex hookups and did not use a condom was not significantly different compared to those who engaged in penetrative sex hookups and did use a condom. There were significant proportional differences based on partner type and forming a romantic relationship. Finally, mean scores on participants’ emotional reactions to their last hookup did not differ based upon hookup partner type, with the exception of feeling “pleased.” Implications for future research and sexual and relationship education are discussed.

Poster # 133

**Use of Consumer Physical Activity Monitors for Estimating Energy Expenditure in Youth**

*Brandon Jesse Clendenin*

Student’s Department: Kinesiology  
Faculty Mentor: Crouter, Scott E

The purpose of this study was to examine the validity of consumer-grade physical activity monitors (PAMs) for predicting energy expenditure (EE) in youth. Ninety-five youth (mean(SD); age, 12.2(3.5) yr; 49% male) performed approximately 2-hrs of semi-structured activities ranging from sedentary to vigorous intensities. Participants wore a Cosmed K4b2
(measured EE) and simultaneously wore an Apple Watch 2 (left wrist) and Mymo Activity Tracker (right hip). Subsamples wore Misfit Shine 2 devices (right hip and right shoe, n=27), Samsung Gear Fit 2 (right wrist, n=44), and/or a Fitbit Charge 2 (right wrist, n=53). Measured EE (kcal) for the whole trial was expressed as gross EE and net EE (gross EE minus resting EE). 95% equivalence testing with ±10% equivalence zone was used to assess equivalence between the estimated (PAM) and measured EE. Mean absolute percent error (MAPE) was used to assess individual-level error. Only the Mymo was significantly equivalent to measured gross EE with a MAPE of 42.1%. No other PAMs were equivalent to measured gross or net EE and had MAPEs ranging from 17.6 to 56.4%. Caution is warranted when using consumer-grade PAMs in youth for tracking EE as there is a high degree of variability in device output.

Poster # 134

A Comparison & Discussion of Concussion Protocols for Youth in Tennessee

Corinne Chablis Oliphan

Student’s Department: Management Faculty Mentor: Hardin, Robin L

Nearly 4 million people experience Concussions and Chronic Traumatic Encephalopathy (CTE) each year in the United States (TBI: Get the Facts, 2017). The focus of this research is to examine the Tennessee State Concussion Statute and compare it to existing and the most current literature regarding the implementation and effectiveness of the statutes of other states. Concussion standard of laws exist in nearly every state with the intention of regulating public and private protocol. Most existing research points to the inadequacies of certain state laws; however, this study will specifically focus on where the Tennessee State Concussion Statute succeeds or fails in preventing concussion occurrence. The research methodology consists of a review of the Tennessee State Concussion Statute, a comparison of other state concussion laws, existing law reviews and case analyses regarding the implementation and effectiveness of the statutes.

Poster # 135

Indoor Group Cycling Participation, Anthropometric Variables, and Blood Pressure

Miguel Aranda, Alvin Lewis Morton, Derrick Tremain Yates

Students’ Department: Kinesiology Faculty Mentor: Hornbuckle-Lampkin, Lyndsey M

PURPOSE: To identify the relationship between indoor group cycling participation, anthropometric measurements, and resting blood pressure. METHODS: Fifty-four male and female indoor group cyclists (age: 46.8±14.5 years) currently participating in classes ≥1 day/week for ≥3 consecutive months were recruited. Height and weight were measured on-site at the participants’ respective cycling facility using a portable stadiometer and digital scale, respectively. Body mass index (BMI) was calculated from height and weight. Waist circumference measurements were taken at the narrowest portion of the waist. Resting systolic (SBP) and diastolic (DBP) blood pressures were measured in duplicate using an automated cuff. Pearson correlations were conducted on all variables with significance accepted at p<0.05. RESULTS: There was an inverse correlation between total lifetime years of cycling participation and weight (r=0.32) and BMI (r=0.28). Waist circumference was positively correlated with body weight (r=0.89), BMI (r=0.81), SBP (r=0.41), and DBP (r=0.39). CONCLUSION: These data suggest that more participation in cycling over the lifetime is associated with lower body weight and BMI values. As
this sample also showed that both body weight and BMI were positively correlated with blood pressure, further research in a larger sample should examine the association between long-term cycling participation and blood pressure.

**Poster # 136**

**FEASIBILITY OF USING PERSONALLY ADAPTIVE PHYSICAL ACTIVITY PROMPTS**

*Ethan Thomas Schaltegger*

Student’s Department: Kinesiology  
Faculty Mentor: Strohacker, Kelley Amanda

**Background:** There has been a growing interest in promoting physical activity (PA) using short message service (SMS, or text messaging) to provide reminders, educational information, or allow self-monitoring. We have integrated SMS and Internet platforms which utilize both text and visual media. Before using this system in interventions, evaluation of this interface is needed. **Purpose:** Determine feasibility of providing adults with multimedia PA prompts designed to match current physical/mental states. **Methods:** Adults (age 30-65) will be recruited using email and social media platforms. Respondents will be directed to a survey link (Qualtrics) and directed to a set of five questions measuring PA readiness using “right now” perceptions of fatigue, physical discomfort, hydration, emotional state, and energy. A PA prompt will then be chosen to match the prompt’s demand to respondent’s readiness. Each prompt will be accompanied by an animated image (graphics interchange format; GIF) visualizing the suggested activity. **Survey items will 1) collect respondent feedback regarding quality of GIF, 2) gauge self-efficacy of performing suggested activity, and 3) assess demographic characteristics. Analysis includes evaluating population variance of readiness and means and standard deviations of quality and self-efficacy to determine whether the activities and GIF representations are acceptable. Results: Results pending.

Supported in part by a University of Tennessee Semester Research Assistants Program Grant

**Poster # 137**

**Zyflamend Attenuates High Fat Diet-Induced Obesity in Mice**

*Summer Smith*

Student’s Department: Nutrition  
Faculty Mentor: Bettaieb, Ahmed

Obesity is a growing epidemic in the United States, affecting more than one-thirds of adults. There is also a growing body of evidence highlighting the contribution of adipose tissue to systemic inflammatory state that play a potent role in obesity-associated metabolic syndrome and cardiovascular diseases. Zyflamend is a poly-herbal supplement derived from the extracts of ten different herbs effectively activates AMPK in-vitro in several cell lines. When activated, AMPK is instrumental in inhibiting anabolic pathways that consume ATP, such as lipogenesis and protein synthesis, and enhances catabolic pathways that generate ATP, such as fatty acid oxidation. The effects of Zyflamend on adipogenesis remain largely unknown.

The objective of this study was to investigate the effects of Zyflamend treatment on adipogenesis and glucose homeostasis. We report decreased adipogenesis of mouse and human adipocytes in-vitro. Moreover, mice treated with Zyflamend exhibited improved glycemic control and enhanced insulin signaling in the muscle and adipose tissue compared with control mice. Further, Zyflamend treatment attenuated chronic HFD-induced endoplasmic reticulum (ER) stress in adipose and muscle tissues. Together, these studies identify Zyflamend as a potential treatment for obesity and metabolic syndrome and warrant additional investigation into the mechanism(s) of Zyflamend’s metabolic actions.
Poster # 138

Relationships between Youth's Assessed Dietary Quality, Youth Social Characteristics, and Familial Mealtime Practices

Ainsley Caitlin Ellington

Student’s Department: College Scholars Program
Faculty Mentor: Colby, Sarah Elizabeth

Decreased cooking skill has been identified as a potential causal factor in the obesity epidemic. Increased home cooking has been associated with increased diet quality. iCook was a cooking program created to increase cooking skills and home cooking frequency among 9-10-year-old youth and the youth’s primary meal provider. At baseline, adults and youth completed surveys assessing factors including family meal patterns. As a part of the iCook program, youth created cooking videos (n=119) that were shared on an online platform. Posted videos were analyzed for content and coded for themes. Correlations revealed that in videos, children observed to be preparing more nutrient dense foods were also observed to be more outgoing (r= .219, p=0.021) and more confident (r=.291, p=0.037). These youth also had parents that reported planning meals ahead of time (r=.209, p=0.031) and were less likely to have family evening meals (like pizza) frequently delivered to their home (r= -.307, p=0.001). Foods selected for preparation in cooking videos created by cooking program participants may provide insight into participants’ nutrition-related behavior.

Poster # 139

iCook 4-H: Child's Independence and Resilience Associated with Parental Involvement in Family Mealtime Settings

Magen Carly Payne, Ainsley Caitlin Ellington, Sa'Nealdrad Tameka Wiggins, Chelsea Lessard Allison

Students’ Department: Nutrition
Faculty Mentor: Colby, Sarah Elizabeth

The iCook program is an intervention designed to help youth and adults cook, eat, and play together in an effort to help reduce childhood obesity. Youth created and posted cooking videos to an iCook website; researchers thematically analyzed the videos to identify factors present during the filmed cooking occasion. Correlations determined that in videos, youth observed to be more resilient were also more independent (r=.249, p=0.006) and more outgoing (r.183, p=0.046). Youth observed to be less resilient were more likely to have parents that felt youth should always eat all of the food on their plate (r= -.198, p=0.034) Less independent youth were more likely to have parents that reported in surveys conducted before intervention that they had to be especially careful to make sure their child ate enough (r= -.184, p=0.05). More independent youth were likely to have parents who were less satisfied with the degree of closeness between family members (r= -.188, p=0.045) and less satisfied with the fairness of criticism within the family (r= -.187, p=0.046). Additional research is needed to understand why youth may be more resilient and independent, and how these factors may be associated with nutrition-related behaviors.

Poster # 140

The Effect of Dietary Fiber on Satiation

Janelle Chavarri

Student’s Department: Nutrition
Faculty Mentor: Raynor, Hollie Anne

Dietary factors that increase satiation are important for obesity treatment. Dietary fiber, categorized by its fermentation and viscosity properties, can enhance satiation, with fibers with fermentable and viscous properties (β-glucan)
hypothesized to be more satiating than fibers with only viscous properties (psyllium). This study examined the effects of two viscous fibers differing in fermentable properties, delivered via a brownie, on satiation. Using a within-subject design, 10 participants (age = 23.8 ± 3.1 yrs; body mass index = 23.3 ± 1.5 kg/m2; 50% female; 50% non-Hispanic white) were randomized to an order in which they consumed a brownie (no fiber, β-glucan, and psyllium) followed by an ad libitum lunch. Fiber brownies contained 8 g of fiber. Grams of food consumed and hunger and fullness measures were collected. No significant difference occurred in food intake between the three sessions (no fiber = 813.3 ± 150.5 g; β-glucan = 833.4 ± 158.8 g; psyllium = 814.4 ± 171.3 g). Fullness significantly (p = 0.015) increased during sessions, with no difference between sessions, and no significant change occurred for hunger. Consuming dietary fiber prior to lunch did not influence lunch intake. A greater amount of fiber may need to be consumed to influence satiation.

**Poster # 141**

**Differences in Recommended Intakes of Nutrients and Actual Consumption as Reflected in Plate Waste Study**

*Megan N Prather*

Student’s Department: Nutrition  
Faculty Mentor: Spence, Marsha Lynn

Many adolescents do not meet the recommended dietary intakes for macronutrients or micronutrients. However, their exact intake can be difficult to assess. The purpose of this study is to determine the plate waste from two dinner meals at three different afterschool sites in East Tennessee. A random sample of 100 dinner meals from children at three different afterschool programs was selected at two points in an academic year. The different types of food remaining on the plates were weighed separately. From this data, calculations were made to determine the mean gram amount consumed for each type of food. The mean calories and mean gram amounts of macronutrients and mean micrograms of select micronutrients consumed were determined. This data will be used to compare the actual intake with recommended intake (this data is to be determined).

**Poster # 142**

**An Examination of Treatment Protocol for Infants with Neonatal Abstinence Syndrome**

*Morgan Juliana Hartgrove*

Student’s Department: College Scholars Program  
Faculty Mentor: Meschke, Laurie

Objective: To investigate best practices in the postnatal treatment of NAS, we describe the characteristics of infants with NAS and whether outcomes differ by three opioid withdrawal treatment protocols. These outcomes include days to wean (DTW), length of stay (LOS), max morphine dose, initial morphine dose, inpatient days, and number of rescue doses.

Methods: Medical record data for 1446 infants informed this study. Each infant received one of three withdrawal treatment protocols. In Group 1 (n=841) the prescriber ordered initiation and escalation doses and determined infant capture. Group 2 treatment (n=235) is the same as Group 1, but a rescue dose or increased medication in response to infant’s escalated symptoms is added. Finally, Group 3 treatment (n=370) was similar to Group 2, with the addition of nurse-assisted order of morphine in escalation phase, including rescue dosing. Chi-squared and ANOVAs with post-hoc Scheffe tests determined whether treatment related outcomes differed between the three protocols.

Results: Group 1 had a longer LOS, DTW, inpatient days, and initial morphine dose compared to Groups 2 and 3. No significant differences emerged between Groups 2 and 3, which differed only in who was permitted to administer the protocol during the escalation phase.
Poster # 143

Brand Communication in a Large Consumer Goods Company: A Case of The Coca-Cola Company

Julianna Mackenzie Deal

Student’s Department: Psychology  
Faculty Mentor: Childs, Michelle Lynn

The purpose of this study is to better understand the flow of communication among the multitude of different bottles within a large consumer goods company, the Coca-Cola Company. This qualitative study conducted several interviews, both with lower and middle level employees, and with executives. Interviews were either conducted in-person or through email communication. Prior to interviewing employees, an informed consent form was signed by each participant, which ensured their privacy. The study applied thematic analysis to determine trends surrounding brand communication within the Coca-Cola Company and strategic methods that employees found both effective and unsuccessful. Results show successful communication themes such as: avoiding micromanagement, creating diversity within teams, using the core values in all decision making, creating a positive office environment, providing helpful critique without hurtful criticism, and collaborating among all departments within the company.

College of Nursing

Poster # 144

The Voices of Photos: Transition to adulthood in lower income emerging adults with Type I Diabetes Mellitus

Michael J Curtis

Student’s Department: Nursing  
Faculty Mentor: Abdoli, Samereh

Emerging adulthood (18-30 years old) is a vital, constructive period presented by exploration, experimentation, and risk-taking (1). Emerging adults with Type 1 Diabetes Mellitus (T1DM), face unique challenges managing their illness due to the additional daily demands of diabetes care and navigating the life transitions of adulthood (2). Diabetes management can be more challenging for low-income emerging adults with T1DM living in Appalachia, an underserved area. This can place them at an increased risk for poor glycemic control, emergence of chronic diabetes complications, and premature mortality (3-4). However, there is a lack of science particularly about the experience of low-income emerging Appalachian adults with T1DM during transition to adulthood. Understanding the experience of this marginalized population will inform future empowerment interventions. This study will use photovoice, an innovative qualitative and participatory research (5) to explore the challenges of lower income emerging adults with T1DM during transition to adulthood. Photovoice this study will entail putting camera in the hands of low-income emerging adults with T1DM in Appalachian Tennessee, and asking them to visually present their challenges in diabetes management during transition to adulthood. It may help health care providers appreciate an emerging adult’s personal experience about their transition to adulthood.

Poster # 145

Interventions to Increase Nursing Retention: An Evidence-Based review of existing literature

Carolynn E Clemons, Megan B Hodge, Sean Ferrell Lenihan
Decreasing nurse retention rates across all areas of nursing practice represents a serious problem in every aspect of healthcare, affecting both the quality and continuity of patient care. This lack of retention results in nursing shortages and a subsequent influx of new, inexperienced nurses. The purpose of this review of evidence-based literature is to explore the relationship between providing leadership opportunities, increasing self-scheduling, and decreasing the nurse-patient ratio on nurse retention in the hospital setting. The primary objective is to lead to an increase in nurse retention in the hospital setting. The methods used in the search for literature included a survey of the literature available on PubMed in full text format through the University of Tennessee Knoxville Library online access. The search terms used were “nurse retention AND leadership training” (57 results), “nurse retention AND self scheduling” (8 results), and “nurse retention AND nurse patient ratio” (11 results). These results were narrowed by filtering articles to those published within the last five years. Conclusion will be determined following the analysis of the review of literature.

Poster # 146

The Impact of Physical Activity on Obesity in Elementary Students’ Cardiovascular Health in Knoxville, Tennessee

Ashlee Taylor Munoz, Jordyn Nycole Voyles, Anna Marie Toldi

Problem Statement and Background: Childhood obesity is a rising epidemic, especially in the United States. It is linked to many health problems such as diabetes, stroke, high blood pressure, and other cardiovascular diseases. The problem being addressed is obesity in elementary school adolescents (ages 5-11) in East Tennessee, specifically Knoxville. The rationale for this work is the national epidemic of cardiovascular diseases.

Purpose and Research Questions: The purpose of this paper is to evaluate the intervention of incorporating physical activity into elementary curriculum in comparison to no physical activity/extracurriculars and whether or not it contributes to decreased cardiovascular risks. Review of Literature: The literature reviewed demonstrated how the inclusion of a physical activity program in schools led to a decrease in obesity and cardiovascular risks. The articles that were gathered were published between the years of 2010-2017. Four of these articles studied different measurements to determine a correlation between obesity and cardiovascular risks. Seven studies incorporated interventions to decrease childhood obesity rates and associated cardiovascular risks.

Conclusions—Recommendations for Practice: Incorporating 30 minutes of moderate physical exercise and a balanced nutritional diet into elementary curriculum for children ages 5-11 will likely decrease obesity and cardiovascular risks in children. We recommend adding mandatory physical education and nutritional education plans in all elementary schools. Studies assert to have a decrease in body fat and therefore a decrease in cardiovascular risks when activity and diet interventions were implemented.

Poster # 147

Emotion-Focused Coping Among Individuals with Fibromyalgia

Starla Mikel Smith

Fibromyalgia is a chronic pain disorder characterized by chronic widespread pain. It is an illness that can also include fatigue, sleep disorders, neurological symptoms, impaired memory, and depressed mood. Coping is a term used to define how a person deals with a problem. Emotion-focused coping is a form of coping for individuals with fibromyalgia that addresses the toll a chronic illness can take on a person when the illness is permanent.
A research project of qualitative design was done using five public blogs written by individuals with fibromyalgia. Using a qualitative thematic analysis, three reoccurring themes were identified: Emotion-Focused Coping Strategies, Priorities for Self Management, and Hobbies & Creative Expression. The subcategories for Emotional Coping Strategies are: Avoidance/Distraction, Positive Reappraisal, and Seeking Social Support. The subcategories for Priorities for Self Management are: Alleviating Symptoms, Mental Stressors, Spreading Awareness, and Self Identity. The subcategories for Hobbies & Creative Expression are: Writing, Reading, Visual Entertainment, and Social Outings.

By identifying what the primary concerns are for individuals with fibromyalgia and how they are coping with a chronic pain illness, this can potentially create awareness of these concerns and change healthcare practices to provide better holistic care for this patient population.

**Poster # 148**

**Pain Reduction in a Virtual World**

*Madison Taylor Myers, Samantha Taylor Anasky, Elizabeth Smith Gore, Matthew Townsend Mustard, Alexandra Aliene Schafer*

Students’ Department: Nursing

Faculty Mentor: Koszalinski, Rebecca Susan

Problem statement and background: Pain management is a challenging factor facing modern healthcare. There is continuing research on adjunctive therapies to use alongside the pharmacological advances to treat pain. Virtual reality therapy is one possible adjunct being researched to further explore its safety and effectiveness in pain management. Most research is conducted in burn patients, considering the widespread and consistent pain associated with this population.

Purpose and research questions: The purpose is to explore virtual reality’s impact on the pain management of burn victims by examining the past and current literature available. The following research question was considered: Could virtual reality aid in the pain management of burn victims?

Review of Literature: The results of past and current literature reveal virtual reality, in combination with the standard pharmaceutical therapy, reduces pain levels to some extent. Most studies excluded patients with motion sickness, neurological injury, and history of seizures, so virtual reality therapy is not beneficial for all. For those who participated, the great majority of patients experienced either pain reduction or pain distraction.

Conclusions—Recommendations for practice: After a review of the literature it is suggested that virtual reality is safe and effective when combined with standard pharmacological therapy. Virtual reality is becoming more easily accessible and can be implemented by trained nurses and staff. Further research is recommended with larger samples for longer periods of time to investigate the long-term effects of virtual reality therapy.

Keywords: virtual reality, burn patients, pain reduction, pain distraction, dressing changes, physical therapy

**Poster # 149**

**The Impact of Male Circumcision on Genitourinary Infection Rates**

*Haley Nicole Salava, Chelsea Lee Cudak, Elizabeth Riordan Gasnow, Jennifer L Matteson*

Students’ Department: Nursing

Faculty Mentor: Koszalinski, Rebecca Susan

Problem Statement and Background
Incidence of urinary tract infections and different types of sexually transmitted infections remains a significant issue in a variety of populations worldwide. Neonatal male circumcision is a procedure that should be considered as a means of reducing infection rates in neonate males, adult males, and their partners. Historically and today, circumcision has been a practice that varies depending on geographical region, ethnic preferences, or other personal beliefs or reasons. Purpose and Research Questions

The purpose of reviewing literature is to determine if circumcision of male newborns decreases the likelihood of developing urinary and reproductive tract infections. Significant evidence gathered will potentially guide parents to make an educated decision about the circumcision of their newborn sons. It lies in question whether circumcision does in fact reduce infection rates and which specific types of infections are most reduced.

Review of Literature

The literature analyzes the infection rates in question. Human immunodeficiency virus (HIV), sexually transmitted infections (STI), and urinary tract infections (UTI) were among the most studied infections related to circumcision and its protective factor or lack thereof. Trichomonas vaginalis and syphilis were also examined. The majority of these studies found a positive correlation between infection rates and uncircumcised men and their partners, including an increase in UTIs, human papilloma virus (HPV), and bacterial infections. Circumcision’s effect on HIV infection rates remains unclear.

Conclusions and Recommendations for Practice

The results predominantly displayed a decrease in infection rates in circumcised males when compared to uncircumcised males. The studies did not control for extraneous variables such as hygiene, sexual practices, and condom use. Reviewers recommend that other studies be conducted to examine the effects of said extraneous variables on infection rates in uncircumcised males and their partners. Recommendations also include that nurses provide education on the risks and benefits of circumcision when a family is making the decision on whether or not to circumcise their son.

**Poster # 150**

**The Needs of Caregivers of NICU Graduates**

*Megan Kay Borgmier*

Student’s Department: Nursing  
Faculty Mentor: Bland, Tami

A neonatal intensive care unit (NICU) specializes in the care of premature or ill infants. Caregivers of infants admitted to the NICU can find themselves in a state of distress that begins at the time of hospitalization but can continue during the discharge process and beyond. The author conducted a literature review to elucidate the state-of-the-science regarding the needs of caregivers of NICU graduates post-discharge and effective strategies to reduce parental distress. While there are a variety of support systems available during the infant’s NICU stay, a gap exists regarding support for caregivers post-NICU discharge. It’s important to examine the experience of caregivers in the first month post-discharge. The findings from this literature review set the stage for future research by determining if a technology-based support system intervention would meet the needs of NICU graduate caregivers after their infant’s discharge. The author created a survey that was distributed to a variety of social media sites in order to understand the distress experienced by NICU graduate caregivers after discharge and discover the interest in digital technology as a support system. This survey received 230 responses. The presentation will include final analyses of quantitative and qualitative data.
Poster # 151

Mood-Matched Music, a Nursing Intervention for Reducing Anxiety of Cardiac Patients

Shawna Nakiesha Spurgeon, Coulisse Olivia Bialic-Murphy, Chasity Brooke Coffey

Students’ Department: Nursing Faculty Mentor: Koszalinski, Rebecca Susan

Problem: One of the most common and complex issues nurses face includes helping patients reduce anxiety while in the hospital. Presently, pharmacology and distraction techniques are the main interventions. Current research suggests music may be a useful form of reducing anxiety and pain during procedures.

Purpose: The aim of this study is to explore empirical research investigating the use of mood-matched music a nursing intervention.

Review of Literature: A qualitative analysis was used to evaluate 62 journal articles to determine whether mood matched music makes a significant impact on anxiety. Discussion on how to create a standardized process for nurses to use music as a regular intervention has the utmost interest. As well as understanding by what mechanism of action listening to music has on the body and it’s pain/anxiety responses.

Conclusion: Research demonstrates significant findings that show positive results for using mood-matched music during inpatient procedures.

Poster # 152

Evaluation of Reliability of Screening Tools to Identify Those Who Experienced Adverse Childhood Events

Rachal Wall, Alex Jadrian Bond, Haylee Shannon Wittman, Elisabeth Grace Hobbs

Students’ Department: Nursing Faculty Mentor: Koszalinski, Rebecca Susan

It is estimated that 60% of American children will be exposed to abuse or adverse events in their lifetime. These abuses include physical, verbal, emotional and/or sexual abuse. Forty percent of American children were direct victims of two or more physical attacks. Research is emerging showing a direct correlation between adverse childhood experiences and health disparities later in life. Adults and adolescents with a history of abuse are at higher risk of abusing alcohol and drugs, smoke cigarettes and be diagnosed with a psychiatric disorder. They also have an increased incidence of cardiovascular disease, obesity, and depression.

Instruments like Adverse Childhood Experience (ACE) and Behavioral Risk Factor Surveillance System (BRFSS) have been developed and validated to identify persons exposed to abuse and childhood dysfunction. The original ACE Study was conducted at Kaiser Permanente from 1995 to 1997 where they developed the ACE survey. The survey focuses on the first 18 years of life. It asks about frequency of physical abuse, sexual abuse, emotional abuse, physical neglect, emotional neglect, mother treated violently, household substance abuse, household mental illness, parental separation or divorce and incarcerated household members. It consists of two questionnaires, the Health Appraisal Questionnaire and a Health History Questionnaire, both of which are gender specific.

The ACE survey is helpful in determining if an adult will need a more multidisciplinary approach due to the increase in risk factors. Another popular survey used in clinical practice is the Behavioral Risk Factor Surveillance System (BRFSS).

Conclusions and recommendations to be determined.

This is a classroom project.
**Poster # 153**

**Increasing Vaccination Rates Among College-Aged Males**

*Austin Tyler Smith*

Student’s Department: Nursing  
Faculty Mentor: Bland, Tami

In 2009, the Human Papillomavirus vaccine, commonly known as Gardasil, was approved by the CDC for use in the U.S. male population. This recommendation came only three years after the approval of the vaccine in females. Vaccine rates among college-aged males, however, remain much lower than the rates of their female counterparts. The objective of this review is to identify factors that lead to this discrepancy in the college-aged male population. A systematic review of literature was conducted with CINAHL and PubMed using the terms: “HPV,” “male,” “college,” “vaccination,” “barrier,” and “STI.” The articles that were reviewed attribute the current HPV vaccination rates to healthcare barriers, knowledge deficits among target populations, and the methods by which HPV-related information is communicated to patients. Weakening these barriers, increasing general vaccine knowledge, and improving methods of relaying vaccine information are promising ways to increase vaccine uptake. This increase in HPV vaccination will decrease transmission of the virus, incidence of HPV infection, and subsequent pathologies (i.e. cervical cancer, genital warts, etc.). More research is needed in order to identify specific interventions that are effective in increasing the willingness of unvaccinated males to begin the vaccination series during their time in college.

**Poster # 154**

**Catheter Associated Urinary Tract Infection Prevention: A Review of the Literature**

*Alexandria B Dunn, Savannah C Elliot, Isabella W Chu, Savannah Rae Osborn*

Students’ Department: Nursing  
Faculty Mentor: McLennon, Susan Margaret

It is estimated that 60% of American children will be exposed to abuse or adverse events in their lifetime. These abuses include physical, verbal, emotional and/or sexual abuse. Forty percent of American children were direct victims of two or more physical attacks. Research is emerging showing a direct correlation between adverse childhood experiences and health disparities later in life. Adults and adolescents with a history of abuse are at higher risk of abusing alcohol and drugs, smoke cigarettes and be diagnosed with a psychiatric disorder. They also have an increased incidence of cardiovascular disease, obesity, and depression.

Instruments like Adverse Childhood Experience (ACE) and Behavioral Risk Factor Surveillance System (BRFSS) have been developed and validated to identify persons exposed to abuse and childhood dysfunction. The original ACE Study was conducted at Kaiser Permanente from 1995 to 1997 where they developed the ACE survey. The survey focuses on the first 18 years of life. It asks about frequency of physical abuse, sexual abuse, emotional abuse, physical neglect, emotional neglect, mother treated violently, household substance abuse, household mental illness, parental separation or divorce and incarcerated household members. It consists of two questionnaires, the Health Appraisal Questionnaire and a Health History Questionnaire, both of which are gender specific.

The ACE survey is helpful in determining if an adult will need a more multidisciplinary approach due to the increase in risk factors. Another popular survey used in clinical practice is the Behavioral Risk Factor Surveillance System (BRFSS).

Conclusions and recommendations to be determined.

This is a classroom project.
Poster # 155

The Role of Education in Reducing CLABSI Rates: A Review of the Literature

Laura E Harmon, Celeste Nichole Miller, Brooke Ashley Reinhardt, Erin Colleen Worely

Students’ Department: Nursing Faculty Mentor: McLennon, Susan Margaret

Central line associated bloodstream infections (CLABSIs) are a profound problem in healthcare settings across the United States. These are hospital-acquired infections, or nosocomial infections, that arise in patients receiving treatment for a variety of conditions. The purpose of this project was to examine and determine the efficacy of various methods of staff education in regards to central venous access device (CVAD) care and CLABSI prevention in intensive-care patient populations. The following research question was considered: In patients in intensive-care settings with CVADs, what is the effect of various methods of education on health-care provider knowledge and CLABSI rates? We analyzed 11 relevant studies, including one meta-analysis, between the publication dates of 2010-2017. Most of the literature reviewed consisted of quasi-experimental studies focused on the measures most successful in the effectiveness of CLABSI prevention education programs. We concluded that education was the key in reducing CLABSI rates. Additionally, in order to produce a successful CLABSI reduction education program, the healthcare facility should include a hands-on portion, and re-education was critical in order for healthcare providers to retain knowledge.

Poster # 156

End of Life Care Disparities in the Hispanic Community

Hannah E Anderson

Student’s Department: Nursing Faculty Mentor: Brown, Mary Lynn

Due to advanced health care interventions, the elderly population as a whole is increasing in the United States; the portion of the population that is over 65 is expected to more than double by 2060. In addition, immigration rates are increasing, especially regarding Hispanics. In combination, the older population is becoming more and more racially diverse, with the percentage of non-Hispanic whites over age 65 projected to drop by 24% in 2060. Subsequently, the need for end of life care for Hispanics in our community is growing. However, disparities exist regarding use of end of life services by this population. A comprehensive literature review of 20 studies was conducted. Although it was evident that inequalities do exist, it was not clear why they occur in local Hispanic communities. A survey will be conducted with local Hispanic community members who have varying knowledge on end of life care. Then, an educational seminar will be planned based on those results in order to enhance knowledge of end of life care services. A post-survey will also be conducted to compare understanding before and after the education. There is no data to report since this is an ongoing project.

Poster # 157

Laughter Therapy in Nursing Homes to Increase the Quality of Health: A Review of Literature

Angela Mary McPeek, Madison Claire Stanley, Eleanor Mae Osteen, Margaret Grace Edwards

Students’ Department: Nursing Faculty Mentor: McLennon, Susan Margaret

Problem Statement and Background: With the older adult population increasing rapidly, exploring ways to increase their quality of health in nursing homes is a relevant problem. The amount of laughter in any person’s life can affect their mental
health, which can ultimately lead to effects on a person’s physical health. The addition of laughter therapy into nursing homes can be an efficient and economical way to improve the health of this population.

Purpose and Research Questions: The purpose of this evidence-based project was to examine the effects of various techniques of laughter therapy on the quality of health in the older adult population in nursing homes, and the following research question was considered: What effects does laughter therapy have on the health of the older adult population in nursing homes?

Review of Literature: The results from these various articles suggest that humor therapy, an increase in activity, and social interaction can improve the overall quality of health in the population residing in nursing homes. However, this study specifically focused only on humor and laughter therapy and its effect on the well-being of the older adult population.

Conclusions/Recommendations for Practice: Many improvements were seen in both the emotional and physical health of these nursing home residents. Findings from this literature review indicated that there was a decrease in pain levels, an increase in happiness, decreased agitation, and enhancement to the overall mood. The literature suggests that providing older adults with some form of humor or laughter therapy is an important non-pharmacological intervention and can ultimately improve that individual’s quality of health. Interventions such as laughter yoga and games fostered the most significant improvements in health.

Poster # 158

Hand Hygiene Compliance from Nurses to Reduce Hospital Acquired Infections in Pediatric Patients

Kimberly Phung, Sarah Louise Vance, Jordan Kay Gause, Lindsay Alexandra Garner

Students’ Department: Nursing

Faculty Mentor: McLennon, Susan Margaret

Problem Statement and Background: Hospitalized pediatric patients have a weaker immune system than adults, thus infections in this group could be fatal. Hand hygiene may be an important factor in decreasing hospital acquired infection (HAIs) rates.

Purpose and Research Questions: The purpose of this evidence-based project is to explore hand hygiene compliance to determine its influence on reducing HAIs. The research question was: does nurse compliance with hand-hygiene decrease hospital-acquired infections in pediatric units?

Review of Literature: Databases such as PubMed and Cinahl were used to find sources. Searches were limited to pediatric or neonatal population, and excluded studies that were more than 10 years old. Keywords included “pediatric*”, “neonat*”, “hand-hygiene”, “compliance”, “hospital acquired infection*”. Hundreds of results came up, but only 12 articles fit the inclusion criteria.

Conclusions—Recommendations for Practice: HAIs are easily preventable when the right precautions are taken, such as hand-hygiene practices. Pediatric patients are more susceptible to these infections, thus the importance in reducing these incidences. Many studies have shown that when nurses are compliant with hand-hygiene protocols, HAI rates are lowered significantly. Therefore, hand-hygiene compliance protocols, such as giving nurses their personal bottle of alcohol-based hand sanitizers and implementing a video monitoring system in hospitals serving pediatric patients may beneficial in the reduction of HAIs.
**Poster # 159**

**Cuddling in NAS**

*Morgan Brooke Vantrease*

Student’s Department: Nursing  
Faculty Mentor: Chyka, Deb

The incidence of Neonatal Abstinence Syndrome (NAS) resulting from in-utero exposure to opioids has increased significantly in recent years and continues to grow globally. Treatment results in lengthy and costly Neonatal Intensive Care Unit (NICU) stays and, in areas with increased incidence such as Tennessee, the care needed to support these infants may exceed the availability of nursing staff. Pharmacological therapies are often needed to help infants with NAS withdraw safely. The author conducted a literature review to explore the use of non-pharmacological treatments for infants with NAS using PubMed and CINAHL. While there is mention of non-pharmacological therapies to console infants experiencing NAS, a gap exists in the science pertaining to effectiveness of such therapies on infants or the impact they have on nursing staff. Research regarding this gap will examine the effectiveness of one non-pharmacological intervention, cuddling of the neonate. The author will elicit the perceptions of nursing staff using electronic surveys to identify views of the intervention. This study will generate scientific data that can build the foundation for future research on non-pharmacological therapies in infants being treated for NAS in conjunction with previously collected data regarding physiologic effects of cuddling on neonates before and after cuddling. Data collection is being conducted at this time.

**Poster # 160**

**CAM Therapy Lowering Blood Pressure in Outpatient Cardiovascular Rehabilitation: A Literature Review**

*Erin Scott Anderson, Alexa Leigh Tietgens, Matthew Graham Lopez, Julia Hunter Workman*

Students’ Department: Nursing  
Faculty Mentor: Thompson, Kathleen

The purpose of this literature review is to describe the need for an implementation of CAM therapies to lower blood pressure in outpatient cardiovascular rehabilitation. This review elucidates the implementation of complementary and alternative medicine (CAM) therapy regarding effective strategies to reduce blood pressures in outpatient settings. Cardiovascular rehabilitation, though intended to help cardiac patients, can cause additional stress, which could be controlled with the implementation of CAM therapy in these outpatient facilities. Furthermore, this literature review will analyze the effects of CAM therapy use in cardiovascular patients and determine the need for more CAM therapy interventions within cardiovascular rehabilitation facilities.

**Background:**

Outpatient cardiovascular rehabilitation (rehab) is defined as a center devoted to helping patients improve cardiovascular and/or lung health post cardiovascular interventions. There are a variety of heart, lung, and vascular diseases that are treated within the outpatient cardiopulmonary environment. Patients who participate in outpatient cardiovascular rehab may find themselves in a state of distress beginning from the time of hospitalization and can continue through discharge and therapy due to the many life adjustments a cardiac patient has to make. According to the National Center of Complementary and Alternative Medicine (CAM), by definition, means “CAM is a group of diverse medical and healthcare systems, practices, and products that are not generally considered part of conventional medicine” (“World Health Organization,” 2017).

**Review of Literature and Recommendations:**
There were eleven references that were identified via PubMed and CINAHL databases using the keywords “complementary alternative medicines,” “hypertension,” and “cardiovascular diseases.” While CAM therapy is widely used, a gap exists in the literature regarding the use of CAM therapies in outpatient cardiovascular rehabilitation. It is important to examine the statistically significant effects of CAM therapies in regards to lowering a patient’s blood pressure for medical and therapeutic purposes. The findings from this literature review set the stage for future research by recommending CAM therapies to help meet patients’ needs throughout the duration of their outpatient cardiovascular therapy.

Poster # 161

**The Effects of Uniform Laundering Techniques on the Rate of Cross-Contamination by Nurses**

*Elizabeth Anna Atkins, Chelsae Elizabeth Parris, Karley Eileen Smith, Carly Brooke Sturgill*

Students’ Department: Nursing  
Faculty Mentor: Thompson, Kathleen

Introduction: This review of literature focuses on the effects of laundering techniques such as temperature, time and detergent on contaminated healthcare uniforms. These variables affect the amount of micro-organisms found on unwashed uniforms and the possibility of cross contamination of nurses. Contaminated uniforms can play a significant role in the transmission of infection in the hospital as well as the home setting.

Purpose: Healthcare acquired infections (HAIs) affect all hospital settings, and the reduction in frequency of cross contamination is an aim of all institutions. By generalizing and implementing a standardized plan of laundering care for hospital policy, adherence may be increased, while infection rates and cross contamination may be decreased. This study will review previous studies’ tests conducted on scrubs and analyze what produces the most significant results for decreased contamination.

Methods: PubMed/Medline and UT Library resources were accessed between the months of January and March 2018, searching for articles pertaining to laundering methods of contaminated uniforms from a variety of settings. We included all studies found dealing with bacterial contamination and fungal contamination of new and used unwashed scrub uniforms. Additionally, we reviewed the CDC recommendations for decontamination of clothing using laundry techniques such as temperature and wash time.

Conclusions: To be determined.

Poster # 162

**The Experience of Access to Care Among Persons with a Low Family Income**

*Malerie R Lazar*

Student’s Department: Nursing  
Faculty Mentor: Davenport, Lisa

Low family income presents a wide variety of problems for men and women seeking access to health care. Health care disparities among persons with a low family income (PLFI) continues to be one of the most complex and prevalent problems, particularly for rural America. Many barriers exist for PLFI who seek access to adequate health care in the United States (U.S.). A review of literature revealed common barriers to primary care to be a lack of education, complications with health insurance, and personal distrust of health care providers. Acknowledging the substantial barriers that prevent access to routine health care for PLFI is the first step towards determining future sustainable solutions. A gap in the literature indicates the voice of low-income persons and the meaning of access to care for them is unheard. Future
research will examine the meaning of access to care to PLFI in order to provide insight to how healthcare providers can effectively assist those who are in need. A phenomenological approach will be used to explore the essence of the experience and meaning of access to care for those who receive services of non-profit medical organization clinics (such as Remote Area Medical Clinic), which becomes a typical source of care for low-income persons.

Poster # 163

Using the Picture Exchange Communication System to Improve Communication in Children with Autism

Lajerica M Bates, Anelia V Rizzo, Kayla Ann Batts, Megan Alyssa Seal

Students' Department: Nursing Faculty Mentor: Thompson, Kathleen

Problem Statement and Background

One third of children with Autism Spectrum Disorder (ASD) are nonverbal and lack the communication skills that are imperative to effectively communicate (Rudy, 2017). Without these skills, nonverbal or vocally-limited children with ASD are unable to communicate their needs and concerns with healthcare providers.

Purpose and Questions

The purpose of this evidence-based project was to examine the effectiveness the Picture Exchange Communication System (PECS) has on communicative skills in children with ASD. The following question was used to guide the literature review: In children with autism spectrum disorder, how does the Picture Exchange Communication System improve communication between autistic children and healthcare professionals?

Review of Literature

PECS is a curriculum which has demonstrated efficacy in increasing verbalizations, social interaction, and facilitating communication with peers and adults in children with ASD. No studies on the specific best practices for nurses were found.

Conclusions–Recommendations for Practice

PECS is an effective, cost-efficient method to improve communication in children with ASD. While PECS has shown increased verbalizations in children in clinic and educational settings, more research is needed regarding its efficacy in hospitals. In pilot studies, nurses and healthcare providers could use PECS before a procedure (e.g. IV placement) to communicate the procedure’s course of events and expectations so that the child may be able to repeat the course of events independently to demonstrate adequate understanding.

Poster # 164

Evaluating Nursing Interventions and Their Effectiveness on Decreasing Readmission Rates in Medication Nonadherent CHF Clients

Kimberly Michaela Carter, Alyssa Celeste Richardson, Sloan S Phillips, Madison Sierra Coker

Students’ Department: Nursing Faculty Mentor: Thompson, Kathleen

Chronic heart failure is estimated to affect 5.7 million people in the United States, and that number is set to increase to over 8 million Americans by 2030 (Mozaffarian et al., 2016). It is estimated that as many as half of those Americans
affected by chronic heart failure do not take their medications as prescribed. Medication nonadherence is difficult to assess because the numbers are obtained subjectively from clients (American Heart Association, 2014). Those clients that are nonadherent with their home medications are more likely to experience higher rates of hospital readmissions and poorer health outcomes overall than those clients who are adherent with their home medications (Ho, Bryson, & Rumsfeld, 2009).

The purpose of this paper is to evaluate two different nursing interventions on the effectiveness of decreasing readmission rates in CHF patients by either educating the client with better knowledge of his or her medications upon discharge, or by ensuring the patient is financially able to support the costs of their medications upon discharge.

Methods used to obtain data include a systematic literature search that was performed by utilizing ONESEARCH through the University of Tennessee - Knoxville University Libraries to access CINAHL, Web of Science, and PubMed. Quantitative and qualitative research literature studies were reviewed with consideration given to literature that provided comparative and contrasting evidence to other literature reviewed. Many nursing interventions are being studied as possible tools to decrease the high readmission rates in nonadherent CHF clients. Findings, conclusions, and recommendations are pending for this study.

Poster # 165

Parental knowledge of Adverse Childhood Events and their effect on health and substance abuse disorders

Chelsea V Smith

Student’s Department: Nursing  Faculty Mentor: Davis, Sharon Keck

Events in a child’s life, whether positive or negative, can have a deep, lasting impact. Adverse Childhood Experiences (ACE) are any “stressful or traumatic” event experienced during childhood. This SAMHSA definition encompasses physical abuse, sexual abuse, emotional abuse, physical neglect, emotional neglect, mother being treated violently, substance misuse within household, household mental illness, parental separation or divorce, and an incarcerated household member. ACE are not uncommon events. A literature review was conducted using PubMed and CINHAL databases; the author identified a gap in literature involving parental knowledge about links between ACE and substance abuse. There is evidence connecting ACE to subsequent development of health problems, including substance use disorders. While research shows that early intervention and high levels of parental involvement may be the key to preventing substance use and mental health disorders, no evidence exists concerning parents’ knowledge about ACE and their potential for lifelong effects. The specific gap being investigated is “What do parents know about the links between ACE and substance abuse and early intervention techniques to prevent substance abuse in the future?”

Poster # 166

Aromatherapy Use in Chemotherapy: A Review of the Literature

Gina Marie Cianciolo, Mollie Mckenzee Light, Jessica Sue James-Schultz, Laurel Shelby West

Students’ Department: Nursing  Faculty Mentor: Thompson, Kathleen

Problem statement and background

The primary treatments for cancer are chemotherapy, radiation, and surgery. Although these practices are beneficial in the treatment of cancer, they also can have systemic adverse effects. Common side effects reported by patients for chemotherapy specifically include nausea, vomiting, fatigue, insomnia, anxiety, and constipation. Traditionally these
symptoms induced by chemotherapy have been treated using pharmaceuticals including antiemetics, sedatives, laxatives, and anesthetics. Although these aids in alleviating severe symptoms, complementary therapies like aromatherapy may be used in conjunction with traditional remedies.

Purpose and research question

The purpose of this review of literature was to answer the question: should aromatherapy be added as complementary treatment in reducing adverse side effects in chemotherapy? Review of literature

Ten studies were reviewed and they used various research methods to determine the effectiveness of aromatherapy, in assorted applications, for treatment of chemotherapy side effects. Researchers concluded that aromatherapy was effective in minimizing nausea, vomiting, fatigue, insomnia, anxiety, and constipation associated with chemotherapy. Throughout the ten studies, there were no reports of negative adverse effects or harm to the subjects.

Conclusions-recommendations for practice

In conclusion, a recommendation can be made to incorporate aromatherapy complementary to traditional treatments in oncology. In addition, further research with more Gina M. Cianciolo, Mollie M. Light, Jessica S. James-Schultz, Laurel S. West randomized trials should be conducted to better quantify the specific effects of each essential oil to more adequately address patient complaints and discomforts to provide symptom relief.

Poster # 167

Effectiveness of Music Therapy for Pain Relief in Pediatric Oncology Patients

Sara Brianne Colby, Andrew Kenan Collier, Taylor Alan Warren, Nicholas A McGaha

Students’ Department: Nursing
Faculty Mentor: Thompson, Kathleen

Problem statement and background

Pain often accompanies cancer and its treatments. Reducing pain in pediatric oncology patients is an important nursing goal. Nurses have used distraction techniques as a nonpharmacological method for relaxation and pain control. Music therapy is one of these many techniques. Purpose and research question

The purpose of this evidence-based project was to explore the effectiveness of music therapy pain management for pediatric oncology patients. The following research question was posed: how effective is music therapy on decreasing pain in pediatric oncology patients when used with standard care.

Review of literature

The results from the literature were that music therapy decreases anxiety and pain in pediatric patients, and there was support for the use of music therapy. Other findings were that it also improved overall quality of life, reduced fear of procedures, and provided a sense of familiarity in what can be a scary and intimidating place.

Conclusions and recommendations

The researchers reported the benefits of music therapy and indicated that there was no apparent harm to including therapy in the plan of care. They found that music therapy is most beneficial if the child chooses the music and when to
play it. Recommendations for clinical practice are to include music therapy in the care of pediatric oncology patients to minimize and treat pain.

**Poster # 168**

**Assessing the Impact of Canine-Assisted Activities on Middle Adult Patients in the Trauma Setting Using Physical Parameters**

_Emeri Kaitlin Allan_

Student’s Department: Nursing  
Faculty Mentor: Elliott, Lizanne Munson

The human-animal bond is a mutually-beneficial relationship in which humans and certain animals participate. Health, previously regarded as the absence of disease, encompasses every aspect of human life including physical, social, and mental prosperity. To address holistic wellness, it is necessary to investigate the psychosocial effects animals have on people, specifically in clinical settings where individuals experience declines in physical health. Twenty-three references were retrieved from PubMed and CINAHL Complete and synthesized concerning animal-assisted interventions in clinical settings. Researchers have demonstrated that a beneficial relationship exists between animal-assisted interventions and biophysiologic outcome measures among patients of various ages with a wide range of illnesses. Several gaps in the science exist; one such gap pertains to the lack of data on canine-assisted activity in the trauma setting. The purpose of this presentation will be to (1) articulate the state of the science on animal-assisted interventions in the clinical setting, (2) describe a randomized control trial currently being conducted at the University of Tennessee Medical Center researching the relationship between a canine-intervention and trauma patients’ vital signs, and (3) discuss preliminary findings.

**Poster # 169**

**Effects of Birthing Positions on Labor and Delivery**

_Fox, Bailey, Anna Elizabeth Hoppestad, Hannah M Grant, Vivian Pham_

Students’ Department: Nursing  
Faculty Mentor: Thompson, Kathleen

Problem statement and background: Historically, laboring mothers have been encouraged to use supine positions over upright positions, but supine positions have been correlated with an increase in length of labor, fetal stress, incidence of perineal trauma, and occurrence of emergency Cesarean sections. This shows the significance of the problem with encouraging supine positions among laboring women. Supine positions include: semi-recumbent, lithotomy, flat, and dorsal-recumbent. Upright positions include: squatting, standing, lateral, all-fours, and use of a birth seat.

Purpose and research questions: The purpose of this project was to review studies comparing the outcomes of labor and delivery in an upright or supine position. The research question was: In laboring mothers, are there differences in the length of labor, comfort level, and type of delivery in upright and supine positions during labor and delivery?

Review of Literature: The results from various studies indicated that when laboring women used upright positions, labor time was shorter, there was a decrease in perineal trauma, fetal outcomes were improved (respiratory effects, Apgar scores, birth trauma), and there was a lower incidence in emergency Cesarean sections.

Conclusions—Recommendations for practice: Based on the review of literature, upright positions during labor and delivery result in better outcomes for both the mother and the baby. For this reason, it is recommended that seminars take place in hospitals to educate healthcare providers on the various options and benefits of upright positions. It is also
recommended that healthcare providers then proceed to educate the laboring woman on the various positions available so she can have a unique birthing experience with the best possible outcome.

Poster # 170

Effectiveness of Hourly Rounding on Patient Falls

Abigail N Graves, Summer Erica Gourneau, Chelsie Breann Graves, Alissa Brooke Nash, Hannah Caroline Bass

Students’ Department: Nursing 

Faculty Mentor: Thompson, Kathleen

Problem Statement and Background: Patient falls are the most common adverse event reported in acute care facilities and often result in morbidity, mortality, and fear of falling again (Hendrich et al. 2003; Currie 2008). These adverse events can cost the hospital a large amount due to insurance not reimbursing the patient’s stay and leads to a negative opinion of that hospital or hospital unit.

Purpose and Research Questions: The purpose of our research is to determine if hourly rounding is a realistic intervention and influences on patient falls. To reduce patient falls and call light frequency, and increase patient satisfaction we chose to study this question: does hourly rounding by nurses decrease patient fall rates. This research question struck interest with our research group because this is a problem that has been around health care for a long time and will affect us not only while we are in school but also throughout our careers as nurses. Decreasing the rate of patient falls will improve the quality of care provided by the nurses and will help reach the quality safety goals of the hospital.

Review of Literature: The literature articles reviewed showed the effectiveness of hourly rounding in the 12 articles our research group chose with the intervention of hourly rounding. Two of the other articles referenced were used for support in our rationale for researching this problem. Our research article publication time frame was limited between 2007-2017, but the oldest article chosen for review was from 2012. Due to some lacking in sample sizes and length of pre/post and during intervention data collection, no generalizations could be made relating to hourly rounding. Even without making generalizations, the findings from this research had positive conclusions made related to hourly rounding and the reduction of patient fall rates. Conclusions--Recommendations for Practice: Based on our analysis of current available research, we concluded that hourly rounding is effective in reducing patient falls. The findings were not statistically significant; however, the clinical significance in fall reduction and little to no cost of the intervention, is enough to encourage hourly rounding in all units and facilities. Recommendations for practice is performing a longitudinal study, with a larger population than the current available studies could be beneficial to this area of research.

Poster # 171

Parental Support in Home Environment for Children in a School-Based Obesity Program

Mary Margaret Wilson,

Students’ Department: Nursing

Faculty Mentor: Elliott, Lizanne Munson

Between the years 1988 and 2014, obesity rates among children ages 6-11 have increased by 54%, and extreme obesity by 20%. Obese children are more likely to develop negative health conditions later in life including hypertension, type 2 diabetes mellitus, and breathing problems. Evidence-based literature identifies school-based intervention programs as a promising environment to educate children on obesity while promoting healthy living decisions and decreasing negative
health risks. A review of literature was conducted to further understand these programs and determine what, if any, interventions were being implemented to educate parents on their child’s health behaviors. Keywords such as childhood obesity prevention, parent support, home environment, parental role modeling, and food-related parenting practices were searched in CINAHL and PubMed databases. One of 11 studies on after-school obesity prevention programs addressed parent engagement. Ten studies addressing childhood obesity conducted outside the school setting reported positive changes in children’s health-related behaviors with parental role-modeling. Of the total literature reviewed, a gap exists concerning the integration of parental role-modeling as an effective approach for children’s success in educational interventions of after-school obesity programs. Future research will focus on parental role-modeling using an educational intervention that addresses physical activity and healthier food practices in the home.

Poster # 172

Pain Prevention Methods for Childhood Vaccinations

Lauren Nicole Jannetty, Sarah Catherine Hurlock, Alessandra Moruzzi, Carolyne McCallie Ruffin, Eva Marie Wehr

Students’ Department: Nursing
Faculty Mentor: Thompson, Kathleen

Problem statement and background: Vaccination administration is one of the most common procedures for children ranging from infants to adolescents. Pain upon vaccination is also one of the most common causes of high level needle fears in the future. There are many different options for pain relief, but they are seldom used in the workplace for reasons related to time management, etc. New methods are being tested to see how effective they are at reducing pain upon injection and educating to prevent needle fears in children.

Purpose and research questions: The purpose of this evidence-based project was to explore the effects different methods have on successfully reducing pain and fear associated with the vaccination process in children. The following research question will be used to guide this inquiry: In children receiving vaccinations, which pain reduction methods, compared to current methods, are the most effective to decrease discomfort and fear.

Review of Literature: Results found from the literature proved many strategies and methods helped improve fear and anxiety, some of which include: education practices, EMLA cream, oral sucrose administration, prophylactic analgesics, skin refrigerants, holding techniques, and combination analgesics.

Conclusions—Recommendations for practice: The studies found in infants related to oral sucrose administration are promising and warrant use in clinical settings due to how widely successful the trials have been. Topical administration of analgesics before injection greatly reduce the initial needle stick pain if given upon arrival of the child to the clinic. Education practices for school aged children helped to reduce initial fear upon injection.

Poster # 173

Effectiveness of Oral Care in Reducing Ventilator-Associated Pneumonia in Intensive Care Unit Patients

Joshua Kris Lippincott, Katherine Mary Harbolt, Kathleen Ann Mcinnis, Kate Harmon Johnston

Students’ Department: Nursing
Faculty Mentor: Thompson, Kathleen

Introduction: Mortality rates for VAP are as high as 70%. Not only does VAP contribute to higher morbidity and mortality rates, but it also significantly increases hospital costs by extending the length of hospital stays. Prevention through the execution of proper oral care is therefore a major goal for all providers in optimizing patient care, especially nurses due their role at the bedside.
Purpose Statement: The purpose of this project is to review the literature to determine the most effective method of oral care to decrease the incidence of VAP amongst ICU patients. Methods: Databases, including PubMed, CINAHL Complete, and Academic Search Complete, were used searched using the terms “VAP or Ventilator Associated Pneumonia AND Chlorhexidine AND prophylactic”, “oral care AND ventilator associated pneumonia”, “oral care and ICU”, “VAP AND bundle”, “VAP AND oral care”, “oral care AND ventilator”, “ventilator associated pneumonia prevention” and “VAP AND chlorhexidine”. Sixteen studies conducted within the past five years that investigated the use of oral care in reducing VAP were reviewed to identify commonalities. Articles were excluded if they were published prior to 2012, did not pertain to ICU patients, did not discuss how oral care affects patient outcomes, or if they did not pertain to the intervention of interest: chlorhexidine use. Conclusion: Overall, the articles revealed a strong correlation between chlorhexidine based oral care and reduced incidence of VAP. While there are confounding variables to consider including number of teeth, and nurse compliance to proper oral care technique, they were not significant enough to negate the results of the studies reviewed.

Poster # 174

Barriers to Mental Health Screening in Rural Adolescents

Caitlin Cartwright

Student’s Department: Nursing

Faculty Mentor: Harper, Amanda Blayne

Adolescent mental health is a growing concern in today’s world. Yet, adolescents are not routinely screened for mental health disorders. Healthy People 2020 addresses this concern and the need for increased levels of screening. Additional disparities exist for rural adolescents as compared to their suburban and urban counterparts. Rural youth are shown to have higher rates of depression when compared to their urban and suburban counterparts. Furthermore, the suicide rates among rural adolescents in some parts of the country are twice as high as the rates of adolescents in urban areas. Literature from the past 11 years was reviewed, highlighting the additional barriers rural adolescents face to being screened. These highlights include physician training and beliefs, limited access to screening services, and personal beliefs of guardians and society. A gap evident in literature is the role of rural school nurses in the screening of students for mental health disorders. Rural school nurses face barriers that prevent them from properly and adequately screening students. These barriers include education, resources, and lack of time. Future research will explore rural school nurses’ opinions about barriers that prevent them from screening students. In addition, research will uncover what rural school nurses feel can be done to address these barriers. Data gained from this study may help discover rural school nurses’ needs and allow these needs to be addressed in order to increase the number of adolescents screened for mental health disorders.

Poster # 175

Evaluating Effectiveness of Different Distraction Techniques Among Pediatric Patients

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Students’ Department: Nursing

Faculty Mentor: Thompson, Kathleen

Introduction: Invasive procedures such as venipuncture, blood draws, or laceration repairs can be terrifying and distressing to young children leading to negative pain perception and possibly interfere with the success of the procedure.

Literature Review: The authors explore the effects of different types of distraction techniques that may be used to lessen levels of pain and distress in children undergoing invasive procedures by reviewing 12 research studies, each with a
different distraction method. Results of the research indicated that each method was at least modestly effective in decreasing children’s perception of pain during and after the procedure, and most also indicated a decrease in general distress and fear or anxiety felt during and after the procedures.

Conclusions and Recommendation: The collective results indicate that it is not the actual procedure that is truly painful to children undergoing invasive procedures, but instead the anticipation of the invasive procedure and the fear of pain that breeds anxiety and, in turn, increases pain perception. Any of these distraction methods may be effective in easing pain and anxiety levels in children undergoing venipuncture. A distraction method can be chosen based on the age of the child, the presence or absence of a parent, available staff, and monetary resources.

Poster # 176

Examining Low-fidelity Simulation to Improve Nursing Student Assessment Reducing Cognitive Load

James McKenzie, Matthew Lee Smith, Wade Garrett Collins, Kathleen Anise Clarke

Students’ Department: Nursing
Facility Mentor: Thompson, Kathleen

Transitioning from college to a professional environment is difficult for new nurses. Researchers reported that 17.5% of new nurses leave their first job after one year and 33.5% leave after two. New nurses are often overwhelmed and anxious stemming from a recognition that they lack the competency required for clinical practice. Cognitive overload reduces the nurse’s capacity to critically think in patient care situations. Improving skills, particularly nurses’ assessment abilities may decrease cognitive load and improve critical thinking. This paper examines the inclusion of repetitive, low-fidelity simulation in nursing school curricula to reinforce assessment skills which may reduce cognitive load and improve competency. A comprehensive review of literature was conducted utilizing various search methods to identify relevant, peer reviewed studies. The review of literature found clinical simulation increases confidence. Low-fidelity simulation is a low-cost alternative that may be as effective as high-fidelity simulation when teaching new skills. Repetition improves the transition from didactic learning to clinical practice. Improving skills towards unconscious competence not only improves basic assessment but also decreases cognitive load. Decreasing cognitive load ultimately reduces anxiety and improves critical thinking resulting in better patient care.

Poster # 177

Role of healthcare providers in combating sex trafficking in Knoxville, Tennessee

Avie L Joyce, Stefanie N Schumacher

Students’ Department: Nursing
Facility Mentor: Hurt, Maria

Sex trafficking is a public health issue recognized as a human rights violation occurring worldwide, including in the United States. Although Knoxville, Tennessee, has been identified as a hub for sex trafficking with the crossing of Interstate 40 and Interstate 75 downtown, there is very little literature that focuses on sex-trafficked victims specific to this region. Studies have shown that the majority of victims in the United States have at some point while being trafficked come in contact with healthcare providers. The objective of the literature review was to determine characteristics of sex trafficking victims that could aid in their identification and plan for care by health care providers. The literature was reviewed utilizing PubMed and CINAHL databases using the search terms “human trafficking”, “modern slavery”, “prostitution”, and “sex trafficking”. Common themes included: trauma, stigma and societal influences associated with sex-trafficked victims, coerciveness of pimps and Safe Harbor Laws. Extensive gaps in the literature include best methods for identification and care of sex trafficking victims and their immediate and long-term needs. The intention for our research is to identify
available local resources for victims and survivors and utilize this information to create educational materials and trainings for local healthcare providers.

**Poster # 178**

**Detrimental Effects of Horizontal Violence in the Workplace**

*Brittany Ann Melvin, Angel Dawn Jarrell, Emma X Totillo, Riley Ann Monigan*

Students’ Department: Nursing  
Faculty Mentor: Thompson, Kathleen

Detrimental Effects of Horizontal Violence and Interventions in the Workplace: Problem Statement and Background: Horizontal violence is an ever-growing problem in acute care settings between novice nurses and staff nurses worldwide. Correlated to various negative-effects, including an increase in financial costs, conflicts in nurse-to-nurse relationships, inadequate teamwork, and substandard patient care.

Purpose and Research Questions: The purpose of this paper is to generate sufficient evidence to support the magnitude of horizontal violence and to propose interventions. The research question utilized is: what is the effect of implementation of horizontal violence teaching and continuing education in comparison to teaching nurse educators and implementing zero tolerance policies to increase awareness of workplace bullying.

Review of Literature: Ten research journals chosen by using various online search databases such as CINAHL, Taylor & Francis Online, and Wiley Online Journals. Articles contained studies with statistically significant data, published within the past ten years, and contained novice nurses as the sample population. All provided positive findings of horizontal violence in the acute care setting with suggested interventions. Eight of the ten articles were quantitative, the last two were qualitative.

Conclusions--Recommendations for Practice: The literature found a high prevalence, significance, and impact of horizontal violence in acute care settings. A zero-tolerance policy and continuing education for implementation into the workplace can be used to provide a significant decrease in horizontal violence.

**Poster # 179**

**Preventing Childhood Obesity by Physical Activity: A Review of the Literature**

*Jesica Marie Miller, Kristen Anne Halstead, Rebecca Danielle Stockbury, Olivia Pate Russell*

Students’ Department: Nursing  
Faculty Mentor: Thompson, Kathleen

Problem statement and background: In the last few years, childhood obesity has become a prominent health problem in the United States. Not only does this affect children’s body-image and self-esteem, but this also has a strong influence on their health risks and condition of health into adulthood.

Purpose and research questions: The purpose of this project was to determine if school-based physical activity interventions could aid in prevention or treatment of obesity. The following research question was considered: Would a physical activity intervention in the school environment have an impact on adolescents’ obesity and body mass index (BMI).

Review of Literature: The results of most of the studies indicated that the implementation of a school-based physical activity program decreased the prevalence of obesity and BMIs over 30 in adolescents. Although the studies used various
data measurements, interventions, time periods, and environments, all of the studies focused on adolescents and providing a school-based intervention to increase physical activity to decrease obesity and BMI.

Conclusions- Recommendations for practice: Overall, researchers recommended incorporating physical activity modifications in these children because it is beneficial in reducing childhood obesity rates, decreasing BMI measurements, and preventing health risks into adulthood. It was also discussed that educating children as well as their family in order to establish a healthier lifestyle is just as important to make healthier choices.

Poster # 180

The Psychosocial Responses to and Decision-Making Strategies of Hereditary Cancer Genetic Panel Testing

Gillian P Harris

Student’s Department: Nursing Faculty Mentor: Hutson, Sadie

Cancer genetic testing (CGT) is a powerful diagnostic test that improves prevention and early detection of individuals at high genetic risk of cancer. Since the completion of the mapping of the Human Genome Project, CGT has become increasingly accessible in the clinical setting. However, as gene discovery and sequencing technology improves, the impact of these advancements on patients is less understood. The use of multi-gene cancer gene panel tests has become increasingly more prevalent; as such, the likelihood of incidental or inconclusive findings has increased. This can cause confusion among patients. The author conducted a literature review to outline the science on cancer genetic testing methods, the psychosocial responses to testing among patients, and the unique role of nurses in this process. Forty-six references were identified via PubMed and CINAHL databases using the keywords “genetic testing,” “panel testing,” “genetic counseling,” “psychosocial oncology,” and “women.” A significant gap in the literature exists regarding multi-gene cancer genetic panel tests and the associated experiences and decision-making processes among individuals who have had testing. Future research will specifically explore the experiences of young women with breast cancer who have undergone hereditary cancer risk assessment genetic panel testing that reveals incidental or inconclusive findings.

Poster # 181

Hourly Rounding to Decrease Patient Falls

Abigail Overholt, Andie E Cunningham, Peyton Lane Miller, Whitley Brooke Thaxton, Sofi M Grayson

Students’ Department: Nursing Faculty Mentor: Thompson, Kathleen

Problem statement and background: Patient falls are one of the top adverse events that happen in acute care settings making fall prevention crucial. According to the Center for Disease Control and Prevention, over 800,000 patients a year are hospitalized because of a fall injury. The patients’ health and well-being are at risk. Many different interventions (eg. bed alarms, bed position, and screening tools) have been implemented to attempt to fix the problem because falls have such a negative effect (eg. safety risk, decreased patient satisfaction, and increased hospital cost).

Purpose and research questions: The purpose of this evidence-based project was to explore the effectiveness that hourly rounding has on decreasing the rate of falls and increased patient safety in an acute care setting. The following PICO question was considered: In acute care facilities, how do hospitals that implement hourly rounding compare to hospitals that do not implement hourly rounding in relation to yearly falls rates?

Review of Literature: To evaluate the effectiveness of hourly rounding, we reviewed 11 of the most recent studies published. All articles were experimental and quasi-experimental. The results demonstrated hourly rounding is an
Effective intervention to decrease patient falls. Although there were many benefits to hourly rounding, this evidence-based project focused on the effects hourly rounding had on fall prevention in acute care settings.

Conclusions—Recommendations for practice: Hourly rounding is an effective intervention to reduce patient falls among hospitals in acute care settings. The studies reviewed demonstrated clinical significance in the reduction of falls due to hourly rounding. Evidence lacked when demonstrating the sustainability of hourly rounding benefits over time longer than one year. This limitation in the literature suggests that further studies include data collection for longer than one year.

Poster # 182

Analysis of Interventions Used in Prevention of Burnout in Nurses

Lera Patricia Pearson, Haley Brooke Edwards, Sophia Brannon Lively, Sara Grace Wellsandt

Students’ Department: Nursing  Faculty Mentor: Thompson, Kathleen

The incidence of burnout greatly affects the nursing profession. The profession has the potential to be one of great reward; unfortunately, it comes at a great cost to a nurse’s own health. The purpose of this article is to propose potential interventions, such as mindfulness and nurse residency programs, to reduce the incidence of burnout therefore increasing job retention. The research question to be addressed is, “Do mindfulness and nurse residency programs reduce the incidence of burnout?” A thorough review of current research was conducted using academic databases such as PubMed and CINAHL. Keywords such as, “nurse residency”, “retention”, “mindfulness”, “MBSR”, and “nursing burnout” were used.

In the studies analyzed regarding mindfulness and burnout, five of the six studies found statistically significant reduction in burnout with the implementation of a mindfulness intervention. In the articles that discussed nurse residency programs as a solution to burnout in nursing, all five authors reported increased retention and new nurses’ professional competence and confidence in the workplace, thereby reducing burnout. More research needs to be conducted regarding mindfulness and nursing burnout in medical-surgical nursing, and needs to be done in the United States. Much of the research analyzed for this report was done in specialty nursing and in other countries. Although nurse residency programs were found to be effective according to the research analyzed, they are a relatively new implementation and longitudinal studies should be done to determine their long-term efficacy.

Poster # 183

Communication Difficulties in Stroke Survivors with Aphasia: A Literature Review

Karen Carcello

Student’s Department: Nursing  Faculty Mentor: McLennon, Susan Margaret

Aphasia is a challenging communication impairment and one of the most common causes of disability in the United States. Most cases of aphasia are due to left hemisphere cerebrovascular incident or stroke. The degree of aphasia may be mild, moderate, or severe. Consequences can be overwhelming with psychological, social and emotional implications. The purpose of this literature review was to answer the question: What are the communication challenges and coping strategies used by aphasic stroke survivors. A review of the research literature between 2007 and 2017 was conducted in CINAHL and PubMed databases using key words such as “stroke survivor”, “communication”, and “aphasia” in various combinations. Thirty research articles met inclusion criteria and were selected for review. Two studies examined blog postings. Most studies were about stroke survivors with mild aphasia. Challenges and coping strategies were identified. Aphasia in stroke survivors contributed to significant communication problems and led to serious neurological and psychological effects. No studies focused on the perspectives of stroke survivors with severe aphasia, a notable gap in the
literature. Future research will focus on blog posts written by caregivers and stroke survivors living with severe aphasia to gain a deeper understanding of their experiences.

**Poster # 184**

**Kangaroo Care**

*Brittany Nicole Reeves, Ashely Morgan Epperly, Rylie Paige Stephens, Kaleigh Katherine Malkes*

Students’ Department: Nursing Faculty Mentor: Thompson, Kathleen

Problem statement and background: Babies born from cesarean section are more likely to be deprived of immediate and frequent skin-to-skin contact because the operating room environment interferes. This is a relevant problem for both mothers and babies because they are both not receiving the benefits of skin-to-skin contact.

Purpose and research questions: The purpose of this literature review was to explore the interventions that will improve the use of skin-to-skin contact after cesarean section. To improve practice, the purpose is to identify how to implement skin-to-skin contact in the operating room that is not conducive to implementing skin-to-skin contact. The following research question was considered: What are the benefits of skin-to-skin contact for the mother and baby born by cesarean section verses born vaginally?

Review of literature: Ten articles were reviewed for their literature involving skin-to-skin contact. The Researchers reported that skin-to-skin contact immediately after a cesarean birth improved maternal and newborn outcomes including better mother-baby relationship and attachment; improved effectiveness of breastfeeding, reduction of stress for both mother and baby; reduction of depression and pain perception in the mother; higher maternal satisfaction; and better temperature regulation for the newborn. The results show why it is so important to implement skin-to-skin contact, or kangaroo care, directly after birth.

Conclusions – Recommendations for practice: Finding appropriate measures to promote mother-baby relationship, attachment and health is important following a cesarean section, where the environment is different and skin-to-skin contact is a little more difficult to achieve. The studies discussed showed that skin-to-skin contact, or kangaroo care, has substantial benefits for both mother and baby, both short term and long term. For this reason, skin-to-skin contact should be implemented following a cesarean birth to receive the utmost benefits for the mother and new baby.

**Poster # 185**

**Music Therapy to Treat Agitation in Dementia: A Review of the Literature**

*Olivia A Riley, Amber Noelle Baldwin, Savannah Raine Brueher, Sara Kate Murphy, Grace Sullenger*

Students’ Department: Nursing Faculty Mentor: Thompson, Kathleen

Overview

The prevalence of patients with a diagnosis of dementia has steadily increased in recent years with the aging of the “baby-boomer” population. As more patients with dementia are placed in nursing homes, healthcare providers must become able to effectively treat dementia symptoms and complications. Agitation is a symptom that plagues the vast majority of institutionalized dementia patients, and it has proven to be difficult to treat with pharmacological interventions due to
unwarranted adverse effects from psychotropic medications. Music therapy has been studied as an alternate intervention to medication in the treatment of agitation.

The purpose of this paper is to determine whether the literature supports the use of music therapy interventions to treat dementia related agitation. The research question addressed is: Are music therapy interventions effective in decreasing agitation in dementia patients living in nursing homes, and what are current recommendations for best practice?

Conclusions - Recommendations for Practice

Music therapy may have positive effects in reducing agitation symptoms in dementia patients and should be integrated into the dementia patient’s care plan. Long term interactive music therapy sessions over the course of 6-12 weeks appeared to have the greatest effects on reducing agitation. Nurses are encouraged to integrate simple music therapy interventions into their practices.

Poster # 186

Evaluating a Novel Music Program Experience for Community-Residing Older Adults

Jordan E Riggins

Student’s Department: Nursing

Faculty Mentor: McLennon, Susan Margaret

Older adults in the community frequently suffer from psychological and physiological health issues at higher rates than the general population. Some research has found leisure activities, including music therapy, to be effective in improving various health outcomes in this group. However, optimal types and delivery methods for interventions remain unclear. A literature search was conducted in CINAHL and PubMed databases using keywords music therapy, leisure activities, older adults, and psychological and physiological health in various combinations. Sixteen articles met inclusion criteria. Findings indicated that group activities were advantageous by providing an environment to foster peer relationships with peers. Immersive interventions such as listening and focusing on the music, were therapeutic for cognitive and psychological benefits. Other leisure, sedentary activities (ex. Games, BINGO) contributed to more positive psychological and physical health perceptions in community-residing older adults. The potential for a new, novel game, SINGO, which combines music with a popular leisure activity, BINGO, will be tested in community residing older adults. State emotional status, perceived health, and demographic data will be evaluated before and after the intervention.

Poster # 187

Comparison of Observation Methods Used to Increase Hand Hygiene Compliance

Morgan E Rutanwoods, Emily Brooke Gardner, Selena R Srisourath, Micah Bailey Ashlock

Students’ Department: Nursing

Faculty Mentor: Thompson, Kathleen

Problem statement and background: Hand hygiene performance is one of the most effective and economical methods of preventing hospital acquired infections. Non-compliance is a major problem because it has been clearly demonstrated in the literature that healthcare professionals’ non-compliance with hand hygiene performance increases the rate of hospital acquired infection.

Purpose and research questions: Many methods have been used in evaluating hand hygiene compliance among healthcare professionals for decades. With the variety of methods, their effectiveness, benefits, and limitations are often studied.
Review of Literature: In order to evaluate hand hygiene compliance and its effect on hospital acquired infections, 10 peer reviewed journal articles relevant to the topic were thoroughly analyzed. Different types of measurement tools were implemented in simulated settings and acute care clinical settings to determine compliance rates of health care professionals. Both methods found that hand hygiene compliance was low, and the lack of hand hygiene compliance resulted in a higher rate of hospital acquired infections.

Conclusions—Recommendations for practice: After reviewing the literature, it’s concluded that hand hygiene is the most effective method of preventing hospital acquired infections. The use of hand hygiene is especially important because it keeps both the health care professional and the patient safe from pathogens. A few recommendations for improving hand hygiene compliance rates and decreasing hospital acquired infections is to promote the performance of hand hygiene using flyers, improve the use of hand hygiene tools, measure the compliance of hand hygiene.

Poster # 188

The Effects of Reiki Therapy on PRN Opioid Pain Medication Use Among Postoperative Patients

Meredith Leigh Simmons, Lillian Maclain Hixson, Sara Grace Jefferson, Camera Janelle Foster

Students’ Department: Nursing Faculty Mentor: Thompson, Kathleen

Opioid usage has reached crisis levels in the United States leading to increased rates of addiction, more deaths, and increased assets spent on reversing the problems associated with opioids. The amount of these prescriptions is continuously rising, thus furthering the consequential problems year by year. To decrease the amount of prescription opioids being dispersed into the public, Reiki is examined within this study as an alternative method of decreasing pain. The purpose of this study is to examine the relationship between implementation of Reiki therapy and amount of PRN opioid usage in post-operative inpatient individuals. A search was facilitated on PubMed using the key ideas of “Reiki,” “pain,” and “medication” in order to sweep the literature relevant to this subject. Since Reiki is only recently being introduced into the medical population, there were very few studies related directly to this subject. The studies that were found, with one exception, supported the idea that Reiki sessions were associated with decreased levels of pain and anxiety. Reiki seems to connect with improved patient outcomes, particularly when the patient is experiencing anxiety or pain. When patients are experiencing these things, the first response is typically to obtain opioid medications to provide patient relief. It is possible that with more utilization of Reiki as an alternative or conjunctive therapy, the amounts of opioid medications may begin to decrease. Further research is needed to find out more on the relationship between Reiki therapy and opioid pain medication utilization.

Poster # 189

Recreated Culturally Acceptable Advance Directive for Persons Experiencing Homelessness

Whitney Lynn Stone

Students’ Department: Nursing Faculty Mentor: Mixer, Sandy

Although the process of dying is a universal human experience, it often amplifies people’s unique cultural differences. Persons experiencing homelessness (PEH) have unique barriers, challenges, and wishes for end of life care. There is insufficient evidence about providing culturally congruent advance care planning (ACP) and end-of-life care for PEH. This study addressed this knowledge gap and findings serve as the basis for developing additional strategies to promote a satisfying advance care planning experience by completing an advance directive (AD). The purpose of this study was to
discover if a recreated AD for PEH would positively impact their completion of the AD as well as their overall experience with ACP. Guided by the culture care theory and qualitative ethnonursing methodology, 38 participants (30 persons experiencing homelessness and 8 student nurses) were interviewed. Data was analyzed using the four phases of ethnonursing analysis. Themes abstracted are; PEH feel that an AD "needs to be done," ACP can be facilitated through an AD workshop with student nurses, and the recreated AD was culturally acceptable for PEH. Recommended nursing interventions promote a dignified, meaningful ACP experience for vulnerable populations.

Poster # 190

Shift Work and Its Impact on Nurse Health (Obesity and Fatigue)

Emily Grace Spence, Marcy Caitlin Spikes, Augustus James Osgood, Daniel S Linebaugh, Copeland Taylor Cobb

Student’s Department: Nursing Faculty Mentor: Thompson, Kathleen

Problem statement and background: Nurses face many challenges and negative influences in their professional career that can potentially affect their personal health in many different ways. Examples include obesity, fatigue, injuries, aging, and chronic diseases. Shift work, a common type of schedule for nursing professionals, can negatively affect the nurse’s health. While this is a relevant problem for the nurse’s well-being, his or her poor health can also affect patient health and the hospital’s proficiency. Purpose and research questions: The purpose of this evidence-based project was to investigate the effects of shift work in hospitals on nurse health, specifically obesity and fatigue. The following research question was considered: what effects does shift work in hospitals have on nurse obesity and fatigue?

Review of literature: The results found from numerous studies suggested that shift work did influence nurse health. Specifically for obesity, studies suggested that it was a common problem among nurses and that factors like longer shifts and night shifts increased its prevalence. Studies explained that this work schedule altered the amount of time nurses had to prepare and consume meals, exercise, and choose proper nutrition. Furthermore, studies implied that shift work caused poor sleep quality, difficulty sleeping, and odd sleep hours, leading to fatigue in nurses. Again, longer shifts and night shifts seemed to cause the highest prevalence of this job-related stress.

Conclusions—Recommendations for practice:

Decreasing the negative effects of shift work on nurse’s health is important to ensure nurse well-being, safe patient care, and efficient hospital systems. The studies that were analyzed suggested that shift work did increase nurse obesity and fatigue. Because of this, various strategies and plans were recommended. They included the following: further research, education about the risks of shift work, regular health check-ups, and different shift scheduling specific to the nurse’s needs.

Poster # 191

Needs and Concerns of Individuals in the Medicaid Gap

Meredith D Hudson

Student’s Department: Nursing Faculty Mentor: Myers, Carole R

One goal of the Affordable Care Act (ACA), signed into law in 2010, was to provide healthcare coverage to as many Americans as possible. Indeed, Americans more than ever have access to some kind of health coverage. However, over
163,000 Tennesseans are currently without health insurance because of the state’s decision not to expand Medicaid, an optional provision of the ACA. These Tennesseans are stuck in what is referred to as the Medicaid Gap. They do not qualify for Medicaid based on their income level. These same people would qualify if the state elected to expand Medicaid. The purpose of this study is to describe the perspectives and experiences of Tennessee adults who have been in the Medicaid Gap for at least six consecutive months. Personal interviews with adults in the Medicaid Gap will be used to gain in-depth knowledge regarding experiences related to healthcare access. Recordings of interviews will be recorded and analyzed by the Honors student and faculty mentor. Themes from the interviews will be derived from the interview data. There are no findings at this time. Results from this study may be utilized to inform public policy regarding healthcare access and utilization.

Poster # 192

The Effects of Step Tracking on Obesity in Nurses: A Literature Review

Alexandra Morgan Stewart, Emily M Banks, Linzi Delaney Mcconnell, Kathleen B Hill

Student’s Department: Nursing

Faculty Mentor: Thompson, Kathleen

Problem statement and background: Obesity is an issue faced by many nurses and healthcare professionals. This is a concern because obesity is detrimental to the health of nurses and the patients they care for. The nursing profession itself is heavily focused on health promotion and when nurses are unable to maintain healthy habits, a negative example is set for their peers and patients. Statistics regarding the prevalence and incidence of obesity show the significance of this problem among the nursing profession.

Purpose and research questions: The purpose of this evidence based project was to explore the effects of positive self-care behaviors and increasing the number of steps per day, with the implementation of a step tracking device, on weight management in the nursing population. The research question considered was: In BSN nurses, what are the effects of step tracking (through a FitBit/tracking device) and offering incentives for exercise on weight loss and BMI compared with a similar unit in the same facility within 6-12 months?

Review of Literature: The results found among various studies indicated that obesity is a prevalent problem in practicing nurses and interventions must be implemented to decrease the growing pandemic. These studies assessed nurses’ knowledge on the topic of obesity and the importance of discussing this health detriment with patients. The results also showed that obesity in the nursing population can affect the care they give. One intervention assessed was the use of a step tracking device and implementation of a walking program to increase physical movement and encourage nurses to use positive self-care behaviors. The results of this study concluded that this intervention can decrease weight in the nursing profession and create incentives to maintain a healthy lifestyle.

Conclusions—Recommendations for practice: Finding appropriate measures to reduce obesity in nurses is critical to maintain a high standard of care for patients and reduce the detrimental outcomes of obesity in obese or overweight nurses. The studies discussed indicated that step tracking participation and incorporating positive self-care behaviors resulted in significant reductions of weight and the promotion of healthy habits. For this reason, step tracking devices should be utilized in the nursing profession.
Stigma in Persons with Mild Cognitive Impairment and their Caregivers

Brianna Fiala,

Student’s Department: Nursing  Faculty Mentor: Rose, Karen Moomaw

Over 5 million Americans are living with Alzheimer’s disease and related disorders (ADRD) today; 15 to 20% of people 65 years or older also have mild cognitive impairment (MCI), often a precursor to ADRD. One of the major issues that persons with ADRD and their caregivers encounter is stigma. Stigma influences decisions to access care or make use of supportive resources. However, it is unknown if stigma is experienced in persons with MCI and in their caregivers. Thus, the purpose of this study is to describe stigma in persons with MCI and in their caregivers. The design of this study is multiple methods. Quantitative data will be obtained using the stigma impact scale, CES-D to measure depressive symptoms, and the 18-item rating anxiety in dementia (RAID) scale to measure anxiety. Qualitative data will be obtained via individual study participant interviews to gain knowledge regarding perceptions of stigma in those persons with MCI and their caregivers. Audio-recorded interviews will be transcribed and placed in NVivo software for analysis; themes will be identified. There are no study findings yet as this is ongoing. Results from this study will be target interventions to reduce stigma in persons with MCI and their caregivers.

Evaluating the effectiveness of the SBIRT assessment tool for identifying opioid substance abuse in women of reproductive age

Elena Jean Stewart, Claudia N Segovia, Chikaosoro E Igwe

Student’s Department: Nursing  Faculty Mentor: Thompson, Kathleen

Objective:

To evaluate the effectiveness of Screening, Brief Intervention, and Referral to Treatment (SBIRT) tool in identifying opioid substance abuse in women of reproductive age (15-44 years old) to reduce the unintended incidence of NAS newborns.

Methods:

We conducted a literature search for evidence using Google Scholar, PubMed, CINAHL complete, Medline (OVID) and The Cochrane Library. The following key words were used: substance-related disorders, opioid abuse, women and opioid abuse, mass screening, pregnancy complications, clinic/emergency department, opioid assessment, pregnancy, prenatal care, cocaine, cannabis, opioid, tobacco. Search results were screened for relevancy using set exclusion and inclusion criteria. We included articles that were studying women with opioid abuse and opioid abuse being assessed in a clinical setting such as an emergency room or community clinic. Of the articles chosen we had systematic reviews, meta-analysis articles and randomized control trials/controlled clinical trials.

Results

Results show that the use of the SBIRT assessment tool helps patients who at risk to increase their access to resources and to decrease rates of substance abuse. Longitudinal studies show that improved access to health care and assistance with appropriate addiction care leads to reduced health care costs and decreased maternal and neonatal morbidity and mortality.
Conclusion

The SBIRT tool is a viable instrument to use in the clinical setting and it has been validated through several randomized control studies indicating its success in reducing the rate of substance abuse such as illicit drugs and alcohol.

Poster # 195

Western Medicine and Non-traditional Treatment of Pain in the Laboring Woman

Madison Mckenzie Taylor,

Student’s Department: Nursing  Faculty Mentor: Taylor, Sheila Lynn

Of the 353,000 babies born every day to laboring mothers, physical and psychological pain is an inevitable aspect of the birthing process that healthcare providers seek to combat with a variety of labor interventions. However, these women are often directed by these professionals to use drug-related interventions such as epidurals for pain management instead of being presented with all available alternatives, which detracts from the individualization of this process. Forty references were identified and amalgamated to construct a complete review of literature; PubMed and CINHAL databases were exploited using key words such as “non-pharmacological interventions,” “labor,” “women,” “pharmacological interventions,” “pain management,” and “stress.” Researchers indicate a beneficial relationship between numerous non-pharmacological interventions and the relief of physical pain as well as psychological and emotional stresses. Additionally, scientific studies demonstrate unfavorable, adverse effects epidurals elicit on women’s physical, psychological, and financial aspects of life. Identified as a significant gap in the literature is the lack of knowledge of different interventions and their actual use for treatment of labor pain. Future research findings will continue to assess women’s knowledge, utilize findings to educate about the variety of pain management options, and aid in determining which interventions are best for individual labor experience.

Poster # 196

Kangaroo Care and its Impact on Infant Weight Gain and Length of Hospital Stay

Virginia Jean Williams, Leila Yasmeen Bangash, Sarah A Stone, Aziza Ismoilova, Sophie C Wilk, Rachel Kennedy Depriest

Student’s Department: Nursing  Faculty Mentor: Thompson, Kathleen

Problem statement and background: Adequate weight gain in preterm or low birthweight (LBW) infants is a critical component of healthy postnatal development. LBW has been linked to poor outcomes. It is important that cost-effective alternatives to traditional neonatal care, especially in developing countries.

Purpose and research questions: The purpose of this project was to explore the effect of Kangaroo Mother Care (KMC) on increasing weight gain and decreasing length of hospital stay. The following research question was considered: In low birth weight neonates born, what is the effect of KMC on weight gain and length of stay?

Review of Literature: The results of twelve studies indicated that Kangaroo Mother Care is superior to conventional methods of care (CMC) in that it produced equivalent or enhanced care of neonates.

Conclusions -- Recommendations for practice: Finding more cost-effective alternatives to CMC is critical for the improvement of mortality and morbidity rates globally. The studies discussed exhibited that not only is KMC equal or even superior to CMC, but it also lessens stress put on families. For this reason, KMC should be implemented as the standard of care in hospitals worldwide.
Poster # 197
Assessing Prenatal Nutritional Information Access, Sources, and Habits in East Tennessee

Bailey Mckenna Akins,

Student’s Department: Nursing
Faculty Mentor: Taylor, Sheila Lynn

Maternal action directly affects the life of the developing fetus in the womb. Therefore, understanding maternal health decisions is a critical foundation for improving fetal health in East Tennessee. A review of the literature utilizing Pubmed and CINAHL databases revealed that limited data exists regarding the educational resources given to pregnant women seeking care in Tennessee. The most relevant data on this topic comes from Australia; researchers identified that women mainly received prenatal information from their healthcare provider, media, social networks, and family or friends, but the prenatal information from their health care provider often did not meet their needs. Future research will holistically explore women’s knowledge, their sources of recommendation on exercise, weight gain, and nutritional practices during pregnancy, and their compliance.

Poster # 198
Neonatal Abstinence Syndrome Treatment Protocols and Long-Term Deficits

Mallory C Lanier, Caroline Grace Carter

Student’s Department: Nursing
Faculty Mentor: Tourville, Jennifer Gale

Neonatal Abstinence Syndrome (NAS) is a form of withdrawal in neonates caused by substance abuse during pregnancy and the abrupt discontinuation after birth, requiring treatment in a Neonatal Intensive Care Unit (NICU). The incidence of NAS increases tenfold annually in Tennessee, resulting in an alarming number of infants requiring NICU care and frequent follow-up assessments for long-term deficits during early childhood. To improve the health of neonates diagnosed with NAS, treatment protocols and long-term complications should be investigated. A literature review using a PubMed search with the keywords “Neonatal Abstinence Syndrome,” “treatment protocol,” and “follow-up care” yielded fifty journal articles. After synthesizing these articles, it was found that although most NICUs utilize the same medications to treat NAS, there is a lack of a standardized approach to medication weaning resulting in various lengths of NICU stay. Another identified gap in the research is a lack of standardized or required follow-up care for infants discharged from the NICU following NAS treatment. Further research could identify an effective treatment regimen that could decrease the NICU length of stay and optimize neonatal outcomes. Additionally, a regulated follow up process may assist with early diagnosis and interventions for long-term NAS complications.

Poster # 199
A Technological Platform for Decentralized Response to Reproductive Health Disparities: From Innovation to Community Support

Abigail S Geater,

Student’s Department: Social Work
Faculty Mentor: Berenstain, Nora

Katie was designed as a culturally appropriate resource staffed by local volunteers who were experts in the lay of the land and the type of help needed to access reproductive healthcare in Appalachia. Developed in coordination with The
Knoxville Abortion Doula Collective, this innovative communications platform “Katie” gives organizations a unique way to tackle outreach and provide community support. Originally conceived as a technology to address disparities in abortion access and provide people seeking abortion with logistical, practical, financial, and emotional support, Katie provides the opportunity to serve a wide variety of stigmatized and marginalized communities (immigrants and refugees, LGBTQIA+, etc), as well as offering free and anonymous emergency counseling and resource brokering following traumas or natural disasters. Katie is an innovative and practical platform that serves to decrease abortion stigma by tackling barriers to reproductive health disparities and providing a decentralized response to these issues at the community level.

College of Social Work

Poster # 200

Macrolevel Preventive Indicators of Maternal Incarceration Rates in Tennessee

Abigail S Geater,

Student’s Department: Social Work

Faculty Mentor: Choi, Sunha

Research shows that despite making up only 10% of the prison population in the United States, women represent the fastest growing population within the county jail and state and federal prison population. Despite this growth, there has been little research that explores the relationship between macrolevel preventive indicators and maternal incarceration rates. This study aimed to analyze these macrolevel data in correlation to the maternal incarceration rate across 23 county jails served by the Criminal Justice Liaison Program in Tennessee. The mean number of incarcerated mothers per county facility was 56, with the maximum of 166. Incarcerated mothers represented 6.2% of the total jail population and 55 % of the total female population in the sample in June 2017. The macro level variables used to interpret these county-level variations included: HIV rate, live births/deaths, marriage and divorce rate, adolescent pregnancy, population, employment rate, poverty level, high school graduation rate, income, number of people in the labor force, occupied housing rate, and average property value. This study is expected to provide an increased knowledge of gender specific preventive indicators that may be targeted to avert pregnant and parenting women from the criminal justice system in Tennessee.

Poster # 201

Characteristics US Children Entering Foster Care

Amber Hale,

Student’s Department: Social Work

Faculty Mentor: Choi, Sunha

Foster Care is the system in which children are taken out of the custody of their parents, usually due to parental neglect or abuse. While this does remove the child from a dangerous environment, the trauma associated with being removed from their parents can have negative impacts on a child’s life. Unfortunately, the number of children entering foster care has increased in the United States. This study was conducted to better understand the state-level variations in the age, gender, and race profile of those children who entered foster care between 2013 and 2015. State-level public data from 50 states and Washington DC collected by the KIDS COUNT data center and U.S. Census Bureau was analyzed using SPSS. State-level variables tested to explain the differences in demographic profiles of children entering foster care in each state included: % of Caucasian, % of poverty, % of unemployed, and % of female-headed households. The findings of this study
will assist states in assessing disparities so that improvements in interventions and policies can be created. Understanding the correlation between societal issues and children admitted into foster care can help to provide more effective policies before bringing a child into foster care, lessening the risk of trauma due to the separation from caregivers.

**Poster # 202**

**The Population Characteristics of Children Served by a School-Based Interprofessional Clinic**

*Sarah Henson,*

Student’s Department: Social Work  
Faculty Mentor: Choi, Sunha

A local school-based interprofessional clinic was founded by the University of Tennessee to provide medical services (physicals, wellness check-ups, sick visits) and social work services (therapy, case management, mental health evaluations, insurance applications, resourcing) to underserved children in Knox County Schools. To evaluate this program goal, this study analyzed data from the agency’s Permission to Treat form (PTT) from the linked school-level public data. The PTT is signed by each client prior to receiving services, and this study includes all clients who received services between August 1, 2016 and July 31, 2017 (approximately 2,500 clients). Variables examined from the PTT include: client age, grade level, school, gender, guardian’s age, custody status, insurance status, free/reduced lunch status, and mental health/education problems. Data analysis was conducted using SPSS. This study will help measure effectiveness of the clinic’s ability to serve the target population, identify potential gaps in services, and establish the value of the clinic to students, families, and community members. Additionally, understanding demographics of the client population in the context of school, county, and state demographics will help the clinic improve the PTT form, increasing effectiveness of client-reported data for future program evaluation efforts.

**Poster # 203**

**Spiritual Practices and Education of End-of-Life Care Professionals**

*Olivia C Seay,*

Student’s Department: Social Work  
Faculty Mentor: Choi, Sunha

The preponderance of research indicates that patients have spiritual needs at the end of life, and end-of-life professionals, especially documented with social workers and nurses, deal with spiritual issues frequently, including helping clients examine their beliefs about loss, assessing clients’ religious/spiritual background, and helping clients use their spirituality as a coping mechanism. However, current literature shows that professional education often leaves spiritual interventions out of the curriculum, creating a gap in education and preparedness for field work. This study examined whether or not the inclusion of spirituality in professional education predicts the level to which members of different disciplines engage in spiritual care with their clients. An anonymous paper survey was disseminated to approximately 250 staff and volunteers of an East Tennessee agency that provides home health and hospice care. This survey assessed multiple variables, including job title, length of time working in end-of-life care, spiritual practices with clients, and education regarding spirituality. Results of the survey were manually entered into SPSS and analyzed in order to examine the relationship between spiritual practices and spiritual education across different professions. Understanding this relationship will enable volunteers and practitioners in the hospice field to provide holistic care to patients.
Poster # 204

Child Welfare Professionals’ Attitudes and Knowledgeability on serving LGBTQ+ Youth

Ashlie Denise Seibers,

Student’s Department: Social Work, Faculty Mentor: Choi, Sunha

While the exact number of LGBTQ+ youth in the child welfare system is unknown, it has been estimated that LGBTQ+ youth are disproportionately overrepresented in the child welfare system, with some estimates ranging from 5 to 10% of all foster care children. The unique needs of this population are commonly overlooked by a system that has largely been unresponsive in implementing standards of care to meet their needs. The purposes of this study were to assess the general attitudes and knowledgeability of Child Welfare Professionals, and to examine their agencies’ policies/practices on serving LGBTQ+ youth. To achieve these goals, an anonymous online survey was distributed to the members of professional organizations, such as the National Association of Child Advocacy Centers and Casey Family Programs via Facebook and LinkedIn. The survey questions asked about employee’s knowledge/attitudes on serving LGBTQ+ youth, educational satisfaction, and various agency characteristics regarding serving the target population. Univariate and Bivariate statistics were conducted with SPSS to assess the knowledgeability of child welfare professionals and practice standards of child welfare agencies. This study is expected to provide insight into the perceived strength/needs of child welfare professionals serving LGBTQ+ youth.

College of Communication and Information

Poster # 205

Using Meisenbach’s Typology to Classify Stigma Management Strategies and their Lasting Effects

Lia Marjorie Lombino, Jamie Eden Shapiro

Student’s Department: Communication, Faculty Mentor: Crowley, Jenny

There are certain traits people possess that lead to stigmatization and mistreatment by others. A stigma is traditionally defined as an identity discrediting mark on someone of questionable moral status (Goffman, 1963). Despite extensive research on stigma, there is an absence of research that studies the role of communication in stigma and the impact of utilizing different communicative strategies when managing stigma. The purpose of the current study is to validate Meisenbach’s (2010) typology of stigma management communication, which is based on accepting or challenging personal and private stigma. Meisenbach proposes four different stigma management strategies: accepting the stigma, evading/reducing the offensiveness of the stigmatized trait, avoiding, and rejecting the stigma. The study also extends Meisenbach’s (2010) typology by determining the lasting effects of stigma management strategies, by investigating whether stigma management strategies correspond with people feeling better or worse following a supportive conversation. Participants (N = 203) engaged in supportive conversations about a stigmatized trait with a confederate. Two coders analyzed the conversations to determine the category of typology used. The results of this study support Meisenbach’s (2010) theory and provide practical implications, such as suggestions for identity management for someone coping with a stigmatized trait.
Poster # 206

Implementing Social Support Towards the Nutritional Needs of College Freshmen

Elle Peggy Johnson,

Student’s Department: College Scholars Program Faculty Mentor: Miller, Laura

Based on the trope of the “Freshman 15,” nutrition is a prevalent issue for college freshmen that can have short-term and long-term consequences. Evidence indicates that social support is a valuable communicative tool for supporting nutrition, but little research has been conducted on the vulnerable college freshmen population. The present investigation seeks to explore the current role that social support plays in college freshmen eating habits, where freshmen are receiving this support and what barriers exist to giving or receiving social support in the college setting. In-depth interviews with 30 college freshmen were conducted to explore the role of social support in encouraging student nutrition. A constant comparative analytic method, including grounded theory techniques, was used to analyze the qualitative data in order to better organize and synthesize the prominent emergent themes. The results indicate that college freshmen receive unique forms of social support from both parental and peer sources that influence their overall nutrition outcomes. However, despite positive intentions, some forms of social support regarding nutrition are perceived by college freshmen as being unproductive and unhelpful, affecting their willingness to seek support when needed. Implications of these findings for supporting healthy communication with college freshmen and identifying possible outlets for university programming and policies will be discussed.

Honors English 298 – College of Arts & Sciences

Poster # 207

Columbus Day: Should it be Celebrated?

Alexander, Mckenna Lauren

A Classroom Project for English 298 Faculty Mentor: Gentry, Elizabeth Leigh

There is both support and skepticism amongst the scholarly and non-academic community in response to the celebration of Columbus Day. This skepticism arises because of Columbus’ actions after his arrival including rape, genocide, and looting throughout the Caribbean. Although some still believe that Columbus was a great explorer and a significant reason why European descendant are in America today, others believe that Columbus Day should not be celebrated as a National Holiday because of his corruption and mistreatment of Indigenous people. Not only has Columbus been both an inspiration and a curse to many Americans, his actions also have modern negative repercussions such as the continuous racism inflicted upon the Native American community. It can be argued that a new national holiday should be implemented to celebrate the Indigenous peoples of North and South America because they were the victims of the genocide catalyzed by Columbus.

Poster # 208

The Decline in Trust in the US Media: A Qualitative Study

Anderson, Joseph Harris

A Classroom Project for English 298 Faculty Mentor: Brouwers, Marcel
The trust in the United States media has greatly declined in recent years due to large media corporations releasing articles containing false information. A step in determining the factors that lead to distrust is research done on students at the University of Tennessee to gain their insight on the matter. Researchers will conduct a survey answering questions on where students learn their information, their political leanings, and their trust in the media. The level of trust in the media will be compared with the political leanings of people and the medium in which they find their news. From the collected surveys, a conclusion can be drawn regarding the relevance of April Fool’s Day in the declining trust in the news. The group sampled had no clear correlation between trust and being tricked by a prank of the media on April Fool’s Day.

**Poster # 209**

**Thick as Fleas on a Dog’s Back: Appalachian-isms, Intelligence, and Employability**

Anderson, Westena Baylee

A Classroom Project for English 298

Faculty Mentor: Addicott, Randi Marie

This paper focuses on an analysis of Appalachian English vernacular in relation to the perceived intelligence of its speakers. Appalachian English has historically been regarded as a dialect of ignorance and unintelligence, and the purpose of this investigation is to determine why the prejudice exists and how this translates into the real world. This is done with the hopes of facilitating discussion about what can be done to aid in combating the stigma of Appalachian English, but can be extended to encompass virtually any non-standard dialect, due to the congruences between the perceptions of different vernaculars. Research shifted to answering the question “Why is Appalachian English considered so unintelligent and how does it affect the lives of its speakers?” The conclusion is the perception of unintelligence is a result of a systematic abuse of power, whether that be in the standard form of a distinct entity in power manipulating its dependents, or of less conventional forms, such as media, socialization, or employability.

**Poster # 210**

**Incentivizing Pharmaceutical Companies:**

**Comparing Different Incentive Mechanisms’ Effects on Researching Understudied Diseases**

Apostoaei, Alec Victor

A Classroom Project for English 298

Faculty Mentor: Gentry, Elizabeth Leigh

Pharmaceutical companies have long been the facilities leading research and development for innovative medications. Due to their dedication to profit, these companies struggle to sustain research for treatments focused on orphan diseases. Orphan diseases, defined by the fact that they affect fewer than 200,000 Americans, still ravage developing countries. They affect many people outside of this nation, and in addition, these diseases have the possibility to eventually spread to the United States and turn into an epidemic. Due to the lack of diagnoses in the United States, the market for pharmaceuticals treating orphan diseases is not expansive. The two main ways the government can incentivize pharmaceutical companies to research and develop more treatments are through push and pull incentive programs. Hybridizing the two incentive mechanisms can entice pharmaceutical companies to focus on the research and development of drugs that can treat orphan diseases in order to assist developing countries and prevent a possible epidemic.
Poster # 211

Effects of Paying College Athletes

Aspden, Chase Matthew

A Classroom Project for English 298  Faculty Mentor: Dean, Lance M

Numerous accounts of research argue whether or not college athletes should receive extra compensation on top of the scholarships they receive. This article, however, looks at the positive and negative effects that would come from paying college athletes. This study examines how paying college athletes would affect student-athlete graduation rate, athletes’ participation in class, and the recruitment process. By studying the effects of athletes receiving extra compensation, the results will show if it is best for them to receive extra money or not. First, secondary sources were analyzed to learn the most common effects paying athletes would have. Then, two college athletes and one professional athlete were interviewed. Each athlete was asked the same series of ten questions. After the three interviews were conducted, the athletes’ responses were compared to the findings from the secondary sources. The results conclude that athletes would not be more motivated to stay and graduate if they were to be paid. Therefore, there are not many positive effects that come from paying college athletes.

Poster # 212

The Effects of a Tuition-Free College Education

Baek, Eunice Jiseung

A Classroom Project for English 298  Faculty Mentor: Dean, Lance M

Recent college graduates are struggling to find jobs in the workforce while trying to settle their student debt. The proposition of a tuition-free four-year college has been in discussion since the mid-1900s and until now, only one state, in all of America has implemented it. Funding is scarce when it comes to education, depending on what state and national legislatures decide to implement, but House Representatives and Senate leaders are working towards a more unilateral system to find the best way to use state and government taxes for this issue. The state of Tennessee has already implemented what is called the Tennessee Promise, where students, if eligible, are able to attend community colleges around the state, tuition-free, for at least two years. This encourages recent high school graduates to pursue their education and attend post-secondary school for at least for two more years until they have enough support and money to attend for the next years. Seeing as the outcome would leave graduates with less debt, interviews I conducted and secondary sources I have reviewed show that there will be a positive change to the United States’ view on higher education as a whole, as it would motivate individuals who cannot afford to spend thousands of dollars to continue their education and shift the workforce into the educational fields which would benefit the American economy.

Poster # 213

Why the University of Tennessee Should Produce its own Biodiesel

Baird, Aidan L

A Classroom Project for English 298  Faculty Mentor: Newburn, Harry Fredrick

As the 21st century progresses, energy is a key factor into scientific development. As of now, fossil fuels are a supply of this energy in the United States. These fuels however are inefficient, are in limited supply, and contribute to global climate
change. Many feel that biofuels can help serve as a replacement for these fossil fuels because they are more efficient and can produced with materials that have a near limitless supply. A major use of fossil fuels is in transportation. Many commercial and industrial vehicles rely on diesel fuel. Biodiesel is an alternative fuel that can be produced easily and can be used to in regular diesel engines.

I am analyzing how the University of Tennessee can encourage biodiesel usage, especially in the area of East Tennessee. Biodiesel is fundamentally cheaper than diesel to produce, however after accounting for associated costs that can often accompany it, can be more expensive. There was previously a biodiesel production program here, but it collapsed. I looked at why this happened and why it may succeed now. The university can set a precedent throughout the area for usage, and in addition to providing critical research into the area, it can provide a key role in providing the proper training and research so that biodiesel can become profitable and accessible for widespread use.

**Poster # 214**

**Current Environmental Standards on the Impact of Systemic Discrimination by Improper Waste Disposal**

Baljepally, Vinila S

A Classroom Project for English 298  
Faculty Mentor: Addicott, Randi Marie

For decades, movements of different types have lead to great change in our nation. Even though the environmental movement started in the 1960s and 1970s, the need for correction towards environmental racism has never been properly addressed. In the past half century alone, numerous incidents of improper waste disposal into water bodies by various corporations have gone unreported and ignored by powerful corporations, the Environmental Protection Agency (EPA), and Congress primarily because those affected are impoverished and of a minority status. Despite improvements regarding stronger governmental regulations, the damage companies have subjected to these specific communities has led to hundreds of injuries, fatalities, and destruction of the environment. A main way this prejudice continues is through companies looking for easy, cheap methods which consistently affect areas of large moneyless minority populations.

**Poster # 215**

**Peeling Back the Layers: The Effect of the Onion and Other News Satire on the Political Attitudes of Students**

Banick, Mary Margaret

A Classroom Project for English 298  
Faculty Mentor: Nicks, Robin Jean Gray

According to S. A. McClennen an R. M. Maisel (2014), more millennials are turning towards nontraditional forms of news in order to establish their attitudes towards politics. With this increase in popularity, more young people are viewing humorous political sites as opposed to traditional news outlets, and this is having an effect on their political attitudes and political participation. There is a fair amount of research on the effects of political and news satire on viewers, though many fail to take into account interpretation as an explanation of why even mockery of one’s own political affiliation could still result in the strengthening of this affiliation. By taking this into account, we can gain a better understanding of the major effects of this popular outlet of entertainment. This study examines the extent in which political satire strengthens previously held political attitudes and how much this affirmation is a result of one’s interpretation of the satire piece. The study analyzes information from three interviews with both men and women aged 18 to 24 in the Chancellor’s Honors Program at the University of Tennessee during the Spring 2018 semester. The results show a correlation between one’s interpretation of the purpose of the mockery and the maintenance or strengthening of pre-existing political attitudes and affiliations.
Poster # 216
The Effects of Gender Inequality on Power, Social Structure, and the Development of Relationships
Barkeloo-Carter, Audrey Katelynn
A Classroom Project for English 298 Faculty Mentor: Addicott, Randi

Gender inequality was a very prevalent issue throughout history in many different cultures, and is still present in many cultures today. The most often seen forms of gender inequality are inequality in marriage, wage and labor discrimination, and political discrimination. Gender discriminations can have a serious negative effect on society’s perception of power, the way society functions, and the way relationships between males and females are formed. Stress within relationships can create a hostile environment for the growth of a functional society and a balanced power structure. Gender inequality can have negative psychological effects victims of gender discriminations, usually women. Psychological damage can be detrimental to not only the victim of discrimination, but also the way that person functions in society and forms relationships with other people.

Poster # 217
Ghostwriting: The Truth Behind Authorship
Barnhill, Bailey R
A Classroom Project for English 298 Faculty Mentor: Barrow, Robin

This is a classroom project for English 298. Ghostwriting is when someone takes credit for another person’s literary work and has been a concept in literature ever since people began writing their ideas down. Since then, ghostwriting has become a very controversial subject throughout the different fields of literature, especially when these ghostwriters began getting paid. These different fields include the academics, politics, medicine, music, and many more. In this paper, I intend to investigate different instances of ghostwriting in the academic and medical fields by conducting secondary source research and interviewing English professors. My research and interview questions primarily focused on why ghostwriting is a problem in today’s society. The main problem in the academic field is that college students who get away with ghostwriting graduate with a degree earned from someone else’s work, thereby lowering it’s value; in the medical field, ghostwriting transfers accountability and responsibility to the wrong authors.

Poster # 218
Effective Marketing and Benefits of Study Abroad Programs
Barre, Faith Olivia
A Classroom Project for English 298 Faculty Mentor: Newburn, Harry Fredrick

With increased focus on the benefits of study abroad programs, countless college students across the country are investing in overseas experiences each year. Not only does a study abroad program improve language proficiency and cultural knowledge, but it allows students to gain the necessary skills for greater success in their future careers. Although many studies have been done on this fact, emphasis on effective marketing strategies and the search process is vital to the success of each university’s study abroad programs. The objective of this research is to determine the key factors and benefits that students use when deciding on a study abroad, such as world experience or scholarships, and to assess the
University of Tennessee’s effectiveness at encouraging their students to attend a program in another country. Though these results reveal many great aspects of a study abroad, inconsistencies were found in the interview data. While the study abroad advisor and language professor agreed on the effectiveness of the Center for International Education to assist students during every step of the process, a student who recently studied abroad stated that her process was increasingly less guided the closer she got to the actual program. In order for this disconnect to be resolved, the University of Tennessee must work to better encourage students to spend time abroad and to assure them that trustworthy coordinators will be there throughout the entire planning process.

Poster # 219

A classroom project for English 298: Female Gender Roles in the First Disney Princess Movie: To what extent does Disney’s Snow White and the Seven Dwarves reinforce restrictive feminine ideals?

Bell, Olivia Marie

A Classroom Project for English 298

Faculty Mentor: Newburn, Harry Fredrick

Gender roles have been around for as long as civilized society. Going back as far as ancient Greece, one can see how the gender roles of 5th century Athens influenced the literature being produced then. The art of the 1930s is no different in that it, too, strongly reflected the gender roles shaped by the Great Depression. There is still this continuation of art and literature reflecting gender roles today as parents worry how portrayals of strict gender roles affect the psyches of their children. Because Disney has largely monopolized the media that most children consume, this study explores the extent to which Disney’s *Snow White and the Seven Dwarves* (produced in 1937) reinforces restrictive feminine idealism in order to gain insight as to how the gender roles portrayed in the film reflect the culture of the 1930s, inform readers of the consequences of watching similar films, and offer suggestions for future Disney movies while also revealing some of the long term effects of these depictions. The study concludes that although the gender roles represented in Disney’s *Snow White and the seven dwarves* are extremely restrictive, there is hope for future Disney movies. Furthermore, it is not necessarily the content of the movie that matters, but rather the ideals that parents instill in their children because it will change how they view varying characters’ situations; though, Disney should continue to be mindful and more deliberate about the gender roles that it portrays.

Poster # 220

Music to My Brain: Music’s Role as a Therapeutic Tool with Relation to Mood and Personality

Benson, Eric Bradley

A Classroom Project for English 298

Faculty Mentor: Gentry, Elizabeth Leigh

Very little is known about the role music plays in neurocognitive processes, though sensory information processing is a large part of the brain’s function. A new and exciting field of neuropsychological research is music’s relationship with the cognitive processes of mood, personality, and behavior. One study performed on Dutch adolescents suggests that there is a correlation between music and personality traits. The research team believes that this is based on the “uses and gratifications” certain people get from certain types of music, which is extremely useful insight for therapy. Understanding a person’s psychological needs will make treatment of mental illness much more effective on an individual basis. Another study found that calming music is useful for treating mild stress, which would be an effective stepping stone in treating
larger psychological issues. These studies and others like them demonstrate that music is extremely useful for treating issues with which millions of Americans struggle, which is promising for the future of therapeutic research.

Poster # 221

On English Loanwords in the Spanish Language

Bess, Daniel P
A Classroom Project for English 298
Faculty Mentor: Newburn, Harry Fredrick

Because of the increase in interconnectivity due to globalization, there is an increase in interaction between peoples who speak different languages. As a result, one language often borrows words from another, and the results are called loanwords. These loanwords the key to understanding how languages interact in a globalized world because they are the result of interlingual communication. Though extensive analysis of secondary research, it has been determined that English loanwords in Spanish are used a great deal in academic fields and might influence Spanish-speaking people’s view of English as a language. Still, some of the loanwords are also the source of confusion because they are hard to fit into Spanish grammar, which could also affect how English appears to Spanish-speakers. It as also been determined that various regions have reacted differently to English loanwords, but they have used loanwords so frequently that the subdialects from some regions are distinguishable from the original Spanish. From this one can conclude that loanwords are a sign that Spanish is becoming more similar to English. Through interviews with people who speak Spanish for their, this study determines that loanwords play an important role in learning a language, either helping or hindering a student. The combined results of this research is knowing and understanding how modern languages are interacting and changing, where those interactions are taking place, how people respond to them, and what the affects of the interactions are.

Poster # 222

Canine Breed-Based Policy:

how Aggression Stereotypes Influence them and how they Need to be Revised

Black, Marlo
A Classroom Project for English 298
Faculty Mentor: Murphy, Samantha Ann

Canine breed stereotyping is exceptionally present in society due to its prominence in media and popular culture. Specifically, breed-based aggression stereotyping has made breed-based legislation and restrictions for acceptable dog breeds at residencies prominent in many countries. Unfortunately, these restrictions/regulations are unjust to numerous dog breeds - especially when scientific studies have shown that legislated dog breeds are not more aggressive or harmful than non-legislated breeds. While breed-based policy faults in many ways, it can benefit communities by combating canine overpopulation (when the spaying and neutering of specific breeds is mandated) and providing a sense of security for the community. As a whole, breed-based regulations and restrictions can contribute positively to society, but they desperately need revision. Since these policies are based on breed aggression stereotypes and not necessarily supported research on what causes canines to be aggressive, these policies repeatedly penalize non-aggressive pets and their owners but neglect to protect members of society from canines that can and will inflict harm. This report reviews what factors truly make canines aggressive, what is successful and not successful in existing breed-based policies, what differences exist between legislated and non-legislated breeds, and how exactly these policies need to be revised.
Poster # 223

How Darwin's Theory of Evolution Divided Scientific and Christian Worldviews

Blokland, Lara Suzanne

A Classroom Project for English 298

Scientific and Christian worldviews have come into conflict with each other many times throughout history, with one of the most well-known conflicts being Darwin’s theory of evolution as understood in the United States. While many Christian denominations accepted the theory, there are several that rejected it, and this rejection has contributed to the divide between science and religion in the minds of many people. The reception of Darwin’s theory of evolution by religious groups has been extensively studied, however much of the literature is focused on the present-day conflict. This project examines the reasons why Christian groups in the United States initially rejected Darwin’s theory, as well as why other theories, even those also concerning the origin of life, were not as offensive in a religious context. By doing so, this project demonstrates why Darwin’s theory was a catalyst in the conflict between science and Christianity. Darwin’s theory of evolution contributed to the divide between scientific and Christian worldviews because the theory not only explained the origins of life in a way that removed Christian beliefs from the picture, but also used methods that challenged the existing ways of studying the natural world.

Poster # 224

The Public’s Opinion on Nuclear Fission

Bond, Brianna Glyn

A Classroom Project for English 298

As we advance our knowledge of the world, so do we our scientific understandings. Within the past 100 years we have discovered and harnessed the power of nuclear energy, for both good and harmful means. Since then, nuclear power plants have begun popping up all over the world, advancing our electric industries along with many others. Whilst beneficial in many ways, if a mistake is made involving nuclear power, the results will be catastrophic. This has been seen several times, specifically with Chernobyl and the Fukushima Daiichi reactor meltdown. In this study, the general populace’s feelings on nuclear energy’s safety is determined by the researcher. The researcher also considers if the disaster at Fukushima, a more recent catastrophe, had any impact on their understanding and beliefs about nuclear energy. The researcher does this first through preliminary research of secondary sources, following with an online survey of a broad group of people. The goal of this research is to see if people have a clear grasp on the truths about nuclear power, and whether their beliefs are based on factual information, or over-exaggerated, muddy claims about this form of energy. If people interpret what they see on the internet as truth, even if it isn’t, we could end up either losing a very beneficial form of energy, or keeping a very dangerous one. The researcher finds that the majority of participants believe nuclear power to be a safe form of energy. These thoughts are largely based off of factual evidence derived from pre-obtained knowledge and new knowledge gathered from the disaster at Fukushima. The results also exhibit that those who believe nuclear energy to be safe, wish for nuclear plants to not be shut down.
Poster # 225

Sports Leadership Without Women
Boone, Kassidy Mariah

A Classroom Project for English 298

Faculty Mentor: Dean, Lance M

Gender discrimination, while becoming less prominent as people stand against the issue, is an extended problem dealt with in the country on a daily basis. Women are often viewed as less qualified when it comes to job opportunities in the sports field. There are vastly fewer women employed to executive positions in the sports field versus the number of men employed in these same positions. This research focuses on the causes of this difference and the potential options for overcoming this disparity. Methods for this research include interviews with college professors who have conducted research in the field and additional information from secondary sources. This writing identifies mentoring as a strategy to combat the lack of women in these fields.

Poster # 226

The Effects of Socialization Practices on Korean Adoptees in the United States
Borsari, Rowan K

A Classroom Project for English 298

Faculty Mentor: McCue, Kristina

Transracial adoptees face a major issue in finding a place where they feel like they fit in. They are simultaneously split into their racial identity and their cultural identity and in most cases there is a sense of disconnect. This paper explores many different studies on socializing transnational adoptees and attempts to minimize the effect that being of a different race, Korean specifically, then the adoptive parents, generally white, has on one’s relationship with their racial and cultural identity. The methods were mostly split into two, it is believed that either children should be encouraged to meet other Korean adoptees and learn about Korean culture, or they should be approached with the idea that race does not affect the child, the “color-blind” approach. Seemingly the most effective approach was the one that taught children about their genetic heritage and gave them a community to relate to. When this was implemented most adults reported satisfaction with their racial identity and clear understanding of where they fit culturally.

Poster # 227

Waste Not, Want Not: Explaining and Reducing Excessive Food Waste in University Dining Halls
Bowman, Hannah Marie

A Classroom Project for English 298

Faculty Mentor: Gentry, Elizabeth Leigh

Transracial adoptees face a major issue in finding a place where they feel like they fit in. They are simultaneously split into their racial identity and their cultural identity and in most cases there is a sense of disconnect. This paper explores many different studies on socializing transnational adoptees and attempts to minimize the effect that being of a different race, Korean specifically, then the adoptive parents, generally white, has on one’s relationship with their racial and cultural identity. The methods were mostly split into two, it is believed that either children should be encouraged to meet other Korean adoptees and learn about Korean culture, or they should be approached with the idea that race does not affect the child, the “color-blind” approach. Seemingly the most effective approach was the one that taught children about their
genetic heritage and gave them a community to relate to. When this was implemented most adults reported satisfaction with their racial identity and clear understanding of where they fit culturally.

Poster # 228

The Necessity to Redefine Medicine

Bowman, William C

A Classroom Project for English 298

Faculty Mentor: Newburn, Harry Fredrick

The research in this paper exemplifies the handicap that regulations place on possibly useful drugs which are restricted from being used medically. To do this, several published articles were analyzed and two interviews were conducted: one with a leading researcher in psychedelic-assisted therapy and the other with a student who suffers with anxiety and depression. The subclass of psychedelic drugs known as serotonergic hallucinogens are the drugs of main focus. Serotonergic hallucinogens are psychedelic drugs that operate on the same portion of the brain as common anxiolytic (anxiety) drugs, and research shows that these drugs serve as potentially beneficial medications for many mental disorders. Dr. Belser, a leading researcher on psychedelic-assisted therapy at Yale, concludes from his work that common hallucinogens may be more beneficial than current anxiolytic and antidepressant medications in treating mental illnesses. In the United States alone, it is estimated that one in every five adults suffer from mental illness in a given year, according to the National Alliance of Mental Illness. The prevalence of mental illness in the United States allows one to infer intuitively that the most effective medications possible to treat these illnesses will be on the market, but because of the American drug policy, these serotonergic drugs are not accepted for their medical benefits. The way the policy is outlined, schedule one drugs, such as hallucinogens and marijuana, are restricted from medical use, while schedule two drugs, including the high potency methamphetamine and fentanyl, are permitted for use. In order for medicine to continue to persist in a progressive manner the American drug policy must be redefined so that patients can receive the most effective medications available.

Poster # 229

Public Health Education: An Analysis on Its Effects on Health Promotion and Disease Prevention

Brawner, Anna Katherine

A Classroom Project for English 298

Faculty Mentor: Nicks, Robin Jean Gray

Public health goes far beyond the four walls of a doctor’s office. It reaches into every aspect of our lives, from traffic safety laws to other community health efforts such as vaccination clinics. However, much of the research on public health education does not extend past what public health is and how it can be applied to education or how education affects health. This study will examine interview responses from three public health professionals at the University of Tennessee-Knoxville about why they believe public health education should be incorporated into all levels of the community to improve health and lifestyle and on their experiences with this topic as public health professionals. With seven billion people in the world, thousands of different lifestyles and beliefs can influence health literacy and knowledge, resulting in gaps in public health education. The information gathered will be used to identify these gaps and explain the benefits of this education with the goal of implementing it into public policy.
Poster # 230

Education: How to Bridge the Gap Between Teacher and Student

Breu, Elizabeth Joy

A Classroom Project for English 298

Faculty Mentor: Gentry, Elizabeth Leigh

In both the public and private sectors of education today, there is a gulf between teachers and students, creating unsuccessful or indifferent students. The purpose of this essay is to come to a conclusion about whether critical or constructive teaching is more effective. It has been suggested countless times that the teacher has direct influence on the skill acquisition of their students, but it has long been debated whether a negative focus or positive focus is more effective. I searched through multiple databases and academic journals to find studies surrounding my topic. This essay is drawing from ten studies regarding teacher method and the success of their students due to their methods. The studies all use measures of student academic success and student perception of the classroom to determine how well or poorly the teacher’s style is working for their students. Research has shown a trend that teachers should use constructive teaching traits such as displaying enthusiasm, leadership, and kindness in their teaching in order to most effectively educate their students.

Poster # 231

The Roman Family of Antiquity: Determining that Affection was Present Among Familial Institutions

Bronson, Alice Rachel

A Classroom Project for English 298

Faculty Mentor: Gentry, Elizabeth Leigh

Is it possible for a biological family to lack any level of adoration towards their partner or children? The initial interpretation of scholars regarding family units in Roman antiquity, was that these unions were established solely to benefit the two families both financially and socially, lacking any emotional bonds. However, through further analyzation of various sources such as funerary inscriptions, legal cases, religious trends, and historical anecdotes, a more accurate depiction of these familial institutions has developed. This research contends that despite the work of some academics, the families in ancient Rome certainly contained genuine affection and love. This claim is further supported by evidence that establishes the actual implication of the father’s power over his children, the required consent of the bride, long expressions of love for the spouse, and acknowledging principal themes of the Roman civilization that promoted this affection between relatives. Understanding the true relationships and interactions of the Romans is crucial because, this ancient empire has had massive impacts on the further development of the world, particularly the United States. The family unit is essentially the root of a society, and by obtaining an accurate portrayal of the empire from which much of our origins derived, a better understanding of our own culture will be a consequence.

Poster # 232

Environmental Impact on Personality: Detecting Destructive Personalities in Child Development

Bruns, Jessica Paige

A Classroom Project for English 298

Faculty Mentor: McCue, Kristina

The majority of psychological difficulties encountered by some people in adulthood are directly attributed to childhood trauma. Being able to detect situations in which children are experiencing trauma could be key in eliminating many later psychological struggles. This current study investigated the research on the extent of influence that the environment has
on personalities and behaviors of humans. Researching this further could be useful in predicting personalities that correlate to childhood maltreatment corresponding to uninheritable diseases or conditions could be useful in changing situations in order to diminish emotional and mental disorders in adulthood. While it is true that some psychological problems are directly inherited from parents, many can be attributed to some kind of childhood trauma. Research was conducted through separate studies on a stress causing gene in patients with Borderline Personality Disorder, on polygenic scores, and subsequently on salivary telomere length in correlation with the social environment to examine the biological testers of personality as they relate to home environments. Catching detrimental home environments as soon as possible is key in making sure that destructive elements have the least possible effect on the mental health of children as well as alleviating overcrowded mental care facilities and violence associated with psychological problems.

Poster # 233


Buckley, Jesse

A Classroom Project for English 298

In 1967, the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, better known as The Outer Space Treaty, was opened for signature to the primary spacefaring nations and later entered into force, providing a legal framework for international space law. One of its primary goals was to prevent the militarization and weaponization of space. While there is a general consensus that technological development has rendered the treaty obsolete, there is significant debate surrounding the idea of a solution to this problem. However, this project is not intended to propose such a solution, but to examine the flaws present in the Outer Space Treaty with respect to its objective of preventing militarization, such as overambition and neglecting to ban conventional weapons. This will be done by analyzing the original treaty and its follow ups, in addition to contemporary works on the topic of space law. The purpose of this project is, by exposing these shortcomings, to prevent their incorporation into any revision, amendment, or new treaty in the hope of future-proofing any such solution.

Poster # 234

Artificial Intelligence and Implementation

Burnside, Michael William

This piece will enter readers into a discussion about the history, research, and industrial implementation potential for the field of Artificial Intelligence. It is primarily concerned with the recent advancements in neuromorphic research like some of the developments between the University of Tennessee and Oak Ridge National Laboratory. These two entities collaborated to create a robot that can traverse an area and learn more efficient ways to do so as time progresses. Through the integration of supercomputers, creativity, and hard-work, students Parker Mitchell and Grant Bruer were able to achieve this tremendous feat. Firsthand accounts from members of the project and other robotics professionals layout how Artificial Intelligence will be able to transform the world.

New approaches such as neuromorphic research will be able to revolutionize the way people can run industry and manufacturing. Though primitive at this point, adequately implemented Artificial Intelligence devices will acquire the ability to adapt to the work-environment as time progresses. Productivity and power efficiency will both skyrocket while leaving people's jobs intact. For any reader who is interested in improving the way he or she uses technology in the
business world, neuromorphic research is the perfect solution to enhance cost-effectiveness while continuing to employ the same amount of real people.

Poster # 235

The Last One Percent: Prison Healthcare and American Community

Bustamante, Carolina Golden

A Classroom Project for English 298

The prison system is the United States is crippled by a lack of adequate healthcare for inmates. Poor conditions and overburdened professionals exacerbate pre-existing diseases and fail to address mental health. In addition, prison can be a place where disease spreads to new hosts and eventually their home communities. This necessitates an overhaul of the way the United States treats healthcare for inmates, who often come from the unhealthiest populations in the country. Incorporating the health of inmates in to our thinking about the country’s health as a whole would lead to a more effective system and maximize opportunities to treat individuals who might otherwise not have access to healthcare. This requires widespread reform from prison conditions, healthcare professionals, and public health policy makers. These reforms will not be without costs, but the benefits have to potential to impact the cycles of poverty, imprisonment, and poor health for one of the most vulnerable populations in the United States.

Poster # 236

Looking to the Future: Technology’s Impact on Jobs

Cable, Miranda Grace

A Classroom Project for English 298

Looking to the Future: Technology’s Impact on Jobs

Modern technology has introduced benefits of instant access to an endless supply of information as the field of technology is growing rapidly. Although the popular belief is that jobs are being lost to overseas production, most of the jobs are just becoming obsolete, and America as a whole should pay attention to how the work force is evolving, especially young individuals who are deciding their career paths as a decrease in the job market will heavily impact the country and the well-being of its citizens. As a result of this impact, there are possible mental and physical health risks at stake. Furthermore, investigating how the people in charge of these technologically forward-moving companies are adapting, as well as how the economy will have to shift in order to keep up will provide a better understanding of what people are to expect in the future. Despite opposition, technological advances do provide incentive for a more educated workforce. Many argue that technology has changed and will continue to change the definition of a good employee and change the way businesses have to compete. Proposed solutions to the problem of job loss due to technology largely include entrepreneurship, which will allow people to be the ones creating the new technology. However, this will be overshadowed by widespread job insecurity in the future.
Poster # 237

**Playing the System: How Gaming Can Foster Valuable Skills for Engineers**

Cannon, Christopher Joseph

A Classroom Project for English 298 Faculty Mentor: Gentry, Elizabeth Leigh

While gaming has normally been regarded as a simple pastime for students, with some implications that it exerts negative influences on student behavior, recent research seems to suggest that gaming can prove a valuable tool in the development of a student’s required skillset. These skills, observed in Barr (2017), are of vital importance in the engineering field, as noted by other experts. This paper reviews both this research and other sources that detail what these skills are, why they are important in the engineering field according to employers in this field, how gaming can develop them, and why gaming should be considered as an additional tool for educators to use. Despite this, gaming has been known to cause other negative effects amongst gamers, and these cannot be ignored when an educator considers the implementation of gaming in a classroom setting. With this in mind, this paper still argues for the implementation of gaming in the engineering education field, as the skills observed in this study and others are valuable skills in the engineering field that are of great demand to employers and such a change in the education aspect could prove to be rather effective in the furthering this field.

Poster # 238

**Comparing the Effects of Sleep and Breakfast on Academic Performance**

Canupp, Hayes Andrew

A Classroom Project for English 298 Faculty Mentor: Newburn, Harry Fredrick

Eating breakfast and getting an adequate amount of sleep are two key components to academic success. However, due to busy college schedules, students are often unable to receive enough sleep. As a result, many students will skip breakfast in favor of more sleep, regardless of the negative impacts of doing so. This project answers the question of which activity is more influential on academic success in college students. I conducted secondary research along with primary research interviews to find an answer to this question. I conducted interviews with a nutritionist from the University of Tennessee, the medical director of the sleep disorders clinic at the University of Tennessee, and a regular student to gain information on the topic. I also designed and conducted a survey to acquire data to support my hypothesis. After conducting this research and analyzing data collected by the survey, I concluded that students who allotted time for breakfast in the morning were more likely to be academically successful than students who consistently failed to eat breakfast in the morning.

Poster # 239

**Impact of Nutrition and Diet on Performance of Endurance Athletes**

Carlton, Emily

A Classroom Project for English 298 Faculty Mentor: Barrow, Robin

This is a classroom project for English 298. Whether on television, Pinterest, Facebook, billboards, or by word of mouth, there are numbers of diets that promise weight loss, greater energy levels, better sleep, and enhanced athletic performance among many other things. However, many of these diets contradict each other in their nutritional protocols,
ranging from low-carb to low-fat to veganism and everywhere in between. Which of these diets is truly ideal and the best for the performance of endurance athletes? As an endurance athlete, knowing the answer to this question is crucial if one wants to be successful. This project explores which of these diets is truly the best for enhancing the performance of endurance athletes and why. After conducting secondary research and interviewing experts, I was able to conclude from my findings that a diet high in carbohydrates is best for optimizing performance. This project explains how carbohydrates improve performance and also what nutrients and strategies they should be paired with.

Poster # 240
Exigence and Justifications of Altruistic Lies in Medicine: A Qualitative Study
Carter, Zoe Anne
A Classroom Project for English 298
Faculty Mentor: Brouwers, Marcel

Widely recognized as a war-time tactic, strategic deception demonstrates both the horror and often unsuspected betterment stemming from the promotion of untruths. Traditionally, scholars reference German anti-Semitic propaganda of World War II as the primary exemplification of war-induced deception; however, the robust occurrence of altruistic lies suggests the need for further investigation into the nuances of deception during war. Grounded in a case of altruistic medical deceit during the Holocaust, this study examines the exigence of altruistic lies and how society justifies or rejects such cases. In order to study society’s possible rationalization of compassionate lies, an online questionnaire clarified public perception of deceit, especially in medicine. Results indicate that while the general sampling agrees to the existence of justified lies, most participants reject a need for such justified falsification in contemporary medicine. Further, the questionnaire suggested an underlying trend of outcome rather than motivation-based justification of altruistic lies. These findings exhibit an interesting clash between the portrayal of historical altruistic deceit and the current societal – perhaps moral – permissibility of medical deception. With an emphasis on archived medical deceit during World War II, this study seeks to uncover why populations rationalize lies in times of historical hardship yet lack similar justifications for contemporaneous issues.

Poster # 241
Government Transparency in a Modern Age
Caughman, Elizabeth Grace
A Classroom Project for English 298
Faculty Mentor: Addicott, Randi Marie

With technology so readily available, government transparency is becoming a demand from citizens. This demand is fueled by a lack of trust in the government. The demand is good for the government and its citizens. Government transparency is defined as being open, accountable and honest. There are two types of transparency: opaque and clear, as well as two types of accountability: soft and hard. With the government adapting its transparency to technology, it can under serve groups in lower economic statuses, where access to technology is not financially feasible; this is combatted by public computers in public libraries as well as low cost internet. With the government sharing all of its information, the citizens can find inefficiencies, and solve them, thus bettering their own government.
Poster # 242

Potential Correlations Between Mass Shootings and the Media: A Qualitative Study

Chu, Phillip

A Classroom Project for English 298 Faculty Mentor: Brouwers, Marcel

Social media and the internet in recent years have allowed for the rapid spread of information and news across the globe. Unfortunately many false articles and ideas are blended in and circulated with other actual news reports and facts. Social media’s quick distribution of this information, without any buffer between the authors of content and the public audience, can influence the minds of a large group of people very quickly. In addition, statistics have shown that mass shootings have increased in frequency in the past decade, and the likes of social media and other news outlets have been proposed by some to have promoted their infamy with each occurrence. This study aims to analyze potentially false public opinions concerning mass shootings in general and their relationship to the media through an online survey distributed to participants of varying genders, ages, races, nationalities, and political affiliations.

Poster # 243

Nature’s Benefits: Personal, Societal, and Economic Impacts of Restoration

Cianciolo, Paul James

A Classroom Project for English 298 Faculty Mentor: Newburn, Harry Fredrick

Anthropogenic degradation of natural urban habitats - as a result of pollution, industrial waste, impervious structures, etc. - is the cause of some of the most devastating environmental tragedies of this era. Unfortunately, the negative effects of urbanization on natural ecosystems do not exclude human societies, leading to declined mental health, societal activity, and economic growth. The negative effects of urbanization and, oppositely, the positive effects of urban natural spaces on societal well-being are indirect, but not insignificant. Urban natural spaces, particularly those intended for human enjoyment, boost personal psychological health, increase social activity and community involvement, generate local spending, and provide large-scale ecological services which can be accurately translated into economic worth. Unfortunately, severely impaired habitats provide few and insignificant ecological services, which is why I argue that restoration is key to maximizing economic and societal benefits that natural spaces bring to a city.

Poster # 244

Perception of Toxic Masculinity Amongst College-Aged Men

Clark, Allison D

A Classroom Project for English 298 Faculty Mentor: Nicks, Robin Jean Gray

Toxic masculinity is a term whose use has increased exponentially as of late. As defined by Terry A. Kupers (2005) of the Wright Institute, toxic masculinity is behavior exhibited by men that has harmful effects on themselves and others. A more common and widely understood interpretation can be found in the research conducted by Keith E. Edwards and Susan R. Jones (2009) which describes it as a false persona of hyper masculinity that men feel pressured to present to the world. However, this study departs from prior research and, instead of attempting to prove or disprove the existence of toxic masculinity, works to understand how the use of the term “toxic masculinity” and the perceptions of the feminist movement affects the interactions of college-aged men with women and other men in their lives, especially in regard to
feminism. To accomplish this, three interviews were conducted with male members of the Chancellor’s Honors Program, through which, it was found that there is a disparity in the level of understanding between feminists and those who consider themselves apart from this movement. These results can then be used to repair the relationships and build a common understanding between them.

Poster # 245

Are serial killers born or made: An analysis of what college freshmen think about nature versus nurture

Colletti, Caleb William

A Classroom Project for English 298

Faculty Mentor: Nicks, Robin Jean Gray

There have been numerous studies done over the years about nature and nurture and how it connects to serial killers. Different researchers have interviewed and studied adults to see whether they think they were affected mainly by nature or nurture, and various similar studies have been conducted on serial killers. Caleb Colletti didn’t find any reviews done on young adults to see what they think affected them the most, and similarly, whether they believe that serial killers were influenced more by nature or nurture. This study is vital because college-aged students are next in line to become citizens in the workforce and we need to know what they think of these matters. Caleb Colletti interviewed three first-year college students attending the University of Tennessee Knoxville to see what they thought about the issue. The results could lead to a more extensive understanding of what the public thinks of serial killers, but more research would have to be done. This study will use qualitative research methods to investigate how first-year students in the Chancellor’s Honors Program at the University of Tennessee view serial killers and whether they think that serial killers are a product of nature or nurture.

Poster # 246

Archaeological Looting: A Socioeconomic Solution for a Past World Problem

Corbin, Nicholas Tanner

A Classroom Project for English 298

Faculty Mentor: Gentry, Elizabeth Leigh

Most previous archaeological solutions to looting primarily focused on discovering these sites as quickly as possible. Current methods, like satellite detection, provide accurate and quick detection of looted sites. However, current solutions are not cost effective or preemptive, which means that looting cannot be directly stopped with these methods. Recent increases in economic disorder and increases in drug usage have shown that these trends correlate to an increase in archaeological looting, as many people loot for drug money or to make a living. This trend is especially apparent in 3rd world countries, where many archaeological sites preside. However, first world countries are not out of the picture, socioeconomic inequality and drug use are still present in these countries and looting of sites in those countries is present. A preemptive solution that can prevent most looting from ever happening is necessary. Increasing socioeconomic equality in affected countries is ideal to prevent sites from being looted at all, because it removes the economic and drug based reasons to do so. This approach is more cost beneficial and provides a greater benefit to society than other current solutions, as it attempts to solve the underlying issues of looting.
Poster # 247

The Politics of Engineers

Coulter, Brian Grayson

A Classroom Project for English 298

This paper is a classroom project written in the pursuit of determining whether or not the average engineer is more likely to identify with a certain political ideology. I chose to pursue this topic because it does not as of yet have a definitive conclusion. Additionally, if a correlation does exist, this acts as a gateway to further, more intriguing projects directed at rooting out which factors incline engineers to lean a certain way politically. I examined this topic by analyzing the existing data on this topic in addition to collecting information about the common demographic of engineers and drawing conclusions based on the political data that is usually reflected in these demographics. Beyond secondary sources, I also conducted interviews with four working engineers, inquiring about the political climate they experience at work and what they think inspires such a climate. My inquiries indicate that most engineers are roughly in the center of the political spectrum with perhaps a very slight rightward bias; however, all sources report the field to be largely devoid of political discussion in the sake of professionalism.

Poster # 248

The Effects of Continued Education on Marriage Age

Cousins, Elizabeth Andrea

A Classroom Project for English 298

In recent decades, the age of marriage has steadily increased. This increase in age follows the spike in marriage during the time of the baby boomers- post World War II. Furstenberg (2010) argues that men and women pursue an education past the high school level in order to attain a job appropriate for establishing economic security (p 4, 5). Other research also suggests a correlation between economic stability and age of marriage, but none has received concrete thoughts from individuals who have faced marriage and post undergraduate education or plan to. The project seeks to discover the effects of continued education on marrying age. Research methods included: having two mother-daughter pairs answer questions about marriage, education, and other socioeconomic factors that could influence a person’s decision to get married. The completed research provides useful information on changing social conditions and the way in which beliefs are carried across generations.

Poster # 249

Reducing Recidivism in America: Implementing More Effective Education for Juvenile Offenders

Cowell, Sophia Dessie Rose

A Classroom Project for English 298

Ever since the days of the founding fathers, America has always relied on a set of laws to govern its people. Starting with the Constitution and Bill of Rights, the United States has implemented many strict rules to keep order in place. However, despite the common belief that having many laws reduces the amount of crime, America is still the only country in which more than 700,000 juveniles are jailed in detention centers, and that number is even higher for adults. A major reason that so many adult offenders are jailed is that in the American judicial system, there is a trend that child offenders continue
to commit crime for the rest of their lives. If more effective education is implemented for juvenile offenders, America can reduce recidivism and will be able to bring down its crime rate as a whole. By improving our education for child offenders in our juvenile judicial system, the American justice system will not only be able to reduce the amount of juvenile crime, but it will also lessen the amount of crimes committed by adults in this country.

**Poster # 250**

**The Dangers of Social Media: How It Influences Opioid Abuse in College Students**

Crocker, Caroline Caitlyn

A Classroom Project for English 298

Faculty Mentor: Murphy, Samantha Ann

Rapid globalization has caused a sharp rise in social media use, especially in teenagers. This increased presence of social media has encouraged users to share personal information that they typically would not post. Sharing this information influences users by skewing their perceptions and induces peer pressure. This project seeks to understand how these factors, among others, affect college student’s willingness to try and abuse opiates. Beginning around 1990, non-medical use of opiates in the United States has skyrocketed, driving the country into an opioid epidemic. With the universality of social media, users are more likely to be exposed to these prescription drugs through either peers or advertisements funded by pharmaceutical companies. This project analyzes the advertisement of prescription drugs on social media platforms by pharmaceutical companies and how this effects consumer’s willingness to request prescriptions to purchase the product. Finally, it discusses the online black market for prescription drugs and how social media is used as a promotional domain for these black markets. The goal of this project is to expose social media use as a risk factor for opiate abuse.

**Poster # 251**

**Understanding the Moral Effects of Business Students on the Simultaneous Study of Business Ethics and Profit Maximization**

Crowe, Sydni Noel

A Classroom Project for English 298

Faculty Mentor: Brouwers, Marcel

Over the past two decades, college professors have put an emphasis on the teaching of business ethics, specifically due to the accounting scandals associated with Enron Corporation, Tyco International Ltd., Adelphic Communications Corp., and Worldcom Inc. These corporations have demonstrated that the rise to wealth and power can be partly attributed to misconduct and unethical behavior in leadership, displayed through the falsification of business records and grand larceny by individuals in top level management positions. The researcher questions if business students are becoming morally conflicted by the recent emphasis on business ethics and simultaneous stress on profit maximization by professors. As an initial step in determining whether these assumptions are accurate, the author conducts a survey of business students from around the world through the online networking service, Reddit, to explore existing student beliefs on the importance of profit maximization vs. ethical behavior in the business realm and to uncover students’ feelings towards these conflicting subjects. For a second perspective, a former accounting graduate from the University of Tennessee gives her opinion through an interview on the conflict after working in the public accounting field and now owning her own business. The results conclude that students are not fully prepared to make moral decisions in the professional atmosphere based on the current approach to teaching business ethics and profit maximization.
**Poster # 252**

**The Power of Music In Benefitting the Neural Health of Humankind**

Da Ponte, Olivia Bennett

A Classroom Project for English 298

Music is a powerful element that has tremendous effects on the human brain. Knowledge gained in studying these effects can be applied to health care settings, benefitting overall neural health. This paper examines the several areas in which music can be a helpful source to the brain by looking at both the ways it is used and the many effects it has through each method of implementation. Child brain development, anxiety and pain, relaxation, and memory recovery are researched through a combination of the information provided by studies, reviews, and a series of personal interviews with experts. All of these neural phenomena can be affected by music, whether that be learning to play an instrument, listening to music, or actively participating in music by repeating sounds and rhythms. These therapeutic services have mitigated the symptoms of various diseases and disorders, including but not limited to Alzheimer’s disease, anxiety disorder, and strokes. This paper concludes that music should be given greater consideration in health care applications to benefit a wide range of problems at various stages of life.

**Poster # 253**

**Psychology, Society, and the System: Barriers to Mental Health Care Access**

Dallas, Jamie Nicole

A Classroom Project for English 298

Despite having better medical knowledge and more advanced technology than ever before, in 2017, only 24.1% of the 44.7 million adults diagnosed with a mental illness in the United States received mental health care (Substance Abuse and Mental Health Services Administration 2017). With a significant portion of the population suffering from mental illness, it is important that we understand why our extensive medical expertise and abundant resources are not being used to their fullest potential. This class project for English 298 examines the primary factors that influence an individual’s ability and decision to seek mental health care. Based on information gleaned from a literature review and supplemental interviews of experienced mental health professionals, it appears that several structural, psychological, and societal barriers influence whether an individual will receive mental health care, including limited accessibility, lack of perceived-need, and social stigma. In gaining a better understanding of the barriers to mental health care access, we can improve availability of mental health care services, encourage individuals to seek treatment, and ultimately improve the lives of millions of people suffering from mental illnesses.

**Poster # 254**

**Is Engineering a Stable Career?**

Davenport, Tristan Addison

A Classroom Project for English 298

This is a classroom project for English 298. Engineering is marketed as a highly sought-after career that will never run out of jobs. Because I am planning to go into this field, I wanted to see how valid this assumption is. When I looked online to see what people said about engineering in today’s market, the answer I found ended up being not so black and white. In
order to find out more about the cause for the difference in perspective and to find out how stable the engineering job market really is, I interviewed a graduate student here at the University of Tennessee and an engineer who has been on the job market for several years. Hopefully, this inquiry will lead to a more accurate representation of engineering today.

Poster # 255

Is Architecture Not Talking About It’s Sexual Harassment Problem?

Davidson, Alexa Anne

A Classroom Project for English 298

We are told the world has entered a new era and sexual harassment is no longer a tolerated standard in nearly every industry. So, is this true? One field seems to be relatively silent: architecture. Architecture has long been a man’s world, and while industry saw its gender shift in the late 20th century, it seems that there may be issues still with sexual harassment. This paper investigates whether architecture has an issue with sexual harassment by interviewing experts, examining secondary source literature, and using testimonials from architects in the region. It also investigates why, if there is a problem, is no one speaking about it? This paper finds there is little problem in the field itself. Working in the field you have a low chance of experiencing sexual harassment. But in schooling for architecture, it’s very much an issue. Due to this, no one talks about it, because sexual harassment in architecture school has the devastating affect of driving people from the field.

Poster # 256

“How to Make A Baby”: Ethical Opinions on Genetically Modified Embryos from Undergraduate Pre-Medical Students

Davidson, Alexandra L

A Classroom Project for English 298

In universities around the country, there are young and hopeful pre-medical undergraduates that will one day spearhead revolutions in medical technologies, specifically in the upcoming science of genetically modifying embryos. Medical journals, like the Indian Journal of Pediatrics, the BMJ Journal of Medical Ethics and the Journal of Obstetrics, Gynecology & Reproductive Medicine, talk of the possibilities of genetically modifying embryos, but confirm that no advancements in this technology have been made. Most likely, young students will yield the progress in this area of medical research. However, medical journals about genetically modified embryos are devoid of opinions from this budding generation. This study interviewed three pre-medical students at the University of Tennessee about how they feel about future of genetically modified embryos, the creation of donor babies and the laws that should be put in place around these medical advancements. These students gave answers that are optimistic about genetically modifying embryos to cure disease but that question the morality of the proposed medical technology when used for societal desires. There has always been an ethical issue about genetically modified embryos, however the opinions of the new generation could create more problems than already in question.

Poster # 257

A Historical Analysis of Financial Practices and Their Relationship to Individual Prosperity

Davis, Joshua Scott
The finance world is a major part of our history, and the financial past can shed great light on the action we as a society should take in the future regarding the finance world. That being said, history also provides evidence of finance and social welfare having a direct, reactive correlation. This direct correlation proves that social well-being is in fact dependent somewhat on financial success. This theory is applicable to the individual as well, and many times we see that individuals who pride themselves in being fiscally responsible have a greater welfare as well. However, it is important to note that this is somewhat of a rarity nowadays, as many people are not fiscally responsible. The modern-day view of finance should go from “who is this benefiting?” to “how can it benefit me?” This apparent mirage that the modern world has of finances prevents individuals from truly evaluating how this theory can greatly benefit their lives. Moreover, this argued truth shows how two different areas of life can directly impact each other greatly. Without an individualistic approach to this truth, the evidence of societal benefit from financial practices, habits, and decisions will not be as profound as they can be. Also, the vast innovations in the field of technology have seemed to propel the financial world into great times of transformation. That being said, it is greatly important now more than ever that individuals try and view the financial world from a perspective they may have not possessed before.

**Poster # 258**

**The Effects of Physical Deterioration in Zero Gravity on the Advancement of Space Travel**

Delk, Nathan Morris

A Classroom Project for English 298 Faculty Mentor: Barrow, Robin

This is a classroom project for English 298. After Scott Kelly’s year spent in space in 2017, it became apparent to NASA and the world that the longer humans are in space and without gravity, the worse their bodies deteriorate. Joints, tendons, bones, muscles, and sensory organs take a strong enough impact to disable the astronauts on their return for months. This is highly critical to any future space plans, as just Mars would take at least seven months to get to. The majority of these problems have been sourced to the lack of gravity on the human body. There have been hundreds of designed and/or attempted solutions based on creating an effect or simulation of gravity, which have been impractical based on size or impossible to implement due to our current technological abilities. In order to venture to Mars or anywhere further, a method to reduce or remove the negative effects from the lack of gravity needs to be put into effect. This paper is my classroom project about the physical effects of zero gravity, the many solutions possible to fight them, and the benefits of exploring space.

**Poster # 259**

**Alcoholism and Acculturation: an Examination of Environmental Influence on Addiction**

Depersio, Richard John

A Classroom Project for English 298 Faculty Mentor: McCue, Kristina

Addiction tendencies among immigrants have provided a case study for modern psychological and sociological researchers to analyze theories regarding the origin of addiction. Specifically, during the acculturation process of Latin-Americans, a trend towards increased substance-abuse is identifiable as generations become more detached from their original source cultures (Kam et al, 2010). Through the current research this phenomenon has revealed social influences and peer groups as more powerful predictors of abuse than physiological composition; in other words, the environment in which one resides is more important than genetic composition, a finding consistent with studies of non-immigrants as well. Indicators
of alcoholism presented in the previous studies, such as attending college (Hartford et al, 2006) and family involvement (Nair et al, 2018), are also indicators of future socioeconomic success. Therefore, in general, those who maintain a path towards socioeconomic prosperity are less likely to suffer from instances of substance-abuse than those who, for example, do not receive post-secondary education. In a world that is undergoing increased globalization on a daily basis, understanding the toll culture shock takes on the human psyche permits researchers to identify links between environment and behavior. Furthermore, future research should prioritize the investigation of correlations between social involvement and proceeding substance-abuse events.

Poster # 260
Public Perceptions and Misconceptions of Nuclear Power
Dharsandia, Jay Ashok
A Classroom Project for English 298 Faculty Mentor: Barrow, Robin

This is a classroom project for English 298. With the technology that we have today, nuclear power presents a clean and safe alternative to the fossil fuels that are used to generate the clear majority of the world’s power, with demonstrable lower deaths per unit of energy produced and environmental damage caused. Despite this, however, the nuclear power industry has not grown significantly in the last one and a half decades, and the public’s opinion toward it seems to be unchanged. The investigation conducted as a part of this project aims to determine why the public opinion of nuclear power remains the way that it is, and why certain misconceptions are held by the public. This research is significant because it can provide new information about the public’s views on the nuclear power industry, which would be useful in improving the nuclear power industry’s public image and further allowing the industry to grow.

Poster # 261
To B or not to B: The Greek Dilemma
Diaz, Amber Y
A Classroom Project for English 298 Faculty Mentor: Nicks, Robin Jean Gray

There is often a negative stigma associated with being a member of Greek life. This study will discuss whether or not the negative correlation between involvement in Greek life is due to Greek involvement or the types of students who are drawn to Greek life. There have been studies which discuss the negative correlation between involvement in Greek life and GPA; however, there is little discussing the types of students involved in Greek life. Interviews with freshmen and sophomore members of fraternities and sororities were used to determine the academic drive and motivations of these students. Results were analyzed and compared in order to determine if involvement in Greek life correlates with academic drives and motivations.

Poster # 262
Using Tasmanian History to Disprove the Martian Utopia
Dixon, Jonathan Alexander
A Classroom Project for English 298 Faculty Mentor: McCue, Kristina
Scholars seldom apply their studies of the past to the future or ground their speculations about the future in past events, which can lead to incomplete conclusions about human sociopolitical development. Elon Musk, for instance, has famously claimed that his company, SpaceX, can establish a Martian colony by the mid-2020s, but this perspective does not account for the social challenges that have historically developed in island societies. This paper challenges this sort of idealistic speculation about Martian colonial development by connecting Tasmanian history, modern scientific observation, and political theory to a potential Martian environment. Since Mars is geographically isolated from Earth in the same way that colonial Tasmania was isolated from its founding country, it will exhibit the same trends of island development, in accordance with the theories of islandness and social capital (Stratford 2008; Baldacchino 2005). The research described the political, economic, and emotional components of Tasmania’s development, such as its system of government, the way it built its infrastructure, the sectors on which its economy grew to depend, and the distinction between settlers’ expectations and the reality of living on an island. By extending these theories and trends from Tasmania to Mars, this paper concludes that a Martian colony will not be the utopia many have suggested it will become, which indicates that studies in political science provide the most useful and accurate understanding of how human society works when they evaluate the future alongside a historical analog.

Poster # 263
Modern Media and Politics: The Impact of "Fake News"
Doran, Evan William

A Classroom Project for English 298
Faculty Mentor: Newburn, Harry Fredrick

“Fake news” has become a term that is used far too often in modern society, especially in the political sphere, and my research sought to explain and detail the detrimental effects this term has had on social media as well as major news organizations over the past couple of years. The research was conducted through the use of databases, mostly consisting of academic articles, and also an interview with the senior editor at the Knoxville News Sentinel that is often affected by “fake news”. An attempt to put a concrete definition on the term was made; however, “fake news” encompasses so much and is so often misattributed that it is hard to give a single concrete definition, therefore multiple definitions were established, given the severity of the various impacts each subset has had on society. The different groupings allowed further investigation into the impacts each subset has had on certain events, such as the 2016 U.S. presidential election, as well as the impact they have on the daily lives of people living in the United States or otherwise. The research concludes that the problem with “fake news” is not its impact on any one event; the problem is that it has provided a way for people to remain comfortable in their own realities and never have to question these realities. They can simply label anything contradictory to what they believe “fake news”. This problem has great implications in the realms of debate on policy and how socio-political issues should be handled because these debates cannot happen if there is no agreement as to what the facts are. “Fake news” has provided people with a cop out; it is a conversation nonstarter.

Poster # 264
Gender Bias in STEM: A Qualitative Study
Drum, Emma Adair

A Classroom Project for English 298
Faculty Mentor: Brouwers, Marcel

Several studies conducted suggest that a gender bias in science, technology, engineering, and math (STEM) fields exists. Through this previous research, men have shown a tendency to believe that gender bias does not exist, in comparison to
women. The author of this study surveyed individuals who are majoring in a discipline of engineering at the University of Tennessee (UTK). Distribution of a survey containing questions about the gender bias in STEM occurred on the GroupMe messaging application. The researcher hypothesizes that, at UTK, men tend to not believe this gender bias exists, while women tend to believe that it exists. Part of the hypothesis proved true, with women tending to believe that the gender bias in STEM exists. The researcher did not receive enough responses from male participants to make a conclusion about what males believe about the existence of a gender bias in STEM, so the hypothesis proved neither true nor false. Women reported experiencing gender bias in STEM more than women, with responses ranging from gender bias experienced in college, in the workplace, and through comments from people inside and outside of STEM. Participants responded as more likely to believe in the gender bias in STEM when shown a study performed by female researchers that reported that this bias exists.

Poster # 265

Examining Low Voter Turnout in the United States

Dudrick, Luke Payne

A Classroom Project for English 298

Faculty Mentor: Barrow, Robin

This is a classroom project for English 298. Political participation is an integral aspect of any democracy, but despite this, America’s voter turnout in elections is consistently lower than that of comparable democracies. America’s voter turnout problem is not merely a recent issue, but it has been apparent throughout the history of US presidential elections. In order to gain more information on this issue, I interviewed a political science professor who has studied voter turnout from a comparative perspective, and I interviewed a member of the Knoxville community who has never voted in an election. The results of these interviews yielded various explanations for low voter turnout, identifying a plethora of institutional issues within our electoral system. America’s lack of automatic voter registration and the lack of representation under the two-party system arose as salient issues contributing to low voter turnout. I hope that my project will compel citizens of all ages to vote more by emphasizing the importance of their role in democracy, and also pique them to critically examine the structure and legitimacy of our political institutions, rather than merely accepting them at face value.

Poster # 266

The Relevance of "Fake News" in America Today

Dukes, Michael Travis

A Classroom Project for English 298

Faculty Mentor: Newburn, Harry Fredrick

Political participation is an integral aspect of any democracy, but despite this, America’s voter turnout in elections is consistently lower than that of comparable democracies. America’s voter turnout problem is not merely a recent issue, but it has been apparent throughout the history of US presidential elections. In order to gain more information on this issue, I interviewed a political science professor who has studied voter turnout from a comparative perspective, and I interviewed a member of the Knoxville community who has never voted in an election. The results of these interviews yielded various explanations for low voter turnout, identifying a plethora of institutional issues within our electoral system. America’s lack of automatic voter registration and the lack of representation under the two-party system arose as salient issues contributing to low voter turnout. I hope that my project will compel citizens of all ages to vote more by emphasizing the importance of their role in democracy, and also pique them to critically examine the structure and legitimacy of our political institutions, rather than merely accepting them at face value.
Poster # 267

Sentiment Analysis in Social Media

Dylewski, Racheal

When it comes to decision making for businesses and organizations, the course of action is largely influenced by the views of the public. Data gathered from public opinion can be used to gauge how society will react about a particular product, person, company, etc.

With the large presence of social media, blogs, forums, etc. on the internet, researchers are presented with access to more opinionated data than ever. A data pool so vast is nearly impossible for humans to shift through to gain insight on public opinion. Sentiment analysis and opinion mining is the field of study that researches people's opinion from written language. Sentiment analysis systems allow for computers to use deep learning algorithms to sort through internet data and decipher whether a written text has positive or negative sentiment towards a particular target in a manner more efficient than the old practices of manual research, conducting surveys, etc. Through secondary source research and expert interviews, this study analyzes the computational processes of sentiment analysis as well as its current and future significance to society in order to demonstrate its potentials to change the way people analyze data.

Poster # 268

Standardized Testing and the Positive Correlation Between Anxiety and the Education System in America

Edwards, Cassidy Noel

In recent years, America has experienced a rise in reported levels of diagnosed anxiety disorders, particularly in younger generations, such as current high schoolers. With this spike in anxiety levels, many high schools have put accommodations in place to benefit their students and attempt to make the learning environment easier for more anxious individuals. However, despite the willingness of these institutions to accommodate students, the American education system is likely to have a role in this trend of increasing anxiety levels. With such great focus on standardized testing and achieving high exam scores, the typical American school is a very stressful environment for many students. Because of increasing pressure on students to succeed and achieve high standardized test scores, these students are becoming more anxious in the face of such intense pressures. Because of the pressures placed on students to do well in school, learning becomes incredibly stressful and many teenagers dread going to school. Thus, this project argues that a decrease in standardized testing and a greater focus on more individualized learning could help to reduce anxiety levels among American students and improve our education system.

Poster # 269

Salutary Neglect: The Effects of 18th Century British Power Systems on the Cause of the American Revolution

Edwards, Luke Aaron

In recent years, America has experienced a rise in reported levels of diagnosed anxiety disorders, particularly in younger generations, such as current high schoolers. With this spike in anxiety levels, many high schools have put accommodations in place to benefit their students and attempt to make the learning environment easier for more anxious individuals. However, despite the willingness of these institutions to accommodate students, the American education system is likely to have a role in this trend of increasing anxiety levels. With such great focus on standardized testing and achieving high exam scores, the typical American school is a very stressful environment for many students. Because of increasing pressure on students to succeed and achieve high standardized test scores, these students are becoming more anxious in the face of such intense pressures. Because of the pressures placed on students to do well in school, learning becomes incredibly stressful and many teenagers dread going to school. Thus, this project argues that a decrease in standardized testing and a greater focus on more individualized learning could help to reduce anxiety levels among American students and improve our education system.
In the American colonies, the early parts of the 18th century were characterized by a feeling of independence and self-governance. The 1760s, however, were a time of great change within the British power system. The role of the Crown, specifically concerning control of the Empire’s colonies, was being reimagined. The era of Salutary Neglect, a policy characterized by a hands-off, apathetic approach to the colonies by the British monarchy, had come to an end. King George III decided to retake control of colonial activities. Within the next twenty years, tensions resulted in the War for American Independence. The rise in colonial anger through the 1760s and in to the 1770s shows that the original domino in a long chain of unfortunate circumstances was the ending of the policy of Salutary Neglect, and therefore, the ending of this policy can be set aside as the primary cause of the American Revolution.

Poster # 270

Bridging the Chasm: Undergraduate Education and Graduate Research in the Biological Sciences.

Elbon, Claire E

A Classroom Project for English 298 Faculty Mentor: Barrow, Robin

This is a classroom project for English 298. Continuous change in research methods in the biological sciences has always been a vital part of the discipline to ensure best practices in scientific experimentation. Often, the rate at which applicable research methods change occurs quickly, requiring researchers to modernize experimental methods. Given the rapidity at which changes can occur, research methods may transform within an undergraduate students’ time at university. Maintaining relevant curricula at an undergraduate level poses many difficulties, while emerging graduate researchers face the potential of beginning their careers using outdated practices rather than being able to apply advanced procedures and contemporary research methods. I will examine the benefits of undergraduate students in scientific research and the benefits of participating in and staying relevant to up-to-date research methods. This will be done through qualitative interviews with graduate students to examine the academic gap between undergraduate education and graduate research methodologies. I hope to demonstrate that participation in research at the undergraduate level will result in: (a) enhanced knowledge of prevailing research methods; and (b) improved readiness for research at the graduate level.

Poster # 271

Why America Should Establish a Legal Organ Market

Ellis, Amanda Faith

A Classroom Project for English 298 Faculty Mentor: Murphy, Samantha Ann

The lack of available organs available for transplantation is a major issue in the American Healthcare system. Despite many different methods of donation, the organ deficit remains steep and many patients die while on the waitlist for an organ. This project discusses the shortcomings of the current organ waitlist and donation system America currently has in place, such as altruism and postmortem donation are not being completely sufficient. Also facing an organ shortage, specifically a kidney shortage, the Iranian government established a legal organ market. The legal market in Iran proved successful, since it eliminated the waitlist for transplant kidneys. While America accepts organ donations from altruistic and deceased donors, it does not currently allow donors to be compensated, like the donors in the Iranian Model. Implementing such a market would greatly improve the current system and potentially resolve the organ shortage. Despite the benefits of such a system, the sale of organs has some ethical opposition, due to fear of donor exploitation and motivation. The project ends with the question as to why America has not yet implemented a system that would greatly benefit its citizens.
**Poster # 272**

*“The War Photo No One Would Publish”: A Comparison of Public Knowledge During the Gulf War and Vietnam War*

Ely, Jenna Katherine

A Classroom Project for English 298  
Faculty Mentor: Addicott, Randi Marie

This paper analyzes the relationship between media coverage of the Vietnam War and the Gulf War and their respective impacts on public knowledge. It investigates the impacts of Kenneth Jarecke’s photography and Nick Ut’s photography as examples of media influence on anti war movements during the Gulf War and the Vietnam War. By drawing connections to the availability of media during the Vietnam War and the size of Anti-Vietnam War movement, it can be concluded that the US government became fearful over the press’ power to influence public opinion at the outbreak of the Gulf War. This contributed to the lack of media coverage from the media pooling system during the Gulf War, which also created pressure upon news organizations to filter and reduce the type of war media available to the public.

**Poster # 273**

*Separating Politics from Studies: How Political Science Majors Form Political Beliefs*

Emerson, Ailsa Collins

A Classroom Project for English 298  
Faculty Mentor: Nicks, Robin Jean Gray

In a hyper-political world, it is difficult to escape from the influence of politics or one’s political beliefs. People are constantly bombarded with political information from sources that contradict each other more often than not. In addition, studies show that personal beliefs impact how a person receives different types of information (Lodge & Taber, 2006). As the role and influence of politics escalates in the country, it is important to consider the views of the people that have devoted their studies to politics. The purpose of this study was to determine how political science majors, the potential future of political analysis, create their own political beliefs, as well as to see how they feel that affects their studies. For this study, three political science majors were interviewed and asked how they formed their political beliefs, as well as how they felt that impacted their studies of political science. Interviewees’ responses were compared to find similarities and differences. This was to determine if there are any patterns or commonalities in how political science students become interested in politics or in the role they feel their personal political views play in their studies of political science. This study is expected to provide insight into what political science majors value when analyzing information in their field, as well as potential biases that exist within their studies. This will provide insight into how analyses of politics may be flawed, which is important because these analyses affect how other people perceive and interpret politics.

**Poster # 274**

*The Ethical Dilemma of Precise Genetic Engineering*

Erickson, Cole Ramsey

A Classroom Project for English 298  
Faculty Mentor: McCue, Kristina

Tampering with genetic material has been a subject of public debate and controversy since it became within reach of science. Because of this, it is anomalous that the new gene editing processes utilizing Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) have seemed to dodge public ire despite the number of ethical objections that may be raised. Even though there are valid fears inspired by CRISPR, it has proven to provide numerous benefits, which makes
going forward with research an ethically viable option. There is a fairly common concern that CRISPR will be used to reinstate eugenics and that germline editing will lead to designer babies. These concerns are speculative and unlikely outcomes, due to widespread public condemnation of these practices, and the general challenges of integrating them into public policy. Although these two consequences are not likely to materialize, the possibilities of CRISPR permanently modifying species and rate at which advances in genetic engineering technology is currently outpacing the legislation regulating it raise some serious concerns. We have already genetically altered various species into new species (Charo 2015), and our current legal framework is not adequate to deal with this situation due to a lack of discussion surrounding the recent breakthrough in genetic modification. CRISPR also has various proven benefits such as the ability to wipe out vector diseases (Cartolovni & Čartolovni, 2017), cure mitochondrial disorders (Furrow et al., 2017), and make better gmos. Due to these concrete benefits and looming risks, this question remains unresolved, and it seems that the disagreement is about the fundamental portion of the program. Further research and reflection must be done in order to ascertain more methods to regulate CRISPR to prevent it from being used for the wrong reasons.

Poster # 275
Gene Therapy: The Controversy Surrounding a Revolutionary New Medicine
Estepp, Allyson Nicole
A Classroom Project for English 298 Faculty Mentor: Murphy, Samantha Ann

Gene therapy is the transplantation of healthy genes into the DNA of a patient. These medicines modify the patient’s own cells to correct a genetic defect. This is an incredibly new process, with research beginning only in the late 1980’s. Somatic cell gene therapy has so far been used to treat monogenetic disorders and some forms of cancer-diseases which were previously thought of as largely incurable. Research into its application for other illnesses is growing rapidly. The ability to correct the root cause of a life-threatening disorder by modifying human DNA has been called a monumental breakthrough in medicine. The success of gene therapy has led pharmaceutical companies to begin hastily investing in and releasing new medication in this vein of treatment. However, this project aims to show that the widespread introduction of gene therapy into the pharmaceutical market is still premature. It examines the controversy surrounding this medicine that is often overshadowed by the sensational promise of a cure. Through the analyzation of the ethical concerns, adverse side effects, and huge economic strain of gene therapy, it determines that there is still further research and extensive regulation necessary in order to keep the pharmaceutical market safe and stable.

Poster # 276
Decreased Federal Funding for Research Amplifies Concern Among Scientists
Everett, Matthew B
A Classroom Project for English 298 Faculty Mentor: Dean, Lance M

Sources of research funding are among the core concerns of researchers. Most researchers affiliated with universities rely on federal funding, such as through the National Science Foundation (NSF) or the National Institutes of Health (NIH). This study investigated the concerns held by scientific researchers at the University of Tennessee, Knoxville regarding the ability to obtain funding after the recently passed Tax Cuts and Jobs Act of 2017 through qualitative interviews. Another component of this study anticipates the effects on university research of both the Tax Cuts and Jobs Act of 2017 and the corresponding Bipartisan Budget Act of 2018. After analysis, this study suggests that the act will not severely affect university research because of the Bipartisan Budget Act of 2018, allowing the federal government to continue investing
in research. However, this study also notes that there will be cuts to federal research funding agencies. Many university research faculty continue to be concerned about sources of funding and the future of research in America.

**Poster # 277**

**How Does Fake News Impact Society**

Fader, Galen

A Classroom Project for English 298  
Faculty Mentor: Barrow, Robin

With the advent of social media as a source of news for many people, the issue of fake news and the spread of deliberate misinformation has only become more severe. As evidenced by numerous sources, there have been concentrated efforts from radical political factions and even foreign powers to target specific demographics with fake news, mainly through online sources, in order to convince them of a particular viewpoint, usually a political one. While the somewhat contentious debate regarding the scale and effectiveness of these attempts continues, most scholars and reporters agree that these misinformation campaigns represent a worrying trend. As people become increasingly adept at disseminating this type of information, the question of how to determine the validity and truthfulness of a source continues to grow in importance. In order to fully answer this question, I first studied current research on the subject to find the academic consensus, after which I conducted interviews to help me get a more in-depth perspective on the issue and find potential solutions in both an individual and a large-scale context. The goal of this paper is to provide a commentary on the state of the debate surrounding fake news, as well to as make suggestions as to how we can minimize its impact.

**Poster # 278**

**An Analysis of Health Care: the Underlying Issues with the U.S. Health Care System**

Fahhoum, Josiah Lee

A Classroom Project for English 298  
Faculty Mentor: Newburn, Harry Fredrick

The ideals of good health and fitness have been pursued since the earliest human civilizations. Today, these ideals are still highly sought. Modern health care systems continually seek to develop new treatments and address their citizens’ needs. The efficiency of every health care system is determined by three factors: quality, accessibility, and affordability. No system has achieved these three factors. Rather, the more efficient systems have balanced them. The U.S. system has repeatedly been rated amongst the least efficient systems in the world. The issues with the U.S. system are easily seen. Costs are too high, and patients do not receive treatment. There are underlying issues with the U.S. system from which these surface problems stem. The U.S. system struggles with three issues: misinformed politicians, its organization, and the influence of beneficiaries. These factors have undermined the ability of the U.S. system in providing accessible and affordable care. Over time, these issues have developed and encouraged a dangerous ideology: the patient no longer comes first. To eliminate these issues, citizens must become aware of the current issues and elect policy makers intent on making effective meaningful reform regardless of their sponsors, status, or election cycle. To investigate this topic, interviews were conducted alongside secondary source resources, specifically sources comparing different health care systems or proposing statistics on the U.S. system.
Poster # 279

The Palaeolithic Diet: Is It the Best Option for Individuals with Obesity or Metabolic Diseases?

Farrar, Emma

A Classroom Project for English 298

Since its rise in popularity in recent years, the Palaeolithic Diet, also known as the Paleo or Hunter-gatherer Diet, has received praise from people within the scientific, medicinal, and nutritional community. Nutrition is a primary factor in deciding whether or not one is living in a healthy manner. In particular, the Paleo Diet has been regarded by many professionals as a nutritional regimen fitting for those at risk of various metabolic diseases due to obesity or currently suffering from one or more metabolic diseases, such as Type 2 diabetes. Furthermore, several studies have demonstrated a host of benefits: overweight or obese subjects experienced fat loss, a reduction in triglyceride and high-density lipoprotein levels, and even improvements in Type 2 diabetes-related memory loss. With all of these advantages, it must be called into question if the Paleo Diet is truly as miraculous as it appears, particularly in comparison with other options such as the diet recommended by the American Diabetes Association (ADA). This paper will examine the benefits of the Palaeolithic Diet and compare them with those of similarly advantageous diets in order to demonstrate that, although many might profit from the these benefits, there are other nutritional regimens that could be equally valuable in fighting obesity and metabolic diseases.

Poster # 280

How do Depression and Anxiety Treatments Differ Across Cultures?

Feathers, Rebecca

A Classroom Project for English 298

Depression and anxiety are two of the most common mental illnesses found all over the world. The widespread issues caused in cultures worldwide by depression and anxiety is extremely high when compared to the accessibility of proper treatment for these illnesses. In developing countries, specifically in Latin America, treatment for individuals suffering from depression and anxiety is almost nonexistent, even though they experience some of the highest rates of depression and anxiety in the world (over 5% for adults in this region) according to Simon et al. (2004). I conducted research using many scholarly sources of studies done on treatment of mental health as well as works done analyzing its predominance in different societies. I also conducted interviews of two individuals familiar with this topic and proper ways to treat it, as well as firsthand experience with the lack of treatment in some developing societies. Throughout my research I have found that in some cases, anxiety and depression derive from environmental and cultural differences as well as parenting styles (Allen). Also, developing Latin American nations have an extreme deficit in not only mental healthcare but healthcare of any sort, however governments are working to get methods of treatment to places that do not have access to them through telecommunication and allocating government funding to accessible health care in communities (Caladas de Almenia 2010). Through my research, I have concluded that there is no uniform way for depression and anxiety to be treated due to significant cultural variations playing a large role in the way these disorders are defined throughout the world.
Poster # 281

Retail Monuments: The Changing Face of American Shopping Malls
Fiet, Lucas
A Classroom Project for English 298
Faculty Mentor: Newburn, Harry Fredrick

The popularity of shopping malls boomed during the post-War era, but American malls began to experience a significant decline in traffic as early as the 1990’s. Decreased traffic has forced tenants to move elsewhere, leaving significant portions of malls vacant. This trend has been attributed to a variety of cultural and economic factors, including the Internet, the Great Recession, and the rise of “big-box” stores such as Walmart and Target. This paper examines current perspectives on the trend, by assimilating academic articles with interviews conducted with veterans of the retail field. It explores relationships between contributing factors and the causes of problems facing today’s malls. Specifically, the study has found that periods of economic turmoil have intensified competition in retail, and new forms of shopping have emerged. These new options compete with shopping malls, but, more importantly, they change the way people think about shopping. This study ultimately concludes that changing attitudes surrounding shopping will have lasting effects on retail, and the opinions of teens and young adults will become increasingly important as they mature and contribute more to the economy.

Poster # 282

An exploration into the growing nihilist persona created by generations X, Y, and Z resulting in popularized challenges such as the tide pod challenge.
Fischer, Robert W
A Classroom Project for English 298
Faculty Mentor: Addicott, Randi Marie

It seems that there is a new challenge popular among kids taking the internet by storm every year. The cinnamon challenge and the tide pod challenge have been two recent examples in the last few years. Their popularity is nation wide in the U.S. because of the popularization of these challenges on social media and the internet. The problem is that now, these challenges have turned from innocent challenges to challenges that cause self-harm. Tide pods are detergent pods, and when ingested can cause vomiting, nausea, and even death in the proper dosages. The origins of the popularization of these challenges seem to be rooted in a recent increase in Nihilist beliefs among generations X, Y, and Z. Nihilism has now entered the philosophy of America as a dominating system of beliefs due to recent economic failure and a lack of trust in our government by the people. This growth of nihilism in America is not only bad for the economy, since people won’t invest in an economy doomed to failure, but it affects the future of society by shaping the minds of the generations of the future.

Poster # 283

Representation of Sharks in the Media
Fox, Kelly Lucile
A Classroom Project for English 298
Faculty Mentor: Brouwers, Marcel
With all of the movies and television shows that highlight sharks as mindless man-eaters, it is no wonder that people tend to be afraid of them. However, this fear is often taken out of hand, with people becoming so frightened that they are unable to swim in the ocean, or they turn their fear into a hatred of sharks. In order to understand why people are so afraid of an animal that is statistically less dangerous than a squirrel, it is important to understand the media portrayal of sharks that gives them such a bad reputation and to compare public exposure to such media with individual opinions of sharks. To see this comparison, researchers conducted a voluntary survey that asked subjects for their opinions on sharks as well as about their exposure to sharks through media such as films and television. The survey was administered through Reddit and received responses from throughout the world, including the United States, Canada, and Europe. The results show an overwhelming majority who are afraid of sharks to some degree and who have seen a film that portrays sharks as villainous. Interestingly, there is also a strong majority who have never had a personal experience with a shark in the wild. Based on the survey, it appears that the public allows the media’s false portrayal of sharks to influence their ideas about them without ever having encountered one.

Poster # 284

The Role of Conformity and Obedience in Dance Injuries

Franklin, Anna Elizabeth

A Classroom Project for English 298

Faculty Mentor: Addicott, Randi Marie

The field of dance science has recognized that intense physical demands, training errors, and physiological weaknesses greatly increase a dancer’s injury risk, but it has largely overlooked the role that social influences such as conformity and obedience have in causing dance injuries. Authority and obedience are powerful social influences for humans regardless, but dancers are particularly vulnerable since they are trained from a young age to obey unconditionally. Teachers and choreographers hold tremendous power over their dancers, and given the demands, mindsets, and attitudes of the dance world, these authority figures can easily abuse their power. Dancers will not question intense training regimes, dangerous stunts, or physical and mental abuse despite the grave consequences, since they have been trained in unconditional obedience often since toddlerhood. Besides issues of authority, dancers also feel compelled to conform to peer expectations. Peer influence impacts a dancer’s decision-making, alters their perception of reality, and increases the probability that they will attempt and approve of risks. These two social influences combined create a dangerous, injury-conducive mindset within the dance world, made even more dangerous by the fact that most researchers ignore or are unaware of its existence.

Poster # 285

The Heritability of Trauma: Its Mode of Transmission and the Implications for Medical Treatment

French, Camille Ruth

A Classroom Project for English 298

Faculty Mentor: McCue, Kristina

The connection between trauma and human health has long been acknowledged but little understood. The field of genetics has not been a factor in the debate, however, because the scientific community has relied upon the classical understanding of DNA as fixed and unresponsive to disruptive events. This view has changed in the past decade as many biological studies have begun to come to the same conclusion: environmental impacts in the lives of parents can have an effect on the physical composition of the brains of their children. This change in perspective is due to the new field of epigenetics, which proposes that trauma can affect RNA – the code responsible for how our DNA is expressed – as in,
which genes "show through" and which do not. With the broader perspective of epigenetics, we are able to observe that the offspring of the sufferers of trauma actually inherit brain chemistry congruent with traumatic brain disorders such as PTSD. This discovery has exposed a large gap in medical understanding with regards to the mental makeup of the children of trauma victims. There have been many theories proposed about the consequences of second-hand trauma, but the most likely answer is that the children’s glucocorticoid receptors are already over-produced at birth, meaning that their brains contain the same structure of dysfunction and disorder as PTSD. The implications of this are vast; the medical community needs to develop a new diagnosis for such trauma-absent trauma disorders. In fact, they may need to develop a new category of mental disorder.

In order to dive into all the consequences, however, we must first develop further experiments in order to determine the exact mode by which inherited trauma is transferred. The understanding derived from these studies could open doors to possible treatment for suffering that has yet to be acknowledged and could give language to describe a common human condition that is only now beginning to be understood.

Poster # 286

Healing the Digital Divide: Bringing Broadband to Rural Areas

Frohlich, Brooke A

A Classroom Project for English 298

Faculty Mentor: Addicott, Randi Marie

This paper looks at the issue of the lack of broadband internet connection in rural America and how that contributes to the digital divide. By examining the current ways that people are trying to bring broadband to rural America, the most effective way can be identified and enacted. This was done with focuses on the economic effects of the digital divide, effective technological strategies to install broadband connections, and the amount and nature of government involvement in the process of designing and installing broadband internet service. Examining longitudinal studies of different counties and comparing their economic growths to their adoption of broadband established the measured effects that broadband has on economic factors such as average income and unemployment rates. Next, the common sense of the differing terrain of these areas across America supports an adaptive, personalized approach to bring broadband internet to rural areas nationwide. With this adaptive approach comes the effectiveness of having the federal government incentivize local governments to develop plans to bring broadband to their underserved areas, as opposed to the federal government itself trying to develop a nationwide plan for broadband internet.

Poster # 287

Is Zero Waste Living a Waste of Time?

Galyon, Sarah Alyson

A Classroom Project for English 298

Faculty Mentor: Addicott, Randi Marie

Although many environmental issues exist in our world today, one that is easily preventable is that of waste. Excessive waste leads to landfill gas emissions that are dangerous to the environment in ways such as greenhouse gases and toxic substances. Waste is dealt with in three ways; sanitary landfills, incineration, and pyrolysis-gasification. Landfills also take up immense amounts of space, and as waste continues to increase, landfills begin to take up more and more space that we do not have to spare. Some people have begun to combat this problem by attempting to live a zero waste lifestyle. This zero waste lifestyle is a way to produce less waste, ideally none at all, accomplished by composting, reusing and reducing, and recycling only if absolutely necessary. This means using compostable materials, materials that last, and
avoiding things such as plastic. Waste can be reduced through simple, everyday choices in your life as well as on a large scale level such as cities and industrial projects.

Poster # 288

Twitter and the Democratization of Language and Content

Gangloff, Nicholas Vladimir

A Classroom Project for English 298 Faculty Mentor: Addicott, Randi Marie

Twitter and other social media have taken on larger roles in the lives of their users by transforming the way they communicate and share content. Twitter specifically revolutionizes this practice by enabling users to exponentially expand their audiences with retweets, allowing for a new democratization of language and online content. Sociologists and computer scientists have begun to theorize Twitter and study its uses through news organizations, celebrities, and politicians. Formerly, these types of users were the only ones who could reach large audiences because of follower bases that had been amassed before Twitter and the ability to invest money into an online presence. Now, it has emerged that any individual on Twitter may reach this status. Exactly how and why still remains to be discovered, but democratizing social media and its content is a societal development on Twitter that benefits society in real life by allowing more people to speak and more opinions to be heard. Minorities thus gain a potential platform for representation, people have more choices when it comes to the content they want to consume, and there appear more opportunities to establish and sustain online networks. Twitter is a unique societal phenomenon that uses language, content, and networks to virtually reorganize human civilization online.

Poster # 289

Fighting Back: The Impact of Virtual Reality on Treating PTSD in Combat Veterans

Genereaux, Zachary Robert

A Classroom Project for English 298 Faculty Mentor: Murphy, Samantha Ann

In recent times, the United States has been involved in many foreign conflicts, particularly in the Middle East. American soldiers have fought for our country in many different venues. These soldiers have made many sacrifices in war, such as injury, time away from their families, or even death. However, many combat veterans are still suffering from their time in the military through Post Traumatic Stress Disorder (PTSD). We are facing an enormous crisis in our country, as thousands of veterans have committed suicide due to PTSD-related depression. While PTSD can be treated in many different ways, Exposure Therapy seems to be the most effective treatment option. Developments in technology have contributed to the formation of a new option for exposure therapy provided for combat veterans: Virtual Reality Exposure Therapy (VRET). This project examines how Virtual Reality has proven to be effective in helping veteran PTSD victims to overcome the symptoms of PTSD, and why VRET should be further researched and made more available to combat veterans. PTSD is a serious issue that has affected so many veterans, but with the recent development of VRET, the number of victims can be significantly decreased.
Poster # 290

Virtual Reality: A Reality Improvement?

Gilson, David Bryon

A Classroom Project for English 298

Faculty Mentor: Gentry, Elizabeth Leigh

Is virtual reality a gimmick, or does it have true potential in the modern world? This essay is a response to the skepticism of virtual reality (VR) and its value in modern and future society. While VR technologies are still being developed, much research has been conducted in various fields to prove VR’s applicability. In the medical field, surgeons receive improved performance while training prior to surgery with VR. The military uses VR and AR (augmented reality, a similar technology to VR) headsets for various types of simulations, such as squad training or flight training, with results indicating real-world performance enhancement. The educational environment benefits with diverse VR learning experiences and increases in student motivation to learn with VR, and the use of VR has been shown to be an effective therapeutic method during painful procedures, such as chemotherapy. All of these current developments, along with future developments and technological enhancements, show that VR technologies are viable tools for society instead of just devices for pure entertainment as many would think.

Poster # 291

Psychology of Architecture: How Designers Control the Spaces They Create

Gingerich, Olivia Grace

A Classroom Project for English 298

Faculty Mentor: Addicott, Randi Marie

When most people walk into a space, they do not think or wonder about who designed it, what thoughts went through the designer’s head as they drew up plans, why that exact wall hue was chosen, or if there are other reasons for that column besides support. Sure, sometimes these details are chosen at random or carelessly decided upon, but more often than not they are dictated with the utmost consideration. This sets great architectural works apart from others. Great architects design spaces down to the last detail to convey a particular feeling, action, or atmosphere. Considering these aspects can transform a space and create an otherwise unparalleled experience. Architects who explore the use of principles of environmental psychology, such as proxemics, create successful designs that give them control over occupants of the space.

Poster # 292

'Planet X' as a Conspiracy Theory: A Qualitative Study

Glass, Katherine Elizabeth

A Classroom Project for English 298

Faculty Mentor: Brouwers, Marcel

There is much controversy regarding the existence of a tenth planet ten times the size of Earth hidden in the realm known as the Kuiper Belt that lies beyond Neptune. This undiscovered planet has obtained the name ‘Planet X’, and some have twisted the idea of this planet into an end-of-the-world conspiracy theory, predicting the planet to crash into Earth. This paper researches the opinions of non-conspiracy theorists on conspiracy theorists and in what ways non-conspiracy theorists use insufficient evidence to come to a conclusion, similar to conspiracy theorists. We collect data through a survey distributed to approximately 50 individuals of a similar demographic in which we ask questions about views on
conspiracy theories and conspiracy theorists. The results show that most individuals believe conspiracy theorists are probably correct, but do not have sufficient evidence, and at the same time use insufficient evidence every day to jump the conclusions.

Poster # 293

Ménage à Moi: Female Masturbation and Confidence in Western Culture

Goluoglu, Ashley Aslihan

A Classroom Project for English 298

Faculty Mentor: Murphy, Samantha

Everyone knows that men masturbate. Popular Western culture has normalized this act to the point of banality; even girls know just exactly how boys do it. But while there are numerous studies and papers which argue the benefits and dangers of male masturbation, even in the midst of the fourth wave of feminism there are very few which give female masturbation its due diligence. Fewer still focus on what exactly masturbation and sexual freedom mean for a woman’s confidence and independence. This project works to connect several studies and first-hand testimonies to prove a correlation between women’s self-esteem and how the female body reacts to self-pleasure through the release of hormones known to contribute to mental health. Societal guilt from participating in an act stigmatized in Western culture prevents many women from being truly confident in their bodies, minds, and actions. Women who lack this guilt are more assertive about their needs both in the bedroom and in daily life, demonstrating how the condemnation of female masturbation negatively affects women. Being able to comfortably pleasure themselves gives women more freedom and power in their partnered sex lives and makes them more satisfied and self-assured in their platonic and business relationships.

Poster # 294

Melungeon Identity: The Effects of History and Genetic Discovery

Gowda, Chaitanya C

A Classroom Project for English 298

Faculty Mentor: McCue, Kristina

The Melungeons of Tennessee were a group of Americans with unknown or ambiguous ethnic origin. Being discriminated against for their race, many Melungeon isolated themselves from their community. The paper attempts to identify the problems with interpreting the differences between the myths and folklore versus the genetics of the Melungeons. As some history and genetics coincided, mainly the fact that Melungeon genetic history indicates European DNA. This is supported by Brodwin’s study results. The results of the research were partially based on the genetic research project done in the early 2000s, as described by Brodwin (2003). Although the project had a small sample size, it found that the Melungeons were a multiracial group of Americans with European, Native American, and African American descent. Many of the myths and folklore, such as descendants of Phoenician sailor or as descendants of Jewish tribes of Israel, about the Melungeons held true to themselves for many years were thus disproven. The Melungeons’ identity discovery has implications outside of their group. It could serve as an example of the discontinuity between folklore of the past and the genetic discoveries of the present, as well as serving an example of how multiracial groups come to terms with their identity as genetic identity technology becomes more advanced.
A Polity Apology: Investigating the Understanding of Political Apology

Green, Jacob Craig

This study deals with public perception of political apology. Having been defined as a form of two-way communication, apology is an often-absent conversation between the public and their representatives. When the public is wronged by figures tasked to embody the general will, genuine remorse is rarely expressed and even less frequently does it exempt such figures from consequence. Drawing from interviews with a former public servant, a current one, and an informed private citizen, this study will detail their responses to questions concerning blame, forgiveness, and the extent to which someone’s personal life belongs to the many, aiming to synthesize the general understanding of such apologies and craft an understandable approach to reconciliation between politicians and their publics following social harm.

The Effect of Teacher Turnover on the Achievement Gap

Grizzard, Lane Ericson

In America, a severe inequality exists between the achievement levels of high-poverty students and low-poverty students. Students in high-poverty environments tend to have lower achievement levels than students in more affluent schools. However, the role of teachers in the achievement gap is the largest driving factor for this inequality. The achievement gap is ultimately occurring because of the high teacher turnover rates in high-poverty schools and the lack of high quality teachers creating positive student-teacher relationships. Extensive research shows that high teacher turnover rates have had a negative effect on students causing student success level to drop, specifically in high-poverty schools. Thus, students in high poverty schools suffer, because they are more likely to need high-quality teachers in order to create a positive learning environment and to establish positive student-teacher relationships. There are other factors that affect the achievement gap; however, the impact of teachers on students’ education has shown to have more of a direct effect on students’ achievement levels. In order to close this achievement gap, the education system must focus on putting high-quality teachers back in high-poverty schools in order to give students in less affluent areas an equal opportunity to achieve in education.

Social Media and Politics

Hammon, Julia Claire

Politics has been changed irreversibly since the introduction of social media. Interactive media platforms have changed the way campaigns are run, donations are received, advertisements are spread, politicians are heard, and protests are organized. These changes have been beneficial to both the constituent and politician. People can rally and spread protest information faster than ever. Movements such as Black Lives Matter, Occupy Wall Street, and the Women’s March were all popularized through social media. Additionally, politicians can spread their message more quickly and cost effectively.
Moreover, social networking sites bypass the traditional media and allow politicians to make statements without the interference of a third party. Younger and more diverse populations have also been drawn into political participation through their use of platforms like Facebook, Twitter, Instagram, or YouTube. At the same time, the public now has an instant line of communication directly to elected officials. There are some concerns about increased party polarization and the “echo chamber” effect of only seeing the opinions of your likeminded friends, but both issues are inconsequential when faced with the benefits. Overall, the speed, mobility, low cost, popularity, and communal nature of social media has made it the ideal venue for politics.

**Poster # 298**

**How Video Games can be used to Enhance Education**

Hardin, Elijah Lee

A Classroom Project for English 298 

Faculty Mentor: Murphy, Samantha Ann

Since the early 1970's, video games have invaded the homes of millions of people worldwide. Shortly after this rise in popularity, the public began to stigmatize the effects of video games on children. The consensus that many came to during this time is that video games lead to lower intelligence and defective personalities in children. This stigma that video games inherently cause children to become less productive in life is false. In fact, the opposite is true. This project analyzes studies on how video games, educational and recreational, are beneficial to develop learning habits as well as essential life skills such as communication and adaptability. It also analyzes how video games can be used as a tool for education in schools so that students are more easily engaged with the content that they are learning. In conclusion, it is important that the stigma surrounding video games is broken so that their full potential as an educational tool can be realized thus improving the quality of education for children across the world.

**Poster # 299**

**English 298 Qualitative Abstract**

Hawks, Sarah Margaret

A Classroom Project for English 298 

Faculty Mentor: Dean, Lance M

Across the country, students face the dread of having to take an early morning class. This worry comes at odds with research that shows that students perform better when they begin their schooling later in the day. This piece discusses the issues caused by early class start times and addresses possible solutions to these problems. This is accomplished by approaching this subject from multiple views. First, a logical perspective. The data that currently exists is reliable, credible, and consistent. The science shows that later start times are better. The second perspective is that of the experiences of the people who have to deal with this, particularly that of the faculty and the students. This was done by interviews and a survey. Most students are not enthusiastic about the idea of having to take an early morning class, and in fact most try everything in their power to avoid doing so. With these two points, it must be asked, why then is that not the norm? Why are early morning classes still in effect? These questions lead into the third perspective, which that of the logistics. Schools are pressed for classroom space and teaching staff. In order to accommodate all the classes that they must offer for their students, they often have no choice but to offer them earlier in the day in order to maximize the efficiency of the school day. This study then goes to suggest possible solutions, such as class registration order, distance learning, help with time management, and wider awareness of the effects of sleep deprivation.
Poster # 300

Faith: Where Religion and the Real-World Meet

Heard, Braxton Norris

A Classroom Project for English 298

Faculty Mentor: Nicks, Robin Jean Gray

When looking at the background of every major religious group, all of their founders share a common similarity. They all realized, through some kind of life-changing experience or moment, just how strong their designated faith in something was. This study examines the trends in religious belief and empirical knowledge and how they go hand-in-hand in understanding the true meaning of faith. To accomplish this, interviews were carried out in which people from various religions were asked questions that would provide adequate information involving personal encounters they’ve had in which with their religion was involved. From these interviews, it was discovered that there was a very strong connection in empirical knowledge and religious belief, as the majority of the people being interviewed shared an experience that “confirmed” their belief more than any other person could. From these results, the idea centering around the word “faith” solidified into what many people see broadly as religion today. These people, just like their religions’ founders, understand who they are and have the proof to combat against anyone who tries to strip them of it.

Poster # 301

The Impact of Imported Superfoods

Heck, Zophia Hannah

A Classroom Project for English 298

Faculty Mentor: Newburn, Harry Fredrick

In the form of the newest trend, superfoods are being imported from all across the globe to end up as the latest post on social media. While the hype surrounding these foods is that they are super healthy with many benefits, like antioxidants and vitamins, people seem to perhaps care more about sharing that they ate them. This is causing people to overlook the consequences their latest trend has on the world. People may appear to be getting healthier by participating in this fad, but the importing of these foods is hindering world development by worsening global climate change and poverty in communities. Natural resources are lost in increasing amounts with every ship that transports these superfoods. Communities cannot afford their own crop as the price increases with each harvest. My research focuses in on what exactly this superfoods trend is doing to the world and what exactly can be done to end this. I am hoping to emphasize that the health benefits of these foods are not worth the impact it is having on Earth. I highlight that the simple solution to prevent all of this from happening is by purchasing food locally. Not only will food not need to be transported and be adding onto gas emissions, but local communities will be supported.

Poster # 302

Rapid Disappearance: Exploring the Social and Economic Effects of Tropical Deforestation

Hendrix, Emma E

A Classroom Project for English 298

Faculty Mentor: Nicks, Robin Jean Gray

Tropical deforestation has existed for thousands of years, but recently, it has been taking its toll on the environment more than ever before. Deforestation is affecting the earth’s environment because it destroys habitats and affects the climate, but more than this, humans have begun to feel the effects of tropical deforestation economically and socially. Little
research has been done on how deforestation is affecting humans, and therefore this project seeks to understand how adults perceive tropical deforestation and its impact on humans. Several adult interviewees who are involved in a science field discuss their perceptions, values, and knowledge related to tropical deforestation and its effect on humans. Through the analysis of these interviews, themes and recurring ideas will provide information on how aware and concerned adults are of the rapid disappearance of tropical rainforests. The aim of this work is to determine if people are concerned about deforestation and if people believe it has environmental, social, and economic consequences that affect humans. From these findings, organizations may be encouraged to inform a larger population about how tropical deforestation has a direct impact on their lives.

**Poster # 303**

**The Illegitimacy of “Race” as a Heritable Marker**

Henley, Danyel Payge

A Classroom Project for English 298

Faculty Mentor: McCue, Kristina

The understanding that race is a potentially meaningless phenotypical descriptor, not passed down genetically, developed with the relatively recent discovery of DNA. Race is an integral part of one’s personal identity, and dropping the concept completely could seem life altering for many people. This poses the question of whether race is a truly useful factor of identity when examining differences among individuals who, genetically, may be very similar. The debate about race has reached a peak, with biologists, sociologists, psychologists, and even philosophers analyzing the relevance of race through research. Overall, the implementation of “shared ancestry” as an identifier may prove to be the superior categorical tool over “race” for researchers seeking to more precisely examine a population. This research paper examines the etymology of the word “race” in conjunction with the biological determinism that underlies the current presence of racism found in many societies. Biological determinism is the belief that genetics determine the way that people think and act. With “race” becoming less of a genetic marker and more of a social construct, the concept of “race” determining the way an individual’s character— and society’s subsequent perception of that individual — still remains, leading to the social, economic, and psychological conflicts of racism. Of the research collected thus far, there is a clear drive towards the removal of race from biological categorization. By attempting to replace “race” as a divisive categorical tool with “ancestry”, the history of the human lineage can become more fluid than the previous conception of definitive ancestral identity. Out of this fluidity could emerge the unification of individuals who would otherwise remain separated by skin color.

**Poster # 304**

**The Need for Better Education About the Poultry Industry for the Common Consumer**

Hessock, Emma Annemarie

A Classroom Project for English 298

Faculty Mentor: Newburn, Harry Fredrick

Consumers are the driving force behind what products are made and the materials that are used to produce them. If consumers find an issue with a product it is the producer’s duty to fix the problem in order to prevent the loss of revenue that would occur from the possible decrease in business. The poultry industry faces this issue daily with consumer demands forcing radical changes to occur within it, ranging from increasing the welfare of the animals, reducing the usage of hormones and antibiotics, and having strictly pasture-raised birds. The demands are influenced by misinformation and a general lack of knowledge on how the poultry industry works, thus negative effects have surfaced from the changes
made to appease consumers. Increased education on the poultry industry needs to be made for the public in order to prevent further adverse changes from occurring. By furthering consumers' knowledge on the actual processes used within poultry production, they will be able to make more informed decisions on what aspects of the industry actually require revisions.

**Poster # 305**

**A Major Choice: Methodologies Utilized by Undergraduate Students to Determine Their College Major**

Hewitt, Jacob T

A Classroom Project for English 298

Faculty Mentor: Nicks, Robin Jean Gray

Research shows that choice of college major has at least a moderate impact on the career trajectory of graduates (Carnevale 2018). This study observes students' choice of major by obtaining qualitative data through interviews with three individual students. Students were solicited through the University of Tennessee Knoxville’s Chancellor’s Honors Program, and all respondents majored in an engineering field. Although limited in scope, this study finds that college students understand the importance of their major and delves into their primary motivations behind their choice. These findings may encourage educators and employers to better understand the concerns and motivations of their students, and encourage other undergraduates to analyze their own choice in major.

**Poster # 306**

**The Modern Approach to Designer Babies**

Hickman, Peyton Garrett

A Classroom Project for English 298

Faculty Mentor: Addicott, Randi Marie

Gene selection is a practice that promotes the survival of species; qualities or features that are better adapted to an environment will be passed down due to natural selection. Old methods of gene selection were as basic as choosing based on appearances or physical characteristics. Modern gene selection in human embryos is termed as creating a designer baby. The creation of these genetically modified embryos is highly controversial in both the experimentation and the potential actual use. The purpose of this study was to use secondary sources to show how experimentation with modified embryos can be beneficial and how the actual use of these techniques to create living designer babies could be legalized with minimal controversy under the restriction that they be solely used for medical purposes.

**Poster # 307**

**Video Games, Aggression, and Internet Gaming Disorder: Where We Stand Today**

Hicks, Philip J

A Classroom Project for English 298

Faculty Mentor: Gentry, Elizabeth Leigh

The notion that violent video games cause aggression has been held since Craig Anderson’s meta-analysis was released. New research gives more evidence to there being no correlation between the two. While we can’t say for sure that video games don’t cause aggression, it certainly appears that way. Internet Gaming Disorder is much newer then aggression but has become a more serious problem in the past couple years and its definition and diagnosis are still up in the air. Evidence
presented in Internet Gaming Disorder studies suggests that IGD is the manifestation of preexisting factors in the form of problematic use of video games. This means that video games are not to blame for the negative effects of IGD and aggression could be a similar case. In fact, if video games are played in a healthy way, such as playing to connect with people of similar interests, they can counteract some of the preexisting factors like depression. However, there is a need for more large-scale longitudinal studies designed with the help of gamers to nail down definitive answers about aggression, help prevent gamers from falling into Internet Gaming Disorder, and use gaming in a way that is beneficial to them.

**Poster # 308**

**Mother's Perceptions on Genetic Engineering**

Hill, Ashtyn Marie

A Classroom Project for English 298 Faculty Mentor: Nicks, Robin Jean Gray

This paper uses qualitative research to investigate how mothers who have undergone artificial insemination, IVF, and traditional conception perceive the idea of advancing genetic engineering technologies. These new technologies are paving the way for medical advancements through genetic engineering; such as the possibility to cure diseases. Interviews focused on whether these advancements should be implemented for medical uses, and when medical personnel should draw the line when it comes to this process. This paper uses interviews from four different mothers and various secondary sources to retrieve a better understanding of what these advancing technologies could possibly mean for future medical practices. Interviewees’ responses were used to reveal differences and similarities about mothers’ perceptions about genetic modification. This paper increases our understanding of advancing genetic engineering technologies and mothers’ perceptions on the subject of genetic engineering. The research could lead to medical professionals in this field being better able to connect and understand their patients.

**Poster # 309**

**How Political Polarization Affects Fake News**

Hill, Nicholas Isaiah

A Classroom Project for English 298 Faculty Mentor: Brouwers, Marcel

One of the major controversies of the 2016 election was the potential influence of fake news on the outcome. There has been much debate about the sources and the kinds of fake stories that circulated around the internet, particularly social media. In this survey, researchers ask the respondents how they voted and their online news gathering and social media habits to see if there are any kinds of correlations between political affiliation and philosophy and their reactions to fake news and their impact on American politics. This survey was distributed on several social media sites (Facebook, Twitter, Groupme, Reddit) and was designed for American citizens eligible to vote in the United States to analyze political polarization as it relates to fake news within the United States. The findings seem to indicate that political polarization has little to some effect on how people, especially young, educated Southerners, perceive fake news. More research needs to be with other demographics to fully the average American perspective on this issue.
Poster # 310
**Social Media Marketing: A Necessity**
Holt, Sarah Virginia
A Classroom Project for English 298 Faculty Mentor: Addicott, Randi Marie

The purpose of this research is to show that social media marketing is a necessity for businesses and that businesses should consider if advice on how to use social media is relevant for their company before enforcing it. Today, a huge majority of people use some form of social media and encounter advertisements on it. To understand why social media marketing is important for businesses, the large number of people using social media must first be looked at. The main challenge in marketing on social media is that it is often seen as easier than it is, and therefore companies do not invest the time, money, and commitment into it that they should. Advice on how to successfully use social media marketing is available, but not every step is applicable to both large and small businesses. Additionally, social media is a marketing tool for not only businesses, but also for campaigns and branding. Influencers are now used to target Generation Z, among all other social media users. Although generally positive for marketers, customers experience the negative side of social media marketing through increased impulse purchasing and being deceived due to no fact checkers. In conclusion, social media marketing is essential in being a competitive business, but large and small businesses need to take different approaches to their marketing styles.

Poster # 311
**Smartphone Addiction and its Potential Dangers**
Horn, Anna Kathryn
A Classroom Project for English 298 Faculty Mentor: Barrow, Robin

Previous studies have determined that excessive usage of cell phones has led to many negative changes in our culture. These problems range from anxiety diagnoses to attention span disorders to reduced face-to-face interaction. Because of these reoccurring problems, there are many questions about how cell phones will affect the behaviors, attitudes, and lifestyles of individuals who have grown up in a world consumed with smartphone usage. Due to this curiosity, I decided to investigate what makes smartphones seemingly addictive and what potential dangers will result from overuse and obsession with smartphones. By conducting interviews and acquiring secondary research, I determined that cell phones are addictive because of the constant feedback that they provide and the brain's reaction to this continuous entertainment. Then, this study extrapolates on how this obsession will affect socialization, attention span, and the well being of obsessive cell phone users. Primarily, the goal of this project is to discover why phones are so impactful on this generation and to raise awareness about the dangers of over utilization of cell phones.

Poster # 312
**College Students’ Perceptions of Physical Education in Grades K-12**
Hounshell, William Jackson
A Classroom Project for English 298 Faculty Mentor: Nicks, Robin Jean Gray

Physical education has become an area of disagreement and tension. As Bray et al.
(2010) claim, many opposers of physical education suggest that the time allotted to physical education classes should be spent in an academic classroom (1515). By interviewing three college students who have participated in physical education, perceptions and knowledge of physical education have been obtained. New information about college students’ perceptions of physical education’s effectiveness and favor will be known and understood. Knowing the ways in which college students support or object to physical education allows educators and students in grades K-12 to benefit. This can be done by understanding the complaints and concerns of those who have participated and applying those suggestions into physical education’s curriculum. Many college students will be parents, and knowing their perceptions of physical education can provide reasons and predictions as to why parents will support or object to physical education classes in grades K-12.

**Poster # 313**

**The Eastern Hemlock: Preserving a Population in Decline**

Houston, Austin C

A Classroom Project for English 298

Faculty Mentor: Murphy, Samantha Ann

The Eastern Hemlock is the largest coniferous tree in the Eastern United States and a foundation to ecosystems in state parks and backyards across North America. Hemlocks grow along rivers and provide shade and structure for aquatic life, making them invaluable to their environments. Despite their importance, these pillars of ecology have recently been under attack by foreign invaders, and the ramifications are more than ecological. Adelges Tsugae, or woolly adelgid, is an invasive species that is driving the eastern hemlock to endangerment. This raises economic concerns, as multiple past examples of improperly handled invasive species (like the emerald ash borer) have proven detrimental to national and local economies. Even though extensive research has been conducted on treatment options for the woollies, state government agencies are too ill funded to implement these options. The purpose of this project is to raise awareness on the threat of woolly adelgid and encourage action in local and state governments, as well as impassioning the people of the Appalachian Mountains to defend the local ecosystem.

**Poster # 314**

**The Effects of Architectural Determinism**

Houston, Briley Grace

A Classroom Project for English 298

Faculty Mentor: Addicott, Randi Marie

Architectural determinism is a field whose validity has long been contested but is becoming increasingly relevant in evaluating the success of a design today. The effect of architecture on its viewers’ emotions and actions can be seen through an analysis of hostile architecture, and an evaluation of war memorials expounds on how material objects further control us. Additionally, analyzing the give-and-take relationship between architecture and its viewers is necessary in fully understanding the profound power it holds over us.

**Poster # 315**

**A Flexitarian Diet**

Hovdet, Abigail Camille
Poster # 316

False Propaganda in Nazi Germany: A Qualitative Study

Howe, Caroline Sage

A flexitarian diet is flexible and it varies widely based on how much meat a person consumes. Most importantly, it is a diet that could be a transition diet for people wanting to eventually cut out meat entirely. Environmental factors such as contributing to greenhouse gases and pollution can drive the desire to cut out meat. This can also be seen as an ethical issue to many. The nutritional component can cause some concerns such as not getting the needed nutrients, but if conducted right can bring many health benefits, such as weight loss. If everyone followed some version of the flexitarian diet, people and the environment would benefit from it.

Poster # 317

Positive Human-Robot Interaction: How Social Robots Will Shape the Future

Howell, Bryson Lloyd

Recent developments in the field of human-robot interaction (HRI) have the potential to greatly benefit society. Although there are some major concerns related to the development of social robots, socially responsible research in HRI can address these concerns to safely bring social robots into society. Social robots become more user-friendly due to the development of HRI can lead to an age of pervasive computing where computers can be integrated seamlessly into various aspects of our daily lives. Pervasive computing has the ability to drastically change society by offering solutions to previously unsolvable problems, improving the world.
Poster # 318

Bit by Bit: Building Effective Bitcoin Regulation

Howell, Spencer Lee

A Classroom Project for English 298

Faculty Mentor: Gentry, Elizabeth Leigh

As Bitcoin and other cryptocurrencies have become more widely used, they offer benefits of security, transparency, and convenience over traditional currencies to both businesses and individuals. However, some users have taken advantage of the anonymous nature of cryptocurrencies to conduct illegal transactions and evade taxes. Current regulation for cryptocurrencies is fragmented and disorganized worldwide, resulting in little being done to stop these crimes. However, some policy-makers are proposing new legislation that would remove the anonymity of cryptocurrency users to government bureaus. This research argues that monitoring Bitcoin in this way would stifle its innovative potential and concludes that policymakers should take a lighter approach to cryptocurrency regulation. Other lawyers have proposed regulating the intermediate organizations involved with Bitcoin purchases, an approach that would both increase consumer safety and prevent crime. Policymakers around the world may ultimately be responsible for the success or failure of cryptocurrencies, and through reasonable and measured policies, the benefits of cryptocurrency can be preserved.

Poster # 319

The Currently Inescapable Cycle of Nurse Turnover and its Inextricable Link to Stress and Salary

Huff, Eva Joy

A Classroom Project for English 298

Faculty Mentor: Dean, Lance M

On the surface, it seems as if nurse retention would be a simple subject with a straightforward solution – happy nurses stay, unhappy nurses leave. So, it seems, in order to avoid turnover, we must endeavor to make nurses happy. But after years of research, the answers are neither simple nor straightforward. A multitude of factors lend to the problem of nurse turnover and retention, and these multivariate factors then differ by region, hospital, and changing government policies. Currently, nursing turnover is seen as an inescapable cycle due to the multitude of factors involved that are difficult to extricate from each other. In order for this phenomenon to cease, the attempt must be made to isolate contributing factors and approach a solution to them. This paper evaluates multiple studies on nurse retention and its effect on patient care, as well as presents firsthand accounts of the field-permeating impact that turnover has on a nurse’s daily work. I conclude that higher pay, coupled with higher staff rates, leads to higher nurse retention which, in turn, leads to greater patient care and satisfaction.

Poster # 320

The Ethical Dilemmas Inherent in Medical Research

Huffstetler, Benjamin Brooks

A Classroom Project for English 298

Faculty Mentor: Barrow, Robin

Many populations around the United States and indeed around the world are being adversely affected because they have not had adequate medical research directed towards their benefit. In this paper, I am seeking to explore the extent to which the progression of medicine should be weighed against ethical concerns regarding informed consent of members
of vulnerable populations, in this case the young, old, and those in emergent condition, taking part in clinical trials. I conducted interviews with members of the research community to gauge their opinions and ideas on how to best address this issue. It seems as if the solution to most ethical dilemmas in medical research are to be found in trusting physicians to make the best decisions for their patients, rather than expecting them to attempt to follow overly rigid guidelines. In addition, simplified consent procedures would go a long way in making sure communities typically under-represented in medical research begin to see more representation.

Poster # 321

The Impact of Celebrity Advocacy and Human Trafficking Coverage

Hunt, Ashley Nicole

A Classroom Project for English 298

Faculty Mentor: Murphy, Samantha Ann

The rise in mass media has created a market for celebrities to champion advocacy campaigns for human trafficking. Since the latter half of the twentieth century, as the relationship between public figures and the general public grew stronger through increased communication, these advocacy campaigns have become larger but, somehow, not more influential. Although research on the subject points to the inconsequential nature of such campaigns, its effect on public opinion and activism has not been addressed. This project examines the impact, or lack thereof, that celebrity-driven advocacy campaigns have on informing and shaping public opinion. In addition, it identifies the culture of re-exploitation of trafficking victims and offers new methods through which it is more effective to raise awareness. The current state of advocacy places focuses on matters that do not actually address the realities of the issue or benefit victims. Because of this misrepresentation, the general public is aware of the issue but remains uninformed and inactive regarding measures which can be taken to actually fight the prevalence of human trafficking. Thus, new forms of advocacy should be undertaken by celebrities to not only protect victims, but also to correctly inform and encourage people to actively support the cause.

Poster # 322

It’s More Than Just a Game: Perceptions of the Professional Sports Industry

Hurley, Rachel C

A Classroom Project for English 298

Faculty Mentor: Nicks, Robin Jean Gray

Recently, the professional sports industry’s ideals have transformed into a focus all about money and financial gain. Every year, we see athletes’ salaries increasing and hear about the alterations of the games, but no one pays attention to how these changes affect passionate fans who watch the games. These changes affect a variety of aspects of the game ranging from the TV production to outcomes of certain games. Much of the literature focuses on the aim for profit maximization of sports teams, but none examine the people’s opinions of that aim. This study identifies some of those opinions and perceptions of the sports industry through qualitative interviews with avid professional sports viewers. The analysis of my research yields a perceived loss of integrity of the game from distractions such as athletic fame, advertisements, and predictability. These findings attribute to the larger narrative describing the lost art of sports. This project will contribute to future research on similar topics and could be used to discover the extent of how much the economic side of the industry affects the game.
To Pimp a Butterfly’s Impact on the Hip-Hop Community

Hyde, Thomas Cawood

Although race relations have improved in America over the past century, there are still numerous racial issues that need to be solved. The African American community speaks out against black prejudice in a number of ways, but the most interesting, and one of the most effective, ways is through the use of hip-hop. Eleven-time Grammy winner Kendrick Lamar is the champion of the hip-hop community. He speaks out against racial prejudice in every one of his albums. One of his albums, however, stands above the rest when it comes to Lamar’s discussion of racial discrimination. Lamar’s 2015 album To Pimp a Butterfly tackles all sorts of racial topics such as discrimination in public, the institution of the “hood”, and the demands that America places on the black community. The album has religious undertones and it explores depression, self-love, and the importance of understanding your roots. This project attempts to explore these subjects within To Pimp a Butterfly and to understand this album’s overall impact on both the hip-hop community and the nation’s perception of modern racial issues. The larger goal to which this project contributes is to understand the significance of hip-hop on solving social issues.

Studying Abroad: Its Benefits and Advantages for College Students

Ingell, Sarah Faith

The study conducted for this research project was founded on the question about whether studying abroad during one’s college career is actually beneficial long term. The methods used to examine this question was by means of interviewing three experts on the subject of studying abroad and a review of literature. The study examines whether studying abroad builds critical thinking skills and helps those who participate in such programs to have a better job-hunting experience than their colleagues who didn’t study abroad. Studying abroad has become increasingly more popular during recent years amongst college Americans and it does seem to be giving them an edge over others who haven’t. Employers appear to value potential employees more who have either studied, interned, or lived abroad as having better critical thinking skills, are better able to work as a team player, and being more flexible. This study concludes that students who have studied abroad have a considerable advantage over those who haven’t.

Mental Media

Iqbal, Omar

Social Media can be a pervasive influence on many people. It has the possibility to elicit a wide range of emotions, from negative feelings such as anxiety, to positive feelings of self confidence, especially in the young adult population. In one subset of social media users, the student population, these fluctuations in mood can have a significant effect on academic performance. By interviewing 3 current students at UTK, the link between social media and mental effects on students
who partake in it was investigated, and solutions to the negative byproducts of social media, such as procrastination, were discovered.

**Poster # 326**

**The cost effectiveness of tissue engineering and effect on economic accessibility**

Jansen, Matthew Daniel

A Classroom Project for English 298

Faculty Mentor: Newburn, Harry Fredrick

This paper aims to find the economic benefits of engineered tissues by examining the costs that go into tissue engineering and the making of 3D printed tissues, in comparison to regularly donated organs. By investigating the components of the cost of organ transplantation, possible reductions that could be provided by these tissues were discovered. It found the use of personally engineered tissues would be able to show many possible benefits such as better transplantation and lowered tissue rejection which would increase economic accessibility of organs. Based on these results it is concluded that the development of engineered tissues would allow for more people to afford these organs. It is recommended to verify the results by using data that tests health and other benefits of 3D printed personalized tissues to other transplanted tissues to see if they show any pros or cons. Additionally, tests to see if it would be economically viable to print organs instead of taking them from an organ donor.

**Poster # 327**

**Teacher and Student Perceptions of Online Versus Traditional Courses**

Jarjoura, Joelle Marie

A Classroom Project for English 298

Faculty Mentor: Dean, Lance M

Teacher and Student Perceptions of Online Versus Traditional Courses Abstract

Since the turn of the century, online courses have been rapidly evolving and growing in number, types, and delivery methods. As a result, professors must be trained to develop and utilize the online system and teach students without face-to-face interaction. A review of the peer-reviewed literature demonstrates that online courses, when formatted and implemented properly, are as effective as their traditional counterparts. Peer-reviewed studies, secondary research, and personal interviews with students, instructors, and administrators were utilized to collect data and examine the advantages and disadvantages of online classes and how the initial attitudes of students and instructors affect their teaching and learning outcomes. The results indicate that flexibility is the main advantage of online courses, while lack of face-to-face interaction is the main disadvantage. The initial attitude of a student or professor had a significant impact on their performance in online courses, as professors and students who began with open minds and positive attitudes tended to thrive, while those who excessively worried and had a negative mindset experienced setbacks and undesirable outcomes. In conclusion, the results further support the online education model and, importantly, suggest that faculty and student attitudes and perceptions have a key role in impacting their experience and satisfaction with online courses.

**Poster # 328**

**Analyzing the Adequacy of High Schools**

Jenkins, Cooper Cloud
More now than ever, college has become a necessity for younger generations to attain desired jobs and futures. The problem with this, however, is that high schools are not preparing students for the college education that they need. With the importance and costs of colleges being at an all-time high, the average retention rate for colleges in America is only 61 percent. Freshman coming into college are facing large rises in class difficulty and new responsibilities for which their high school education never prepared them. While many students may drop out of college for nonacademic reasons, most quit college because of unpreparedness. In order to fix this oversight in the high school education system, the system itself must be changed. Through secondary research and interviews with a college advisor and a college freshman, information on the needs of high school students was gathered. The research focused on the differences between the high school and college education as well as common lifestyle changes that college students make. Using the gathered information, it was found that high schools need to implement more challenging class requirements so that students are prepared for the challenges of college courses and avoid remedial classes. These more difficult classes would need to teach students applied learning which is prevalent in college courses. In order to help students prepare for the stresses and responsibilities that higher education brings, high schools should begin giving seniors a year-long 45 minute class that teaches them how to do chores and manage time and stress. With these implementations in high school education, we can create better prepared students and a brighter future for them and our society.

**Poster # 329**

**The Use of Companion Animals as an Alternative or Aid to Medication**

Johnson, Sierra Marie

Companion animals are any domesticated animals that provide benefits beyond utility to humans. Companion animals are already used for many things including guiding the impaired, detecting changes in blood sugar for people with diabetes, and treating PTSD in soldiers when they return from combat. A lot of research has been conducted on training animals for these tasks, but not enough has been done on some of the other medical issues companion animals can help with. While there is research showing various conditions that can be eased or treated by contact with companion animals, more needs to be done on why and how to implement animals into treatment practices. This project examines how companion animals can be used to treat mental and physical ailments in conjunction with or in place of medication. It also delves into some of the negative side effects that common medications have and how using companion animals for therapy can decrease the risks associated with them. Companion animals are a safe, reliable, and relatively affordable treatment option to be used as an alternative or aid to medication in mental illnesses such as anxiety and depression, as well as physical ailments such as high blood pressure and epilepsy.

**Poster # 330**

**The Truth: Why We See Monsters**

Jones, Gavin Walker

Seeing a monster is an odd experience, because science says they do not exist. This project sheds light on the reasons why many people see monsters in modern times. Dissociation from reality is the biggest factor in having an encounter with a cryptid. Other contributing factors are humanity’s lack of a frontier, the prevalence of monsters in entertainment, the
desire for fame, fear of the unknown, and regionalism. Combined, these reasons provide a background for a person with dissociative tendencies to project a monster onto. This project first discusses what dissociative tendencies are, why people with these tendencies are able to see so many different cryptids, and how common the disorder is amongst humans. Next, the essay delves into the background elements that cryptids are made from. An exploration of the ingredients of a missing frontier, humanity’s fear of the unknown, regional patriotism, the prospects of fame, and monsters in the media illuminates how a cryptid is to be “seen.” Finally, a several case studies are discussed. These are the relatively new vampiric beast El Chupacabra, the harbinger Mothman, and the infamous Loch Ness Monster. The goal of project is to expand upon the limited research on monstrous sightings.

Poster # 331

The Role of Age in Briony’s Narrative in Atonement

Jones, Hannah Grace

A Classroom Project for English 298

This paper examines the effect of age and maturity on a person’s perceptions in Ian McEwan’s novel, Atonement. Specifically, Briony Tallis’s actions and views are focused upon since she is thirteen years old but equates herself to the adult characters in the novel. Briony believes herself to be introspective and self-aware throughout the entire story, yet there is a limit to how much a person can truly understand themselves and their own minds. As a result of her flawed understanding of maturity and adult situations, Briony views reality simply as another story, which causes her to ultimately manipulate events to fit her narrative. Some argue that Briony does not significantly change personally as she ages, which implies that age is less relevant to her actions than just her personality itself. However, Briony demonstrates multiple different characteristics as an adult and proves to understand her actions more so than when she was still a child. Such research can impact social understanding of child psychology.

Poster # 332

Cash or Code: Are cryptocurrencies more efficient than conventional cash?

Joshi, Ketaki A

A Classroom Project for English 298

Cryptocurrencies, defined as digital assets designed as a form of exchange have become a recent global phenomenon. They depend on cryptography - technique of writing and solving codes - to secure their transactions, control the creation of additional units called blocks, and confirm their transfer. As developments in cryptocurrency technology increase, and more cryptocurrencies are introduced to the market, there has been much ongoing discourse and research on the merits and demerits of investing in them. However, there has not been much research that covers the advantages of using cryptocurrencies over government backed fiat currencies (government-mandated cash). This project analyzes the decentralized software and anonymous nature of cryptocurrency transactions and their real-world applications in in underdeveloped regions in order to highlight the advantages of using cryptocurrencies over conventional cash. The project also discusses the necessity for laws that need to reviewed and new regulations that need to be created in the light of emergent cryptocurrencies. Cryptocurrencies are a more efficient form of currency as opposed to conventional cash because they are decentralized, have anonymous transactions, and have practical real-world applications. However, there is a need for laws to regulate them in order to make them a feasible monetary option.
Poster # 333
Ramifications of Unpaid Government Internships: A Discussion of How They Promote Elitism and Limit Social Mobility
Judd, Lexie A
A Classroom Project for English 298 Faculty Mentor: Dean, Lance M

The United States of America’s government was structured in order to represent its citizens fairly, but this principle has been called into question as of late for a myriad of reasons. One of the most salient is the fact that the majority of internships available in Washington D.C., that are vital for gaining employment with the U.S. government, are unpaid. Many theories and much evidence suggest that these limited opportunities keep elite and wealthy families well-connected in politics, as students with extensive money and social capital are some of the only people able to afford the cost of them. Investigations have resulted in deeper understandings of how unpaid internships limit social mobility and growth in all career fields, but the government internships available in the U.S. seem to be the unfortunate prime representations of this issue. This research delves deeper into understanding first-hand accounts synthesized with secondary, expert sources on the topic, concluding that unpaid internships greatly limit the types of people who can work in government.

Poster # 334
Facebook’s Battle Against Fake News
Kemp, Mary Adelina
A Classroom Project for English 298 Faculty Mentor: Brouwers, Marcel

This research is to study the connection between fake news, Facebook, and its users. The phenomenon of fake news, defined as misleading or false news, becoming viral affects many individuals whether they use Facebook or not, because similar issues arise in other social media and news platforms. Facebook has been struggling to mitigate the spread of fake news on their platform since 2016, with varying attempts at regulation that did not accomplish their goals. The most recent is the most aggressive, which calls for the purchase of subscription news services that would display content on news feeds. The study analyzes the effectiveness of Facebook’s new tactic, as well as past ones, in hopes of answering what Facebook needs to do in order to effectively put a stop to fake news.

Methods used include analysis of Facebook’s different tactics, analysis of articles regarding the subject and a survey conducted with a focus on Facebook users. It is concluded that the current direction Facebook is going may not be an effective solution; instead, it should be seeking out a solution targeted at the news companies themselves and not the users, who ultimately are victims of groupthink and will always propagate sensational topics. Additionally, Facebook needs to establish what its role is as an online presence, for it currently is poorly executing a balance between a social media and news platform.

Poster # 335
Deforestation: A Far Too Common Practice of Environmental Degradation
Kesterson, Christopher Tanner
A Classroom Project for English 298 Faculty Mentor: Gentry, Elizabeth Leigh

Deforestation, the removal of forest lands, has roots in many different aspects of culture. Examples of this have been observed globally for all of modern history. This practice occurs for several key reasons: agriculture, urbanization, logging,
survival and ineffective policy. The effects of deforestation are also as numerous as the causes. Furthermore, all of the impacts lead to a form of environmental damage. The removal of forest lands leads to soil erosion, decreased carbon sequestration, flooding, habitat, and overall decrease in soil quality. Once transpired, these effects can take years to be resolved, and in some cases they only grow worse. A combination of these different aspects also play a role in climate change. To resolve deforestation, the root causes must be fixed for the most effective results.

Poster # 336

Male Perception of a Father’s Role: English 298 Qualitative Research Project

Kirsch, Evan Stewart

A Classroom Project for English 298 Faculty Mentor: Nicks, Robin Jean Gray

Sons tend to imitate their father’s behaviors and actions, but whether this holds true when the father is absent due to the military is uncertain. To study this further, fathers and sons were selected for a study. Upon examination of previous research, it was discovered that the absence of a father in a child’s life due to the military has a negative effect on the emotional attachment to the father as well as the development of the relationship between them. To further this idea, a sample population size of three male students, all with intentions of joining the military, between the ages of 18-24, who had a father deployed in the military, was interviewed to see how this absence has affected them later in their life. Understanding the perception of a father’s role in a family that these college males have would be beneficial in fully comprehending the long-lasting effect the absence of a father can have in a child’s life, allowing fathers to know what effect their choice to join will have and how the choice to join the military could have a positive impact in their child’s life.

Poster # 337

The Threat of Fake News

Leblanc, Jonathan Lane

A Classroom Project for English 298 Faculty Mentor: Addicott, Randi Marie

The 2016 presidential election had one of the most shocking upsets in a long while, and it left many wondering how Donald Trump won and how Hillary Clinton lost. Although there are many factors in a voter’s decision, a major player was the spreading of fake news through online platforms, mainly Google and Facebook. As fake news undermines the modern democratic system, fake news should be seen as a threat to the United States and its people. Through secondary source research, there is evidence that fake news could have swung the election in Trump’s favor, which could mean that voters were misled. As Facebook and Google failed to handle the spread of false information due to their inadequate policies, much of the blame can and should be placed on them. The United States government should also take steps to punish those who lied to their own citizens and those who helped spread the lies, so that democracy in America can be preserved and protected from future deceptive threats of fake news.

Poster # 338

Video Game Virus: How the Widespread Recreational Phenomenon Has Become a Pandemic of Addiction in Youth

Lee, Mark Alexander

A Classroom Project for English 298 Faculty Mentor: Murphy, Samantha Ann
Over the past few decades video games have become a regular entertainment activity for people young and old alike. Mobile device applications can be played on the go, gaming consoles provide hours of fun in the household, and gaming PCs and laptops are now sold by the millions to expectant customers. But as technology advances and companies perfect the art of making juvenile gamers increasingly addicted, the effects of extensive gaming are becoming more significant and pervasive. The implications of these effects are highly debated, with many supporters touting the benign nature of substantial gaming time. This project analyzes various scientific studies to examine the correlation between video games and academic performance, mental health, physical health, the perpetuation of women stereotypes, and violence, and ultimately determines a negative association between each pair. Then it suggests proactive methods for parents to curb video game addiction in children such as moderation in the form of strict screen time restrictions, calls for video game industries to take accountability for their content, and concludes that more research is needed on this increasingly important issue.

Poster # 339

Does Gendered Language Create Gender Stereotypes?

Leftwich, Olivia Caroline

A Classroom Project for English 298 Faculty Mentor: Dean, Lance M

It has been shown that the two primary components of languages, namely the lexicon and grammatical structures, both can impact the thought processes and perceptions of the people who speak them. Grammatical gender is a construct in many of the world’s languages which forces arbitrary words relating to humans (i.e. tired, short, artist, child) to reflect the gender of the human who is the subject of the phrase. Many languages, including English, do not have high degrees of this forced grammatical gendering, but some examples, like actor/actress and waiter/waitress, still exist. In this study, the effects of the presence or lack of a grammatical gender structure in a language speakers are fluent in are analyzed with reference to qualitative gender stereotypes of speakers. Interviews were conducted in person and by email to gather fluent speakers’ views on day-to-day experiences of gender and language in the countries examined. This study finds that grammatical gender does not have a palpable influence on gender stereotypes and instead finds a correlation between cultural phenomena and attitudes on gender and levels of gender stereotyping in a country, suggesting that grammatical gender structures are less influential than first thought.

Poster # 340

Finding and Defining Happiness: College Students’ Perceptions of Subjective Well-Being

Liang, Hannah Grace

A Classroom Project for English 298 Faculty Mentor: Nicks, Robin Jean Gray

Recently, the importance of raising awareness for mental health and well-being is rising out of the darkness. College students especially can be victimized by poor mental health issues due to high levels of stress and anxiety about college life and their future careers. To combat mental health issues, more studies on happiness and subjective well-being have been conducted in recent years. Although previous research shows that the reasons for well-being vary, this study focuses specifically on college students’ personal motivations for achieving their definition of happiness. It also investigates the factors that come into play, such as personality, wealth, religion, and cultural background. To investigate these varying perspectives and to find a trend among this population, three college students at the University of Tennessee-Knoxville each participated in an interview consisting of questions about their current levels of happiness and what will affect their
happiness in the future. From listening to the participants’ unique experiences and opinions, this study draws conclusions on the major factors that impact a college student’s happiness as well as the motivations for achieving long-term happiness after college. These results could potentially give ideas to the administrators of the University of Tennessee-Knoxville and other universities on how to boost the morale of the student population and assist students in achieving their aspirations and genuine life-satisfaction.

Poster # 341

Technology and Economy: The Correlation that Will Sustain the Economy of Today’s Third World Countries.

Link, Rebecca Anne

A Classroom Project for English 298

This essay seeks to highlight the scholarly argument of how to improve and sustain the economies of today’s third world countries. Suffering from stolen resources, these countries need a way to regain strength internally and become independent of larger nations. This essay concludes first that there is a correlation between growing technology and economic stimulation, and second that this correlation should be applied in developing countries as a possible solution to rebuilding and sustaining their weakened economies. The first claim of the conclusion is drawn by analyzing how today’s super powers, including The United States, Great Britain, and Japan, stimulated their own economies and have continued to sustain them. It is shown that when these countries underwent major industrial and technological revolutions, the economy was boosted through the creation of jobs and an increase in education rates. Furthermore, the solution is justified by studying the effects of government action toward boosting technological advancements in their states and cities. The results in cities, such as New York City, provide evidence that government action in Third World countries would be beneficial in solving the problem at hand. These conclusions will not only shed light upon the importance of technological growth, but also upon the possible benefits this correlation would have in developing countries.

Poster # 342

Public Perspective on Monsanto Genetic Engineering

List, Emily Brianna

A Classroom Project for English 298

As the world’s population grows, food demand increases, but the supply from farms is fairly consistent. Another consequence of population growth is a decreased land allocation towards food production. To combat this, genetically modified seeds (GMS) have entered the market to supply the country with higher yield per acre. However, this is not without cost – a large portion of the community greatly disagrees with genetically modified organisms, and in particular Monsanto, a company that specializes in GMS. The debate gets highly complex when the humanitarian efforts of Monsanto are taken into consideration. Specifically, when the corporation’s harsh business practices, environmental risks, and unlimited resources is worth potentially feeding a larger portion of the world with higher quality food. A student, biologist, and farmer were interviewed on their perspectives in regard to Monsanto in an attempt to get the most accurate representation of the impacted community. Do the long-term risks outweigh the possible long-term benefits of large scale production and consumption of genetically modified foods? All of the interviewees arrived at differing conclusions on what the future of Monsanto should be. Therefore, more research into the public opinion is necessary so effective policy can be made.
Poster # 343

An Exploration of the Benefits of Sustainable Building and Renovation on the University of Tennessee’s Campus in Knoxville

Lloyd, Sarah

A Classroom Project for English 298  Faculty Mentor: Newburn, Harry Fredrick

Humans are living in a time scarcity; reducing construction emissions and the carbon footprint of the building industry is the most effective way guarantee a quality life for future generations. The built environment has damaged the earth while enriching culture, especially on the University of Tennessee’s campus in Knoxville. Several reasonable resolutions exist to combat these impacts, such as renovation and clean building. The operational energy use in buildings could be reduced with energy-positive skins and net-zero innovations. In these designs, buildings make energy in excess off the grid, which can be stored or sold back to the utility. These situations are especially applicable while considering the upgrades at UTK. The current construction’s environmental impact should be reduced by implementing renovation instead. A structure’s value lies in the time it took to design it, along with the materials and stress to the environment that its construction necessitated. These resources should be reused and recycled to every possible degree to save energy and resources.

Poster # 344

Dinosaur Coloration and its Implications on Behavior and Environment

Maddox, Hannah M

A Classroom Project for English 298  Faculty Mentor: Newburn, Harry Fredrick

Our view of dinosaurs has evolved over the last few centuries, and these prehistoric animals have gone from sluggish lizards to feathered and active bird-like creatures. Recently however, we have been able to get even closer to how these animals appeared in real life through unlocking the secrets of fossilized melanosomes. Melanosomes in modern animals are pigmentation cells that give organisms their color, and can be found in skin, fur, and most importantly, feathers. Recent well-preserved fossils from lagerstatten beds that have evidence of feather or skin preservation have been put under the microscope to study their melanosome shape and sizes, and eventually make very close guesses of what the color the animal was in life. We have found color in animals ranging from the small four-winged dromaeosaurid Microraptor, which had iridescent black feathers like that of a raven, and even a giant Ankylosaurus relative was similarly found with a reddish top and a light underbelly. This research helps paleontologists understand everything from lifestyles, display behaviors, and even how much direct sunlight an environment received. Effects such as countershading can also suggest the amount of predation pressures in an ecosystem. Further research into this facet of paleontology can give us a better glimpse into the lives of dinosaurs than we thought possible.

Poster # 345

From the Cradle to College: How Parenting Styles Affect Student Academic Performance

Mahaffey, Evan Paul

A Classroom Project for English 298  Faculty Mentor: Nicks, Robin Jean Gray
Often, students give varying excuses or reasons for their academic performance in school. One monumental factor contributing to this stems from the students’ own homes. The purpose of this study was to identify and understand the relation between parenting styles and student academic performance in school. This newfound knowledge will be used to inform an audience of other researchers, parents, and school faculty among others about the most effective styles of parenting for student academic success. In order to validate these results, students from the University of Tennessee’s Chancellor’s Honors Program were selected and interviewed in order to understand their personal experience regarding their upbringing and how well they did in school. First, the students were asked a series of demographic questions. The students were then asked about their relationships with their parents as well as their specific performance and attitude toward school. Some limitations regarding the study included selecting students from a small pool and receiving weak or thin responses. Despite these possible limitations, the results hope to identify which parenting styles promote the highest and lowest levels of performance.

**Poster # 346**

**Machine Learning and AI in Business**

Mai, Joshua V

A Classroom Project for English 298

Faculty Mentor: Dean, Lance M

With machine learning algorithms and artificial intelligence becoming more advanced, it is being used by more people. One area that seems to be using machine learning technology are businesses. Machine learning enables businesses to see patterns in mass amounts of data. It can also give a better insight to consumer behavior, so businesses could market their product better. In conjunction with secondary source research, I conducted three interviews. Two of the interviews were with professors that specialize in machine learning/AI research and I also interviewed a previous business owner. These interviews provided a deeper insight into my research. Overall, this paper concludes that machine learning and AI technologies will increase businesses efficiency and has the chance to automate many different jobs in the future.

**Poster # 347**

**Working Two Jobs: Challenges in Balancing Engineering and Motherhood**

Maness, Samantha

A Classroom Project for English 298

Faculty Mentor: Dean, Lance M

The “drain” of educated women from leading engineering roles is an ongoing concern in the STEM world, and thus reviewing the causes for such phenomena is crucial not only to pure research but also the advancement of the industrial world. Motherhood is an occupation of millions of women throughout society, but its impact on career trajectory is exceedingly dependent on a woman’s field of employment. While being a mother is a strenuous task for any working individual, often those in technical professions typically considered masculine experience particularly intense changes in their careers after having children. This study relies primarily on interviews of several female engineers who have maintained their professions after having children and is supplemented with relevant secondary sources in order to examine the changes and possible challenges involved in balancing a technical career with raising children, such as alterations in their advancement options or lack of flexibility in work scheduling. These testimonies include women with children of varying ages and demonstrate a general trend towards supporting working mothers that is becoming somewhat more prevalent in the engineering industry today. However, they also highlight ways in which engineering employers should improve in accommodating these employees in order to better retain their knowledge and experience,
such as through alterations in advancement ladders, modified parental leave allowances, and increased on-site accommodations for nursing mothers.

**Poster # 348**

**Political Gaming: Playing Video Games as a Medium for Political Engagement, Learning and Discourse**

Marra, Christian Lee

A Classroom Project for English 298

Faculty Mentor: Gentry, Elizabeth Leigh

Many people tend to consider video games as being purely for entertainment. Contrary to that belief, video games have a wide array of practical application, the focus within this paper being incorporating video games into political engagement. They can achieve this through a variety of different methods, such as historical learning and understand, addressing political issues such as war and diplomacy, and challenging political theories through “thought experiments.” Many other applications can be observed through the engagement games provide through stories, ideals, and internal politics, such as those in Mass Effect. The studies and interpretations within this paper disprove the ideal that games have no practical application by both providing examples of applications of video games within political engagement and mechanisms for making those applications more widespread.

**Poster # 349**

**Culture’s Effect on Biblical Interpretation: Sexuality in the Church**

Maryanski, Austin Connor

A Classroom Project for English 298

Faculty Mentor: Dean, Lance M

The Bible has been interpreted in many ways throughout history, hence the numerous translations and many more interpretations. These interpretations are not created solely out of enjoyment of scholars, but because through time the influence of society and politics create different understandings regarding the Bible and how it should be translated. This research will discuss specifically how the Presbyterian Church (U.S.A.) and their beliefs regarding sexuality in theology have been affected by culture and other outside influences. Through interviews of a PCUSA minister and several religious studies professors at UTK, as well as online research surrounding the history of sexuality in America, this study examines a discussion the meaning of sexuality in theology to the PCUSA and how their interpretation of different biblical texts regarding sexuality over the course of four decades has changed dramatically. These changes, this study argues, reflect cultural beliefs throughout western civilization in the 21st century, demonstrating the notion that the Bible is not a static text.

**Poster # 350**

**The Effects of Parent Dynamics on College Freshman Women**

Mason, Berkley Cave

A Classroom Project for English 298

Faculty Mentor: Nicks, Robin Jean Gray

Research on how women’s roles in society have changed over time is abundant. However, most research focuses on how large movements influenced these changes. There is a lack of research about how college age women start to incorporate
personal information learned about family dynamics into their own choices about what to study, future career paths, and future family goals. This study continues this field of research by interviewing women in the Chancellor’s Honors Program at the University of Tennessee about their childhood household environments and what choices they plan to make in their lives to create their most preferred environment in their own household in the future. This study aims to shine a light on the small details in individual women’s lives that often spark greater societal revolutions that often are the focus of study and research. This research also provides a better understanding about how familial relationships can impact the goals and hopes of women for the future. Women of this age group are diverse in the ideologies they hold, the goals they aim for, and the events they have experienced. The results from investigating how some of these women are dealing with the choices they face can be extrapolated to the group as a whole and be used to improve the ways in which universities or other organizations serve and utilize this group.

**Poster # 351**

**To See or Not to See: The Complications of Racial Colorblindness**

McClain, Claire Elizabeth

A Classroom Project for English 298

Faculty Mentor: McCue, Kristina

Experts in modern genetic research have been unable to locate a gene that specifies race in the human genome. This study focuses on a discussion of the changes in attitudes about race that have occurred recently, which have shown a dramatic increase in the number of people who identify themselves as racially colorblind. Colorblindness is a social practice in which someone claims that they do not identify individual races. This identity has been creating much more division rather than unity, undermining the apparent beneficial effects of non-racial identity. While there is discussion to be had about colorblindness as a practice, the topic of race as an identity should also be discussed before coming to conclusions about colorblindness. Many people to consider their race as a part of who they are because of the practice of using race as a categorization technique. Because more people have begun to consider their race as part of their identity, divisions among races have grown. Of the evidence that has been gathered, the wide consensus among sociologists is that instead of bridging the gap among racial communities, colorblindness creates deeper divides as people begin to ignore the identity and culture of vulnerable groups. Clearly this shows that although the theory and social practice of colorblindness may be motivated by altruism, the outcome leads to more division among races which can, in turn, lead to unrest. Sociological research into this topic is important because it could lead to a greater understanding of racial identity. Because we now have information on the damage caused by not validating race, future research should focus on understanding the origins of this identity and how it came to be as widespread as it is.

**Poster # 352**

**Benefits of Implementing Therapy Dogs into Collegiate Sports**

Mccusker, Olivia Caitlin

A Classroom Project for English 298

Faculty Mentor: Newburn, Harry Fredrick

This paper discusses the current settings for therapy dogs, mental health issues of college athletes, and the possible effects of implementing therapy dogs into collegiate sport environment. The use of therapy dogs in several settings is a burgeoning field. Often therapy dogs are used to help reduce stress, and they can be seen in a variety of locations including hospitals, cancer wards, and college campuses. The use of therapy dogs in counseling is also viewed positively, and many mental health professionals stated that therapy dogs would be great in situations where someone is suffering from anxiety
and depression. Another aspect of this paper is exploring the mental health issues that student-athletes face. These issues include stress, anxiety, depression, and eating disorders. An additional problem student-athletes face is physical rehabilitation and the numerous challenges that come with it. Research included several studies, articles, and interviews with people in the fields examined. The integration of therapy dogs into collegiate sport settings could provide student-athletes with a new resource to deal with mental health issues and difficulties of rehabilitation after injury. Future research would be assessing the cost-benefit analysis of such programs.

Poster # 353

Why People Believe That Vaccines and Autism Spectrum Disorder Are Linked: A Qualitative Study

Mcdonald, Delaina Kay

A Classroom Project for English 298

Faculty Mentor: Brouwers, Marcel

With an increasing number of people diagnosed with autism spectrum disorder (ASD) and an increase in vaccinations given to children, skepticism about the link between the two is on the rise. Many people insist that a link between vaccinations and autism spectrum disorder exist; however, several reliable establishments – The Center for Disease Control and Prevention, the Institute of Medicine, The American Pediatrics Association, and several more – claim otherwise. So why do people still believe that there is a connection? By surveying numerous individuals of various backgrounds and opinions, it can be concluded that a significant portion of people who believe that there is a link between vaccines and autism most likely have a family member with the disorder and are looking for a reason beyond chance.

Poster # 354

The Road to Sustainable Cities: Eliminating Cars

Mcginnity, Kevin Michael

A Classroom Project for English 298

Faculty Mentor: Dean, Lance M

Cities, already well-established contributors to climate change, will continue to grow, causing the need for substantial change to the unsustainable practices that make cities so environmentally hostile. Converting cities to become greener is challenging, as fundamentally changing the current means of operating requires major change to people’s lives. This research paper explores the aspect of transportation in cities, determining how feasible virtually eliminating personal automobiles from cities would be. Three experts in city planning and engineering were interviewed, and each expert mentioned autonomous vehicles and densification of cities, making these aspects a large focus. Autonomous vehicles are expected to come to cities in the next decade, which could revolutionize travel and possibly make vehicle ownership obsolete. There are social stigmas associated with trying to eliminate personal transportation, but altering city layouts and creative mass transportation might spur a travel revolution. Many cities have already began densifying, usually to combat sprawl but this could also make active transportation more popular. Making cities more compact requires gentrification and social flexibility, however, a smaller city may incentivize greener ways to move around. This study finds that eliminating cars from cities is a practical possibility for the future.
Poster # 355

Missed Opportunities in ROTC

Mcknight, Maddox Deon

A Classroom Project for English 298

Faculty Mentor: Barrow, Robin

For decades, the Reserve Officer Training Corps has been the leading developer of officers in the Air Force and Army. All around the nation, these different programs are developing their cadets with the same standards and practices. With only a few differences between Air Force and Army ROTC, there are many neglected benefits to keeping these detachments and battalions separated. As a member of AFROTC here at Knoxville, I can’t help but wonder what kind of advantages these groups would have if they collaborated more. I began my investigation by interviewing an Air force ROTC member who has been in the program for a while and has different experiences then me and an Army ROTC member who also has been in the system for a couple of years. I then compared these interviews to experiences from online accounts from other ROTC members. From the stories, I pinpoint areas in which these to programs can benefit from each other mutually. Using information online, I solidify my argument using articles on Air Force and Army collaborations and relating it to ROTC structure. After looking into the similarities between these programs, the potential benefits of our communities working together are endless.

Poster # 356

The Cause and Consequences of Fake News and North Korea: A Qualitative Study

Mcswain, Charles Miller

A Classroom Project for English 298

Faculty Mentor: Brouwers, Marcel

This study compares survey data to media and scholarly sources to determine if news media is the primary cause of misinformation about North Korean nuclear weapons. The correlation of public belief versus factual knowledge on this particular subject is important because if truth and knowledge do not lead to the same general conclusion, then lives could be at risk. The correlation is determined by evaluating public opinion, collected through survey, and comparing those beliefs to scientific data and observations recorded in academic journals. Survey participants claimed their beliefs spawn from the information presented from news networks; however, after analyzing the networks’ descriptions of North Korea’s weapons program, it has been determined that news reports are typically correct while the participants’ answers were mostly wrong. The mapping of public belief versus legitimate knowledge helps to determine where misinformation is being spread from and proves that fake news is affecting the public in a significant way that could cause many issues like global panic or war.

Poster # 357

Fake News and War

Meidl, Timothy Christopher

A Classroom Project for English 298

Faculty Mentor: Brouwers, Marcel

Fake news has been a tool to perpetuate hate and fear of foreigners for hundreds of years, and is still used today. This historical paper explores the use of fake news by the American populous during the Spanish American War, the United States government’s dispersion of fake news during Vietnam, and modern-day examples of Trump’s commentary on the
United States Navy and North Korea so that citizens can be wary of scandalous news and question the validity of their news sources. This historical research is coupled with current surveys on how people think the government should act, which provides real world data on an incredibly complex issue. The survey was distributed through the internet, available to anyone in the world through Reddit. It was revealed through the survey that many Americans believe in principle that the government has the right to defend its people by any means necessary, but almost 100 percent of those surveyed disagreed with historical examples of fake news justifying war. It is the duty of all American people to know the truth regarding global relations with the United States so that society can prevent needless bloodshed and hate solely because a government or people group releases lies to achieve a personal agenda.

Poster # 358

Children and Immigration: The Psychological Effect of Multiple Cultures on Identity

Mendoza, Cassandra J

A Classroom Project for English 298 Faculty Mentor: McCue, Kristina

Understanding the psychological effects on children of cultural transmission via familial immigration can provide insight into the development of human self-identity. Insight into possible methods of effective young immigrant education is also applicable, given the struggles of youth to merge education in a new culture with a home life that may retain exclusives or impart the culture of origin. Previous research on this topic has been conducted in the form of observational studies, interviews with immigrants, and questionnaires. Children coming to terms with identity formation, struggling for success in the academic world, and seeking a healthy relationship with parental figures are concluded effects of early immigration discussed in this paper. The primary method of assisting young migrant children in the classroom was found to be through application of various forms of communication, such as drawing instead of verbal communication. There is also a positive link established between social environment and formation of identity, considering the first-hand accounts of young immigrants indicating context-dependent fluidity between two identities. Further research into the integration of culture and immigration, along with any joint effects they may have on human development, can aid those with particular interest in psychology as well as child and family studies. Deeper understanding of societal assimilation and how young family members manage social transition can also be attained, with detailed study into the effects of pressure to preserve immigrant families’ original culture.

Poster # 359

Integrating the Mind-Body Relationship into the Medical Field: The Effect of Practicing Yoga and Mindfulness for Cancer Patients

Miller, Kayla Morgan

A Classroom Project for English 298 Faculty Mentor: Gentry, Elizabeth Leigh

The antiquated model of illness that seeks to explain all illness in biological terms is insufficient as a basis for cancer treatment plans and does not acknowledge the powerful psychological aspects that affect health, specifically mental health. Evidence exists about the mind-body connection and its ability to enhance a cancer patient’s treatment plan and quality of life through the integration of mind-body techniques, particularly the practice of yoga and mindfulness. This paper examines multiple studies focusing on the existence of the mind-body connection, health psychology, and psychoneuroimmunology. This paper synthesizes the studies to offer potential additions to treatment plans, specifically for cancer patients, by (a) defining the biopsychosocial model in the context of current day medicine, (b) examining bodily
responses to stress to find techniques to counter the reactions, and (c) concluding that mind-body techniques work to achieve the highest quality of life for patients. Although these additions may raise the cost of treatment, the mind-body techniques should be implemented in cancer patients’ treatment plans for a more effective healing process.

Poster # 360
The Truth about Influenza Shots: Should Parents Have Their Children Vaccinated?
Millett, Bailey E.
A Classroom Project for English 298
Faculty Mentor: Addicott, Randi Marie

Is it dangerous for children to receive influenza vaccinations? Are flu shots actually beneficial to the health of children? Although public perception views vaccinations favorably, several myths still linger leaving parents in utter distress. These fears are the consequence of an overall lack of understanding about these vaccinations. The influenza virus impacts children’s health, education, and home life. By recognizing the virus’s harmful effect, the true purpose of the flu shot can be understood. Parents should, in fact, have their children vaccinated because this simple preventive measure can save lives and inhibit the continuous cycle of this deadly virus. Kids are highly susceptible to catching the flu in the close proximity of the public school system, and an annual flu shot allows schools to remain a safe place for youth. Pediatric healthcare providers strive to ensure that all children remain healthy; and parents should therefore trust their expertise. Exploring the progression of flu myths and the control that the influenza virus has on society, parents can see the value of vaccinating their children.

Poster # 361
Making Therapy Better - Virtually: Integrating New Technology to Improve Old Techniques
Mobbs, Courtney C
A Classroom Project for English 298
Faculty Mentor: Newburn, Harry Fredrick

Physical therapy is a common need among all groups of people. There are certain aspects of physical therapy, such as some of the traditional exercises, that have stayed the same over the years, but improvements in technology have also allowed practices to evolve. In recent years, physical therapy treatments have been made more efficient by using virtual reality technology. In conventional therapy, clinicians lack ways to motivate patients and keep them accountable for performing their exercises. There are several types of virtual reality that can solve these issues by tracking a patient’s motion or creating environments that stimulate their interest. In this way, virtual reality motivates patients to perform their exercises more frequently, resulting in higher success rates following therapy. Patients and therapists should not be skeptical of this technology, but instead, be willing to implement these helpful programs into their practice. By doing so, therapists will not only have more free time, but will be able to provide patients with a more individualized treatment.

Poster # 362
The Benefits of Anti-Racist Activism on Society
Monarrez, Jesus Noe
A Classroom Project for English 298
Faculty Mentor: Addicott, Randi Marie
Using a critical sociological lens to understand the rise of white supremacy and the establishment of institutionalized and systemic racism in the United States, this essay focuses on the beginnings of white supremacy and its effects on society. First, the concept of white ignorance and white-washing are discussed in an effort to educate readers on how institutionalized racism has subtly affected individuals’ lives. Additionally, racial trauma and underrepresentation is explored to begin directing abstract concepts into concrete problems that can be resolved. Next, racial grammar and racial microaggressions are examined to illustrate how systemic racism has pervaded daily actions and the common vocabulary of society. Finally, by forming a foundation to understand how institutionalized power structures have been created and analyzing their impacts on society, the concept of activism is considered. By focusing on the younger generation’s impact through youth activism and how it benefits everyone in society, the argument to support youth activists is strengthened.

**Poster # 363**

**A Major Decision: Influences on Freshman Engineering Students**

Montgomery, Matthew G

A Classroom Project for English 298

Faculty Mentor: Nicks, Robin Jean Gray

While much research has been conducted to better understand the choices made by college students when choosing a major, new insights may be attained by examining how parental influence affects the specific population of first-year engineering majors. This study used qualitative research methods to investigate the factors which influence first-year engineering majors at the University of Tennessee Knoxville (UTK) to choose their college major. Interviews were conducted with three first-year students and analyzed to assess how parental obligations interact with and compare to other influential factors. By examining the role that parental obligations play in influencing students to choose a college major, a more comprehensive knowledge of the social underpinnings of this decision may be established; moreover, support may be provided for those who are facing college-related social pressures and interactions may be encouraged that are beneficial both for the student and for society as a whole.

**Poster # 364**

**Spooky Science: Honors Students’ Perception of Genetically Modified Organisms**

Moran, James Michael

A Classroom Project for English 298

Faculty Mentor: Nicks, Robin Jean Gray

College students, having been exposed to a stream of contradictory information through social media, have varying opinions on food ethics, the farming industry, and genetic modification. This study uses three interviews selected from a population of honors students at the University of Tennessee in order to gather qualitative data regarding college students’ attitudes toward and knowledge of genetically modified foods. The research provides interesting insight into how information and media coverage skew dietary practices of college students.

**Poster # 365**

**The CPA in a Changing World**

Morris, Nicholas Taylor

A Classroom Project for English 298

Faculty Mentor: Dean, Lance M
The accounting career is one of the most fulfilling areas in the business world. Successful accountants need to take the CPA Exam in order to advance further in their careers. Over the years, the CPA Exam has evolved in order to address the needs of the accounting world at the time. In 2017, the AICPA introduced changes to the CPA Exam as it focuses on critical-thinking skills and hypothetical questions in order to prepare young accountants for their future careers. At the same time, technology has improved and changed the outlook of businesses throughout the world. With the technological advances in society, the accounting field has been forced to evolve and introduce new technology into its accounting practices. An accountant’s ability to embrace the change will determine his or her chances of ensuring success individually and for the company. With the use of secondary sources and personal interviews, I conclude that these changes will affect the incoming group of young accountants, determining what skills and qualities are needed for future success in the growing accounting world.

Poster # 366

Fake News Within the Flat Earth Society’s Public Rhetoric

Morrow, Josephine Whitten

A Classroom Project for English 298

Faculty Mentor: Brouwers, Marcel

The resurgence of the Flat Earth movement has puzzled and worried many individuals who share the widely accepted viewpoint of a globular Earth. Specifically, the Flat Earth Society has purposely falsified information with the intent to deceive readers into supporting their ideals and theories. These efforts have been met with success on many more occasions than the average individual may expect. This renewed debate in the scientific community prompts questions such as: What sparked the Flat Earth Theory’s reappearance? Does this resurgence have any correlation with the public’s current focus on ‘Fake News’ and the corresponding skepticism of information from mainstream media? Does fake news have enough pull with the public’s perception to influence even accepted truths such as a globular Earth? Furthermore, what, if anything, do the Flat Earthers expect to accomplish through the spreading of their false ideals?

In an effort to determine what the common perception of conspiracy theorists are, the researcher made a survey which was then made public via a Reddit thread. Comprehensive background knowledge was gained over this issue, through research of both common and academic sources. Both of these information outlets will be taken into account when concluding the final findings.

Poster # 367

Future Impacts on Privacy due to the Increasing Use of Social Media by Society and Government Use of Artificial Intelligence

Morton, James Tyler

A Classroom Project for English 298

Faculty Mentor: Addicott, Randi Marie

This essay examines how the growing use of social media combined with the potential of future artificial intelligence technology could allow governments to conduct surveillance on society that would essentially eliminate privacy. Right now, the use of mass surveillance is very effective but has its flaws. Current technology limits the power of mass surveillance to a degree; however, there exists a growing problem with governments intruding on law abiding peoples’ privacy. This intrusion causes debate, because mass surveillance can help in police work and national security, but the flaws dampen the benefits. Privacy is a human right and when it is taken away it can have significant effects on human
behavior. If mankind is not careful, privacy will become a thing of the past and governments will have more control over the people than imaginable.

**Poster # 368**

**Advancements, Effects, and the Importance of Hydrocephalus Procedures**

Morton-Killeffer, Morgan Elizabeth

A Classroom Project for English 298  
Faculty Mentor: Dean, Lance M

Hydrocephalus is a brain condition that occurs when cerebrospinal fluid (CSF) can't drain from the brain. It then pools, causing a buildup of fluid in the skull. The most common form of treatment is the use of a shunt to drain fluid from the brain, but they have a low success rate and often end in multiple invasive procedures. Little to no improvements have been made to the original shunt and research seems to be at a standstill. Improvements and further research in hydrocephalus procedures is critical to survival and the wellbeing of those affected. This research paper, using secondary research as well as interviews, works to educate readers on hydrocephalus and argues the importance of further research regarding decreasing the invasiveness of the procedure and the importance of finding a cure for the disease.

**Poster # 369**

**Genetic Modification and Consequential Ethical Implications**

Moss, Jared Grayson

A Classroom Project for English 298  
Faculty Mentor: Newburn, Harry Fredrick

The medical field is currently advancing at an unprecedented pace, with arguably the most influential medical breakthrough in history on the brink of clinical implementation. This turning point technology, known as genetic modification or gene therapy, has the potential to edit the genomic code by means of proteins such as CRISPR. This editing capability allows for mutated segments of the genome to be replaced by normally coded template DNA, with the implications of preventing isolated genetic disorders such as Cystic Fibrosis and Tay-Sachs Disease. However, gene editing technology is still in a developmental phase, as off-target edits are still a reoccurring problem in laboratory tests. As this technology becomes safer and refined, dialogue regarding its regulation, affordability, and ethicality will be crucial in assuring that gene editing makes a smooth transition from the research sphere to clinical implementation. Furthermore, if or when gene editing attains its grandiose disease preventing potential, the researchers responsible for these breakthroughs must avoid commercialization and patenting of the technology to maintain its accessibility both by universal availability and affordability. With CRISPR already showing incredible progress in the lab, we as humans are one step closer to the eradication of genetic disorders.

**Poster # 370**

**Live Organ Donation Compensation**

Myers, Addison Kay

A Classroom Project for English 298  
Faculty Mentor: Barrow, Robin

Compensation for live organ donation is a heated subject within the United States and around the world. Donating
an organ is a charitable act in which the surgery is usually paid for, but many Americans cannot afford the remaining post-op care without dipping severely into their bank account and facing negative financial repercussions. There are many questions regarding the ethics of either paying or not paying a donator for their organ. Would payment ensure more safe donations occur and decrease unsafe black-market “donations”? Is offering compensation going to encourage a significant number of donors to come forward? My investigation into this issue will attempt to outline the advantages and disadvantages of each side of the debate. I will collect and synthesize multiple sources in order to provide truth from a bioethical standpoint about how compensation for live organ donation affects the lives of donors and recipients.

Poster # 371

Thomas Jefferson’s Descendants: Genetic Analysis and Family Experience

Natale, Alexandra Elyse

A Classroom Project for English 298 Faculty Mentor: McCue, Kristina

The claim that Thomas Jefferson fathered children with Sally Hemings, Jefferson’s slave until his death in 1826, was speculated during his first term as president and has remained a subject of discussion and disagreement for two centuries. Eugene A. Foster’s (1998) genetic study found that the Thomas Jefferson Y chromosome haplotype matched that of a descendant of Hemings’ youngest child but not that of the descendants of her eldest son, Thomas Woodson. For 200 years, a divide has existed between Thomas Jefferson’s proven and speculated descendants. Interviews of descendants of Jefferson and Hemings were examined to determine the psychological effects that the genetic study and distorted family history has had on current family members, even 200 years after Jefferson’s life. The main issue that divides the two families is denial regarding Jefferson’s sexual relationship with Sally, which has been spread by the descendants of Martha Jefferson, Thomas Jefferson’s wife. Those directly related to Hemings are psychologically divided by the fear that the other side of the family will not accept them and that even their friends will be skeptical of their claim of being related to Thomas Jefferson. Foster’s study and the resulting interviews and analysis show how genetic studies and distorted family history can psychologically affect those involved, especially when race is a factor.

Poster # 372

Ecofeminism in the Raw Materials Industry: The Impact of Gender and Organizational Culture on the Environment

Nix, Jarred A

A Classroom Project for English 298 Faculty Mentor: Murphy, Samantha Ann

As climate change has become more recognized amid the degradation of the environment, scientists have researched relentlessly to combat the release of adverse emissions and the destruction of delicate ecosystems. However, without limiting levels of production, they have been unable to slow, let alone heal the deterioration of the natural world. In response, many conservationists have begun examining unconventional strategies to alter people’s perspectives on the importance of environmental sustainability. Principal among these has been the theory of ecofeminism, which links increases in gender equality to improvements in environmental treatment. This study analyzes the impact of ecofeminist solutions on the sustainable practices of extraction companies, such as those of logging and mining, based on the correlation between the mentalities and actions of employees. The implications of workplace gender equality hypothesized by ecofeminist theory are indicated by the evaluation of surveys measuring the impact of organizational culture on the environmental activism and beliefs of personnel over time. The correlation between environmental
consciousness and the mindsets of employees with regards to gender demonstrates how changes in company values are crucial to the implementation of sustainable processes in the raw materials industry.

Poster # 373

Genome Editing Technologies: The Ethics of Embryo Testing and Clinical Trials

Noe, Kimberly Nicole
A Classroom Project for English 298 Faculty Mentor: McCue, Kristina

One of the most popular and advanced systems in biotechnology is Clustered Regularly Interspaced Short Palindromic Repeats, or CRISPR; however, the ability CRISPR holds to edit genomes within DNA to cure genetic diseases and then save millions of lives is not without its complications. The case studies developed, as well as contracts changing among regions, have pushed a time constraint to fit the process of embryo testing and human trials. As technology advances and public opinion changes, the need for ethics in testing, increases to cover new ethical problems in addition to the problem of future clinical trials resulting in the construction of laws and contracts between and within countries across the globe. Current case studies and their effects on laws creates issues of ethical testing and possible misuse to be solved within a short times frame. Before considering the misuse of genome editing technology, decisions about the ethical treatment of embryos must be determined. Beyond the testing, there remains multiple social issues to consider; through the advancement of CRISPR millions of lives could be improved or even saved through clinical trials and integration of genome editing into society. CRISPR testing on embryos allows the advancements needed to enter into clinical trials, while creating ethical contracts avoids the issue of cloning and cosmetic changes.

Poster # 374

Reviving Native Culture: The Surge of Cultural Identity in the Postcolonial Belgian Congo

Noll, Jacqueline A
A Classroom Project for English 298 Faculty Mentor: McCue, Kristina

The history of Belgian colonialism in the African Congo poses the question of how much influence the European nation has had on the culture of the Congolese. Research has investigated the history of Belgian brutality and control and the subsequent establishment of Congolese independence, concluding that Western intervention has ruined culture—the rituals, beliefs, and systems that connect a group of people. Through studying the Belgian Congo and its current state in the field of history, it can be seen that among the negative effects of colonial occupation on Congolese native culture have been a violent society, a Westernized education system, unstable national institutions, a loss of authentic meaning of artifacts, and a loss of philosophical and religious identity. Yet, it has been found that although colonization of the Congo has led to deficiencies in the nation and its culture, there has also been a surge in interest in cultural identity and value of native Congolese culture seen in efforts put into building museums and defining new cultural education systems. The negative results on culture also produced positive harmony between African nations in establishing a unified African culture and prevalence in the world, which in no way justifies colonialism or the Westernization of other African nations but instead emphasizes the oscillating role of Western intervention on African nations. As we further investigate the history of colonialism in Africa, we can now focus our attention more on the ways in which Western nations can still offer aid in African nations while also allowing for cultural individuality in each of the nations. Thus, more research can connect this to how the rest of the world can support these nations in strengthening Pan Africanism.
### Poster # 375

**Putting Truth into Perspective: A Look into Perspective Truth and the Outcome of Racism in America**

Norris, William Britton

A Classroom Project for English 298

Faculty Mentor: Addicott, Randi Marie

The evil of racism and racial bias has plagued American culture since the founding of Jamestown in 1607. Naturally, the American nation, built on the backs of African slaves, is ridden with examples of systemic and institutional racism, as well as racism passed from generation to generation. The aim of this research was to identify common examples of institutional racism in America, how their power impacts people in their ethics and morals, as well as to get to the bottom of the spread of racism from generation to generation from a philosophical perspective. Children do, in fact, develop racial bias far before adolescence. This can be connected to the power of society and parental guidance on children, linking the connection between early establishment of racial bias to societal institutions and systems, and well as generational racism being bestowed at a young age. This implies that systems in our society, even to this day, sparks the flame of racial bias among new generations, and that changes must be made to the systems of our society to prevent this disease from spreading.

### Poster # 376

**The way things are: Student perceptions of racial biases**

Nuthalapaty, David Chiranjeevi

A Classroom Project for English 298

Faculty Mentor: Nicks, Robin Jean Gray

Though racism is publicly looked down upon, it still exists and controls people’s thoughts to this day. Racially based stereotypes are prevalent throughout modern education on all levels. This study is based off of interviews from engineering students in the Engage Living and Learning Community of University of Tennessee, Knoxville. This will shed light on how college engineering students perceive racial stereotypes and how they feel it applies to themselves.

### Poster # 377

**Fighting Addiction: How Medical Marijuana Can Stem Opioid Dependence and Help Patients Cope with Chronic Illnesses**

Oberholtzer, Robert Drake

A Classroom Project for English 298

Faculty Mentor: Murphy, Samantha Ann

The legality of marijuana in the United States has been a contested issue since the Marijuana Tax Act of 1937, which rendered the possession and sale of marijuana illegal unless a tax was paid. During the counter-culture movement of the 1960s the popularity of marijuana increased, as it was a part of the experimentation that embodied the American counter-culture movement. After securing mainstream exposure, marijuana advocacy began to build. Since then, public support for the federal legalization of Marijuana has risen to 64% according to the latest Gallup poll. Yet, the United States government still maintains marijuana’s status as a schedule I controlled substance, aligning it with the likes of cocaine and heroin. As the public becomes more aware that their government has incorrectly categorized marijuana, the majority are pressuring their representatives for legalization. This project considers the potential of medical marijuana to be used as a substitute to addictive painkillers, as well as helping patients cope with the immense pain that often comes with chronic...
illnesses. Legalizing medical marijuana could help the United States’ addiction to prescription painkillers, thereby improving the health of its citizens and reducing the amount of lives lost due to dangerous opioid therapies.

Poster # 378
Effects of parental instability and mental illness on children during their formative years
O'Brien, Shawn Michael
A Classroom Project for English 298 Faculty Mentor: McCue, Kristina

The role of the parent during the first years of a child are undoubtably important, as the child learns the nature of the world through the lens of their parents. Maternal depression, strict discipline and excessive or violent conflict between parents has been found to expedite problems such as depression or delinquent behavior in children. Some parents might assume their children’s psychological troubles are due solely on genetics, but many scholars dispute this view, saying that we can look towards the household environment for a more accurate source of personality traits. Simply put, because imitation is considered to be the source of early childhood development, like walking, talking, and bathroom training, poor parental behavior can change a child’s life as they replicate parental deficiencies (Clay and Tennie, 2018). Academics disagree on how to handle this situation: some, such as Kim, Esther, Barajas-Gonzalez, Huang, and Brotman (2018), point to using authoritative methods to offset poor behavior, while others say that this causes other negative behavior aimed at the child’s peers rather than parents. Others like Lansford, Godwin, Al-Hassan, Bacchini, and Bornstein (2018) argue that it is more important to put aside personal beliefs on right and wrong, and base punishment on what is viewed as poor in society. Many are still unsure where to take the research from here, as studying children indepth from childhood to late adulthood takes time, and it is unsure of the lasting effects of modern day parental strategies will have on the children.

Poster # 379
Potential Areas of Improvement in Anaerobic Digestion
Pan, Jason
A Classroom Project for English 298 Faculty Mentor: Dean, Lance M

Global population has been increasing, and due to the increasing population, an increasing buildup of waste and energy consumption has been creating a growing problem. Anaerobic digesters are a suggested solution to the problem; they are machines that house the anaerobic digestion process, which is a series of biological processes in which microorganisms break down biodegradable material in the absence of oxygen. The main product of the process is methane, which is combusted to generate electricity and heat, or, it can be processed into renewable natural gas and transportation fuels. Thus, the focus of the research is to define testable factors that increases the efficiency of the biological process for future experimentation. To define these factors, data was extracted from different websites, articles, and experts’ interviews. The factors determined to increase anaerobic digestion efficiency included increasing temperature, pre-treatment of waste, maintenance of balance in the environment, types of digesters, and pre-analysis of composition.

Poster # 380
Improvement in Drug Education Programs: Assessing Effectiveness
Patel, Akaash
Over the past few decades, drug abuse has seen a steep increase, especially on college campuses, with little to no effective ways to slow it down. Drug education programs have provided a free, easy way for abusers to learn the dangers of drugs and the effects of them on the users’ bodies; however, especially at the University of Tennessee at Knoxville, drug education programs have been inefficient due to the fact that students are inattentive, there is a lack of intriguing course material, and most attendees are required to go as a result of misconduct. Most theories suggest increasing interaction and peer intervention to improve these programs. So how can UT improve its drug education programs? In this study, I specifically examine the University of Tennessee’s program, along with further research on effectiveness of drug programs around the nation to maximize efficiency in future drug programs on college campuses. The results show that the use of trained counselors or trusted elders as leaders, the reduction of class sizes, and the implementation of interactive, activity-based education boosts the efficiency of drug education programs, and that these factors should be highly considered when planning a drug education program.

Poster # 381

General Artificial Intelligence and Machine Ethics
Patel, Ankush V

Recent developments in technology and information databases have allowed society to construct more powerful artificial intelligence (AI). Currently, narrow AI such as autonomous vehicles and individualized ads proliferate society. However, the desire for more general AI systems capable of performing delicate surgeries or participating in search-and-rescue missions is rising. Since general AI will be required to make many different ethical decisions, it would be in society’s best interest to begin developing ethical systems that reflect human values. To determine such a system, qualitative data in the form of interviews was collected from well established researchers in the field of AI. This data suggested that since ethical decisions can be complex and come under a variety of forms, it would be near impossible and inefficient to program all possible ethical decisions - this would require the AI to make its own decisions. However, general AI could make decisions that conflict with human goals; therefore, it is imperative that an ethics system with a core set of human values is implemented within a general AI, which the AI could then use to generate further ethical decisions.

Poster # 382

Fake News Surrounding Murders and Mass Shootings Abstract
Patel, Deneil

Murder and mass shootings are a serious issue in this country, yet the exploitations of these issues are almost as horrendous. People often use fake news, in a political context, to warp details of these instances to mislead the public. The public itself uses fake news every day in a broader sense around the nation, however, when it used to twist details regarding serious issues like murders and mass shootings, it becomes another issue altogether. Should fake news surrounding murders and mass shootings be treated differently than other fake news stories surrounding not as serious issues, such as celebrities, sports, or climate change, for example? This paper delves deeper into instances of these fake news stories surrounding murders and mass shootings in a political context and combines them with current surveys asked to the public to address this question and the issues associated with it. After sending the survey out on reddit to
participants who lived in the US, the trends from the results found that people who affiliated themselves with republicans were more likely to believe fake news articles that were derogatory towards democrat figures, whereas people who affiliated themselves with democrats were more likely to believe fake news articles that were derogatory towards republican figures. However, regardless of affiliation or the fake news article they were more likely to believe, the vast majority of the people viewed fake news articles surrounding mass murders and shootings as a much more serious matter than fake news articles surrounding other issues like celebrity mishaps.

**Poster # 383**

**Effect of Technology on Research Efficacy**

Patterson, Avery Arden

A Classroom Project for English 298 Faculty Mentor: Addicott, Randi Marie

Evaluating the overall usefulness of technology within research has indicated that while at times technology has a less potent effect than intended, it most often drives the productivity of research and fosters limitless potential for advancement. Modern technology, by contributing to public knowledge and propelling innovation, helps researchers increase convenience of daily living and save lives. Thus technology is notably useful to those conducting research. Even research that is not bound by a strictly scientific concentration is often catalyzed, expedited, and improved by various types of technology. In fact, there is a cyclical relationship between technology and research. Research breakthroughs often occur to the credit of the technology used in the discovery process. Meanwhile, as more technology develops, it is implemented into commonplace research practices. Research in turn regularly produces new technologies, and the cycle continues. However, technology is fallible. At times it fails to produce the intended benefit to research results. Investigation of the overall relationship between technology and research, including analysis of their direct impacts on one another, has shown that, overall, technology is a boon to research because of the way it increases its effectiveness.

**Poster # 384**

**The Electric Future**

Patton, Tessa Mathur

A Classroom Project for English 298 Faculty Mentor: Addicott, Randi Marie

Although electric vehicles have the capacity to reduce greenhouse gas emissions on the road, other technological advancements must be made before the reduced net carbon emissions are worth the costs to the average consumer. Plug-in electric vehicles are a step in the right direction, but without further development and better infrastructure, they will not be enough to combat the global issue of carbon emissions from transportation. The major factors that influence demand and effectiveness for electric vehicles are the use of coal-generated electricity, technological standards, reliability, and cost. Overall, the most important of these are reliability and cost; while plug-in electric vehicles are not yet as “clean” as they could be, they are still better for the environment that fossil-fueled cars, which are in higher demand due to price and consistency. Therefore, electric vehicles must be redesigned to better compete with fossil-fueled cars.
Cryptocurrencies are a topic of debate in the economic and financial world, but they are a technology that could further change the fast-evolving world of payment methods. Bitcoin, the most developed and mature cryptocurrency available as of early 2018, has the potential to ease its way into markets of struggle or markets of currency failure such as the Zimbabwe currency crash of 2009. Unfortunately, Bitcoin has found, and continues to find, struggles with price fluctuations and immaturity of security. Input from a central bank executive and a leading theoretical researcher of cryptocurrencies suggest that these problems need to be fixed to allow Bitcoin to have a realistic chance in a market. Trust of citizens is the most important factor in any currency, as it determines the legitimate value of the currency, which is where the suggestion of central bank cryptocurrencies comes into the discussion. Having a cryptocurrency that is backed by the government of a nation allows for that cryptocurrency’s value to be tied to a real currency like the United States Dollar. In this regard, there are technologies like Venmo or Sweden’s Swish that challenge cryptocurrencies as competition. Cryptocurrencies, however, behave more like cash than these payment methods, so having the option of anonymity and potentially higher security makes a big case for central bank cryptocurrencies.

Artificial Intelligence is becoming a more prevalent topic of conversation in today’s table chatter, but it is still growing as a topic that people have strong, widespread opinions on due to recent breakthroughs in technology and neural networking. The following research will help to illuminate the public conceptions of artificial intelligence, and how well people will accept it upon its introduction into society. Through a series of four interviews on students in the honors college, information was collected on the state of artificial intelligence through the eyes of the public, and what they perceived an advanced form to be. Through the interviews, a paper was able to be compiled detailing the connotation revolving around artificial intelligence. Through this, scientists and developers will have a better idea of how to introduce advances in artificial intelligence to the world, through either being more cautious and gearing it to seem helpful and benevolent, or spending more time on developing it to suit our needs without having to worry about the mentality of consumers.

People have investigated gender differences for centuries. Ideas and theories have been formulated regarding why there seems to be such a large gap in how men and women perceive each other and communicate. This not only affects personal
relationships, in friend groups and/or romantic instances, but even more in the workplace. The division can cause major problems for companies as more women join the workforce and take managerial positions. As this happens, employees and employers may find it increasingly difficult at times to clearly communicate their points to co-workers of other genders. Is this an ever-growing problem that needs to be fixed by cutting out these differences? Or could it be that we must just acknowledge these differences and learn to work around them? This paper discusses the gender differences that have been found, how they affect communication, and whether this is a problem and how to approach the problem. A focus of this paper is how students in the Chancellor’s Honors Program LLC at the University of Tennessee view this topic and problem. Understanding these disparities is key if we wish to exchange our thoughts and ideas clearly, which can lead to healthier co-gender environments.

Poster # 388

The Chase for a Cure: Alternate Treatments to Neurodegenerative Diseases

Penumadu, Rachel P

A Classroom Project for English 298

Neurodegenerative disease is a broad term for a range of conditions which primarily affect the neurons in the human brain. Neurons make up the foundation of the nervous system, which is primarily the brain and spinal cord. Initially as neurons deteriorate, one will experience relatively mild symptoms, such as difficulty with coordination or remembering names. But as large clusters of neurons die, symptoms progressively worsen. In severe cases, patients lose the ability to walk independently, think clearly, breathe freely, and ultimately carry out vital living functions. In today's modern age, innovative and effective medical therapies are critical for the healing of degenerative diseases. The urgency to finding treatments and cures for neurodegenerative diseases is imperative and present. However, a 100% effective cure to degenerative diseases has yet to be discovered, forcing medical researchers to expand their search to alternative therapies. After a review of scientific literature, secondary sources, and conducting a series of interviews, possible alternative treatments to neurodegenerative diseases are discussed in this paper. This analysis reveals current neurological research to examine possible therapies using nanoparticle drug delivery systems, stem cell technology, and nutrition for the use of diet to treat neurological disorders. Ultimately, all of these methods are promising in offering remedial solution, but do not yet offer a long-term cure. However, the use of drug delivery systems shows especially encouraging prospect in developing a permanent cure to the detrimental degenerative diseases.

Poster # 389

A Female Conductor? What a Concept.

Perkinson, Audriana Elise

A Classroom Project for English 298

This is a classroom project for English 298. Women's fight to be viewed as equal to men has given many rights to women, including the right to a position as an instrumental conductor. However, a female conductor is still a rarity. This classroom project serves to investigate how gender stereotypes might favor male conductors over female conductors. This is important because, as women continue to gain more rights, they deserve their proper place as conductors. The findings were gathered from previous research on the topic and through interviews with two prominent conductors (one male, one female). The previous research supports the idea that male conductors are favored over female conductors. Both
interviewees agreed with this idea, based on history within the field and their own personal experiences. Based on this classroom project, I conclude that males are indeed favored within the field of instrumental conducting.

Poster # 390

Is Religion Absent on Campus: Christian Students’ Perceptions of Religion and Higher Education

Perry, Cameron Miguel

A Classroom Project for English 298

Faculty Mentor: Nicks, Robin Jean Gray

The common perception among religious communities is that college attendance correlates with secularism (Lee, 2002). Many parents and students believe that college may cause them to abandon their beliefs. Low rates of church attendance among young people are often blamed on higher education. However, recent studies have shown that college may not be a determining factor in decreased rates of church attendance and that many students feel they grew spiritually in college. I interviewed three students who participate in campus ministries at the University of Tennessee to investigate how these students engage with the religious community and how their religious habits have been influenced and changed during college. The findings of this study will determine how students perceive the religious community on campus and provide a different narrative of religion on college campuses.

Poster # 391

Fake News, Bias, and How We All Connect

Peters, Jessica Patrice

A Classroom Project for English 298

Faculty Mentor: Addicott, Randi Marie

In recent media, few topics have received as much attention as “fake news”. With politicians and media personalities citing fake news as a reason for conflict, an evaluation of fake news, its influence on its consumers, and how to combat it must be conducted. Studies show that this media has an impact on its audience, creating biases in thinking, changing lifestyles, and affecting learning. Combine this influence with fake news, and current media begins to betray the trust that the public places in it when they look for their news. The public can begin to combat falsity in the media by checking sources for credibility, keeping track of sources when writing a paper, and being generally aware of where news comes from. Fake news is a real issue in the world and can only begin to be combatted when the individual takes responsibility in finding the truth in the news they are consuming.

Poster # 392

Preventing the Problem: Forming New Municipal Waste Policies in Tennessee

Phillips, Houston Daniel

A Classroom Project for English 298

Faculty Mentor: Murphy, Samantha Ann

Within waste management there exists a waste disposal hierarchy which ranks the preferred waste disposal methods. At the bottom of this hierarchy are landfills, while waste reduction sits at the top as the most desirable method. In Tennessee, many current waste programs rely mostly on landfills. More focus and resources should instead be focused on the reduction of waste and waste education programs, especially in rural parts of Tennessee. In this study, current municipal
solid waste policies are examined in Tennessee. Environmental policies in other states as well as around the world are also examined and considered in the context of Tennessee demographics. This is done using the impact of past policies and the results of other studies. The policies can further be observed within the contrast of rural and urban communities in Tennessee. It is decided that though existing solid waste management policies in Tennessee are currently sufficient, more action needs to be taken at the community-level to slow down the rising amount of waste per capita in the state. These actions include further waste management education requirements at the local level as well as the integration of waste reduction programs in areas little or none already in place.

Posters

**Poster # 393**

**Institutionalized Racism as a Political Tool in America and South Africa**

Pool, Nathan Scott  
A Classroom Project for English 298  
Faculty Mentor: McCue, Kristina

Racism has a persistent presence in modern society; it is difficult to escape from it, and it impacts the daily lives of vast populations across the globe. By understanding the role that institutionalized racism plays in the lives of affected citizens, society can begin to move forward and establish a place where all are to free pursue their individual goals, without living in fear of discrimination and oppression. Research conducted by political analyst, Schierup has revealed the immense scale at which institutionalized racism is abused by party leaders in South Africa to polarize the division between native Africans and European settlers (2016). In turn, these findings reveal the ease of which the public opinion has been swayed by these divisive tactics. Additionally, the United States has not been exempt from tumultuous abuses of racism at all levels of government. This is seen in research conducted by Pager and Shepard, who analyze political decisions in the United States and find that officials have utilized racism to motivate emotionally provoking decisions, particularly during the civil rights movement of the late twentieth century (2008). The lessons learned from analyzing the state of institutionalized racism in South Africa and the United States can be applied to in order to help society combat racism and prejudice in modern society through contributions to the greater body of knowledge.

**Poster # 394**

**The Challenges of Female Entrepreneurship: How to Address Them and the Need for Change**

Powell, Faith Michelle  
A Classroom Project for English 298  
Faculty Mentor: Dean, Lance M

One way to characterize today’s economy is by the increase in female entrepreneurs and women in managerial and business ownership positions. The retail industry, specifically, has been one of the most popular industries for female entrepreneurs to enter. However, many female entrepreneurs still face obstacles to creating and developing a business in this industry. One of the major obstacles to the success of female entrepreneurs is gender discrimination. While many researchers have emphasized this obstacle, there are also other significant challenges to female entrepreneurship. In order for the female entrepreneurship field to continue to grow, it is important to explore some of the challenges as well as effective methods of handling them. In this article, I explore these challenges by reviewing the literature that exists on the topic and examining qualitative interviews with female entrepreneurs. I conclude that female entrepreneurs face challenges in the retail industry including finding a work-life balance, a lack of previous business/management experience, and gender bias. However, they can effectively manage these challenges by creating schedules and hiring assistants, networking with people who have previous business/management experience, and being more aware of bias questioning.
Poster # 395

Females in Law: The Challenges in Gaining Partnership and the Need for Change

Powell, Hope Renee

A Classroom Project for English 298 Faculty Mentor: Dean, Lance M

This paper evaluates the challenges that female lawyers face in gaining partnership in law firms. The number of female lawyers presently equals the number of male lawyers, yet there continues to exist a disparity between the number of male and female partners in law firms. In order to understand how to increase female representation as partners in law firms, it is necessary to first identify the specific challenges that female lawyers may encounter. This text reviews literature and studies to better understand these challenges and examines qualitative data from current and former lawyers gained through interviews. The benefits and importance of having more female law partners and possible solutions to the challenges female lawyers face in gaining partnership are also discussed. This paper concludes that utilizing technology to allow female lawyers to complete more of their work at home, educating employees on inaccurate stereotypes and perceptions, and encouraging fair and helpful mentorships can help address the challenges faced by female lawyers to help increase the number of female law partners.

Poster # 396

A Hot Topic: How Political Parties Have Influenced Perception of Climate Change

Pratt, Canaan J

A Classroom Project for English 298 Faculty Mentor: Nicks, Robin Jean Gray

Few issues in today’s political climate are more polarizing than that of climate change. It has become an issue that has not only been noticed in the United States, but also in most of the developed world. As with any issue, political partisanship has managed to worm its way into the mix dividing peoples stances on the issue. The goal of the project was to analyze how these partisanship are influencing thought and political discourse. Three University of Tennessee honors students with different political alignments were interviewed to see how students view climate change through the lens of their political party, what influenced these alignments, and why these party lines might have formed so heavily around the issue of climate change. By transcribing and coding the data, the results can better allow campaign strategists and climate scientists to combat political narratives that could potentially be harmful to society. With the information gained we can see how to better direct our knowledge and efforts to combat or help change these narratives.

Poster # 397

Dungeons, dragons, parents, and panic: How RPG perceptions changed over a generation

Price, Wade Henry

A Classroom Project for English 298 Faculty Mentor: Nicks, Robin Jean Gray

Mentor: Nicks, Robin

Through the moral panic of the 1980s involving Dungeons and Dragons to the game’s relative popularity today, this paper examines the changing perceptions of parents of players over the past few decades. Since parents are some of those most
concerned about the morality of games their children play, three Tennessean parents of adolescent/young adult D&D players were interviewed to discuss their experiences with D&D. Their responses will be analyzed to determine if there is a correlation between parenthood and the perception of D&D, which can lend insight into what can prompt a change of mind over the years, and may help researchers better know how parenting can affect change.

Poster # 398

How Plants Can be Used to Combat Depression, Stress, and Anxiety on College Campuses

Pritchard, Benjamin Donnelly
A Classroom Project for English 298 Faculty Mentor: Newburn, Harry Fredrick

Science is an ever-evolving subject that seems to amaze and revolutionize the way society works. One fairly recent topic in the scientific community is the utilization of plants to combat mood disorders: depression, stress, and anxiety. These mood disorders are an increasingly large problem in modern society, and the healthcare industry is not doing a good job of limiting and regressing the emotional and psychological effects these disorders have on humans. This is where plants enter the picture. In many scientific studies, plants have been shown to decrease levels of depression, anxiety, and stress in veterans that are now students at Texas State University (Kelley et al., 2017). The breakthroughs in this field of research are centralized by the use of plants to stimulate human senses in a positive way, whether that be by smelling particular aromas or seeing increasing amounts of greenery. The roots of this research delve down into our human nature to be more comfortable and feel more at home in the natural environment in which our ancestors came from. This new data can be used specifically on college campuses to combat these mental disorders that plague the next generation of leaders. College campuses around the globe can create a healthier atmosphere for their students by authorizing this revolutionary research to be implemented.

Poster # 399

The Impact of the Affordable Care Act on the Doctor-Patient Relationship

Pritchett, Justin Lee
A Classroom Project for English 298 Faculty Mentor: Newburn, Harry Fredrick

The doctor-patient relationship is a vital part of healthcare, and is affected by a variety of elements. It is important that this relationship remains and the that factors that influence it remain stable. With the introduction of the Affordable Care Act, the foundations of healthcare that guide the doctor-patient relationship are changing, thereby affecting the doctor-patient relationship both positively and negatively. To analyze the changes brought by the Affordable Care Act and how they have impacted the doctor-patient relationship, detailed research was conducted as well as interviews with a UT professor that researches public health and a pediatric nurse practitioner. The researched showed that the most important aspects of healthcare that changed because of the Affordable Care Act and are changing the doctor-patient relationship include the overburdening of doctors with increasing number of patients, lowering quality of care given, increasing demand for care, introducing the idea of population health, and increasing cooperation between healthcare professionals. It was determined that overburdening, quality of care, and population health all were had adverse effects on the doctor-patient relationship. Although the increase in demand for care also had a negative impact on the relationship, this was being countered via incentives. On the other hand, only increased cooperation had an overall positive effect on the doctor-patient relationship. However, it is important to realize that all of the factors are deeply intertwined and sometimes do not have a clear overall positive or negative effect.
**Poster # 400**

**The Implementation and Standardization of the Rooming-In Method for NAS Neonates**

Propes, Kari Elizabeth

A Classroom Project for English 298

Faculty Mentor: Gentry, Elizabeth Leigh

An opioid epidemic is sweeping our nation, causing more babies than ever before to be born with Neonatal Abstinence Syndrome. This means that infants are born addicted to drugs via the mother’s drug abuse during her pregnancy. The withdrawal these babies experience cause harmful, long-term side effects such as deficiencies in mental, social, and behavioral development. The current NAS treatment used in hospitals is only making these negative consequences worse. Hospitals are currently using the “morphine drip” treatment to wean babies off of drugs. While this treatment is effective, it is very expensive, prolongs the infants stay in the NICU, and separates the mother from her child. To fix this issue, hospitals should implement the more effective and less expensive NAS treatment called the “rooming-in” method. This treatment allows the mother to move into the hospital nursery and tend to her child whenever necessary. In this method, the mother is the key factor to the child’s recovery. The “rooming-in” treatment induces a stronger mother-child connection, which in turn helps the child develop at a healthier rate and combat the side effects of withdrawal.

**Poster # 401**

**Book It: Different Generational Views on Electronic Books**

Race, Nicole M

A Classroom Project for English 298

Faculty Mentor: Nicks, Robin Jean Gray

As the education system shifts to a more digital-based environment, e-books and online articles have often replaced readings from physical books. Debates over the benefits and consequences of these electronic books have surrounded the topic. Studies have shown support for both sides of the debate, leading many scholars away from a conclusion. This paper examines how different generations perceive electronic books, especially in the classroom. Interviews were conducted with participants ranging in age and academic level. Results from these interviews will be analyzed to determine trends in generational views. The conclusions made from this study can be used to help instructors alter teaching styles to better fit the generation learning.

**Poster # 402**

**Influence of Metabolism on Gut Microbiome: An Examination of the Symbiotic Relationship Between Host Metabolism and Microbiota Heterogeneity**

Rayder, Christopher Robert

A Classroom Project for English 298

Faculty Mentor: Murphy, Samantha Ann

Metabolism consists of the biochemical processes that occur within an organism that allow it to sustain life. The gut microbiome is the interrelated community of microorganisms that live within gut of an organism that can positively or negatively impact the quality of life of its host. In recent decades, both metabolism and microbiome have been independently studied in order to determine possible health benefits in human beings. Generally, the findings of these studies have determined properties of the microbiome and metabolism that are now well agreed upon by the scientific
community. However, it has only been in the last couple of years that the scientific community has closely examined the specific link between metabolism and microbiome. Many have debated over whether the evidence currently provided allows scientists to determine if there is a feasible and clear connection between a change in metabolism and a change in microbiome variety. This project examines and weighs the evidence available in order to determine and come to a definitive conclusion on whether a connection exists. Despite claims to the contrary by some scientists, the evidence indicates a clear and explicit connection between metabolic processes and microbiotal diversity.

Poster # 403

Eliminating the Stigma Behind Major Depression Disorder (MDD)

Records, Morgan Taylor

A Classroom Project for English 298

Depression is defined as feelings of severe despondency and dejection (“Depression”), which creates an extremely harsh mindset for the people who are afflicted with this disease. This disease effects millions, but is rarely taken seriously due to many people believing it is just a “ruse for attention.” The brain is an extremely complicated organ in the body and depression changes its entire chemical balance, which interrupts normal functioning. People afflicted with depression think differently than people with a chemically balanced brain, and it is a leading cause of disability worldwide (Baune). This paper, through a review of secondary literature and the conducting of interviews, analyzes the chemical changes depression inflicts on the brain and argues that depression should be thought of as a more serious affliction than the stigma behind it suggests.

Poster # 404

Communicating in Crisis

Reed, Lauren M.

A Classroom Project for English 298

The paper reviews the effect of social media on crisis communication. With recent events in Hawaii, there is great attention on how social media functions in crisis communication. Findings through personal interviews and secondary research reveal that while social media is a method for quick relay of information, the wide use of social media has complicated matters for those who issue information from organizations in the crisis. In the first section of the text, the author reviews what crisis communication is as well as the evolution of the field. Definitions and history are followed by personal testimony from experts in the field that can lead to the conclusion that social media is neither fully positive nor fully negative. Findings show that social media can be used effectively when used with a following and a plan for when the crisis occurs.

Poster # 405

The Burden We Bear: What Humans Can Learn from Observing Manmade Global Warming’s Impacts on the Polar Bear

Reid, Cameron Neal

A Classroom Project for English 298

The paper reviews the effect of social media on crisis communication. With recent events in Hawaii, there is great attention on how social media functions in crisis communication. Findings through personal interviews and secondary research reveal that while social media is a method for quick relay of information, the wide use of social media has complicated matters for those who issue information from organizations in the crisis. In the first section of the text, the author reviews what crisis communication is as well as the evolution of the field. Definitions and history are followed by personal testimony from experts in the field that can lead to the conclusion that social media is neither fully positive nor fully negative. Findings show that social media can be used effectively when used with a following and a plan for when the crisis occurs.
For the past several years, climate scientists and biologists have been studying global warming’s observable and potential effects on life on Earth. One area of research looks at how the rising global temperatures are affecting polar bears in the Arctic. Because of the abundance of research into the subject, it is particularly of note. Since the polar bear habitat is sea ice, and sea ice has been decreasing, it is only natural that researchers look at what anthropogenic (or “manmade”) climate change has done to the polar bear habitat and what impacts it has on the future. However, while much of the research has found conclusive effects of greenhouse gas emissions on the polar bear, it does not adequately explain why it matters to humans. Without having a clear understanding of why people should care about the polar bear, scientists and the general public will remain disconnected, creating scientific illiteracy. This project attempts to explain why people outside of the research should take the impacts of global warming on polar bears seriously. It demonstrates that habitat loss, access to food, and overall health outcomes are significant links between global warming’s impacts on polar bears and those on humans.

Poster # 406
A Woman’s Struggle in Medicine: A Qualitative Analysis
Remy, Clare
A Classroom Project for English 298
Faculty Mentor: Dean, Lance M
In the last few decades, more and more women have been entering the medical field, and this new insurgence has highlighted the gender biases that dominate the medical profession, both for doctors in training and for career providers. Women in this field are frequently forced to deal with gender bias that ranges from being mistaken for a nurse to sexual assault. Their merit is often overridden by an environment that strongly supports men over women. Additionally, they are forced to deal with more burdensome commitments to home-life than their male counterparts, forcing them often to sacrifice either family or work. In the workforce, many people allow gender bias to distort their perception of a woman’s capabilities. This study focuses on the experiences of female physicians, which were obtained through a series of interviews with women in medicine. The result of this research is a recommendation for education for everyone in the medical field to bring this issue to light. This training will reinforce the importance of mutual respect in the workplace. It will define sexual harassment and assault with the goal to eliminate it from the workplace, dissuading the perpetrators and giving the victim a formal definition to what they are going through. Women will be able to connect with others who face the same discrimination, creating an environment of support and mentorship, which has thus far been unavailable.

Poster # 407
Digital Walls: Impact of Social Media Use on College Students’ Interpersonal Relationships
Rhoton, Madison C
A Classroom Project for English 298
Faculty Mentor: Murphy, Samantha Ann
This project considers the current debate of how excessive social media use is affecting college students, and extends on that debate by specifically discussing the effects of social media on interpersonal relationships. Before the invention of social media, friends or acquaintances were not as easily accessible, and most aspects of their life were not readily available online. New ways to interact with fellow peers, such as Instagram, Twitter, or Snapchat, seemingly improve college students’ interpersonal relationships by offering this type of information quickly and easily. However, research suggests that these medias are negatively affecting young adult relationships. This project examines the social media use of college students in order to discover what these negative effects are, and what they might mean for future generations.
The project analyzes data from current research in the form of student surveys and psychological examinations in effort to discover how social media plays a role in the developing and maintaining of college relationships. The analysis leads to the conclusion that excessive social media use in college can contribute to a decreased desire to meet with peers face-to-face, an increased desire to impress peers online, and increased chance of developing social anxiety.

**Poster # 408**

**The Technical Challenges Halting the Development of Nuclear Fusion**

Richardson, Jarod Douglas

A Classroom Project for English 298

Faculty Mentor: Barrow, Robin

This is a classroom project for English 298. New, cleaner methods of producing electricity are going to need to take over in the next decades in order to save the earth, and nuclear fusion is looking to be a contender to help solve this problem. Using the same method the sun uses to produce energy, fusion is expected to provide abundant, clean electricity. My goal is to determine the technological hurdles that humanity must overcome before creating the first fusion reactor. This includes looking at some of the current research projects that are being conducted to bring us closer to this goal. I will also delve deeper into specific problems that are looking to be the most challenging obstacles to overcome.

**Poster # 409**

**Nevertheless, they persist: How college women perceive modern feminism**

Richey, Alexandra Katherine

A Classroom Project for English 298

Faculty Mentor: Nicks, Robin Jean Gray

Although gender equality issues in America have progressed since the passing of the 19th Amendment, many citizens are united under the assumption that the fight is not yet over. “Feminism,” “women’s rights,” and “gender equality” are words are frequently employed in the news and on social media, but what value do they hold for female, college students? Previous studies have indicated a disconnect between young women and feminism; however, no recent work has been completed to determine if this view still exists among them. To bridge this gap, three women who are members of the Chancellor’s Honors Program at the University of Tennessee, Knoxville were interviewed about how they perceive modern feminism. By analyzing how young women value the current gender equality movement, it can be determined how it has influenced their perceptions of feminism in the current age of social media and polarized politics.

**Poster # 410**

**Impact of Undergraduate Research on College Life**

Richter, Alexander M

A Classroom Project for English 298

Faculty Mentor: Dean, Lance M

When students get involved with undergraduate research, they are often looking for hands-on experience to better prepare them for a future career. This means many students will participate in undergraduate research during their college careers. However, this research takes time and energy out of a college students’ schedule, which could cause issues for their school work and college life. The question I am investigate whether undergraduate research has any effect on a
student’s classwork or social lives. Interviews with a professor and students participating in research, augmented with secondary research to determine if undergraduate research has a positive or negative impact on a students’ college lives. This research finds that not only does undergraduate research cause few conflicts, it can prove beneficial to students’ academic careers.

Poster #411

The Politics of Fake News

Roberts, Abigail Elizabeth

A Classroom Project for English 298

Faculty Mentor: Addicott, Randi Marie

A population’s overall feeling about the political atmosphere is correlated with the type of news most popular at the time. The more fake news that people are exposed to, the more they feel dissatisfied with politicians, and the more likely they are to watch more fake news. As dissatisfaction increases between political parties, people tend to blame the opposite political party for their problems, leading to an increase in political polarization. This polarization is reflected with government policies, shown in current problems such as an increase in government shutdowns.

Poster #412

The Role of Mathematics and Technology in Modern Music

Roberts, Micah Judson

A Classroom Project for English 298

Faculty Mentor: Newburn, Harry Fredrick

Music, though artistic, is just a combination of numbers to make a finished product. Despite this, many people currently view music, like other arts, as very creative and emotionally driven, even though every construct that defines music can be strictly perceived as mathematical functions. This allows for the advancement of music to correlate with the furtherment of technology. The implementation of this fact is something that is very lacking in the modern standard of music education. Most people in today’s field of music only use technology for menial tasks, and they only use it to perpetuate current standards. Though it’s possible to use these for the advancement of music, people who do so are seen as unique and experimental. By implementing computers to change music, instead of maintaining it, modern music could progress more than ever before.

Poster #413

College is Casual: Motivations Behind the College "Hookup Culture"

Roe, Kathryn Ruth

A Classroom Project for English 298

Faculty Mentor: Nicks, Robin Jean Gray

Many researchers like Fielder, Carey, and Carey (2013) have questioned the frequency and implications of college students’ increased involvement in what is termed the “hookup culture.” While many researchers have been able to determine the number of students who are participating in this culture, the motivations for many college students’ to have, and even prefer, casual sexual encounters over romantic relationships is unclear. This paper studies students’ perceived positive effects of “hooking up,” through four interviews with a sample of students enrolled at the University...
of Tennessee – Knoxville. This research study analyzed student responses to allow for a better understanding of the “hookup culture” at the University of Tennessee and the motivations of students to get involved in these casual sex experiences.

**Poster # 414**

**Morality of Genetic Engineering**

Rucinski, Mason Benjamin

A Classroom Project for English 298

Faculty Mentor: Nicks, Robin Jean Gray

Recent advancements in the field of genetic engineering and modification has made modifying genomes easier and more accurate than ever before. A controversial debate that has emerged is the morality of using this technology to modify the human genome. While there has been documented debate among scientists, little research has been conducted to learn how lay-people feel about the use of this technology on humans. Three interviews with people of differing religious backgrounds and beliefs were conducted to determine how the lay-person feels about the idea of using genetic modification on humans. These interviews reveal how they feel about the morality of editing the human genome and to what extent genomes can modified before it begins to feel unethical. Additionally, this research inquired about the impact that one’s religious affiliation affects that idea of morality.

**Poster # 415**

**Digging Up Definitions: The Real Definition and Value of Treasure Hunters in the Archaeological Field**

Ruleman, Hattie Alexis

A Classroom Project for English 298

Faculty Mentor: Gentry, Elizabeth Leigh

Due to their history of looting and destroying cultural sites, treasure hunters have long been shunned and avoided by archaeologists. This essay offers a new perspective of treasure hunters that the archaeological field has yet to acknowledge. Instead of the simplistic view of the treasure hunting field, this essay distinguishes between treasure hunters who loot for profit and treasure hunters who loot for adventure. In order to consider the possible utilizations of adventure-seeking treasure hunters in archaeology, the past destruction of cultural sites by treasure hunters can be weighed against the possibility of the recovery of cultural sites by treasure hunters. Using archaeological studies, this paper (a) examines the distinction and specific definitions of those who collect to sell and those who collect for an adventure, (b) detaches the stigma of destruction from treasure hunters and onto the real culprits, and (c) explores ways treasure hunters have and can be integrated into archaeology. It concludes that the modern view of treasure hunters by archaeologists is misplaced due to the lack of definitive definitions that distinguish profit-seeking treasure hunters from adventure-seeking treasure hunters. The consideration of these definitions will open the door to more interdisciplinary work between archaeology and treasure hunting that will positively benefit both parties.

**Poster # 416**

**Do the Risks of Xenotransplantation Outweigh the Benefits?**

Saksena, Nihar

A Classroom Project for English 298

Faculty Mentor: Barrow, Robin
Global organ shortages have greatly impacted the world, and this crisis has led to a significant push to find alternative solutions to this problem. The most controversial solution is xenotransplantation, which is the field of using animal or non-human tissues/organs (or xenografts) for transplantation into the human body. To learn whether the scientific community believes that the risks of xenotransplantation outweigh the benefits, I interviewed an expert in the field of biomaterials to gain a deeper understanding of the field and their opinion of its effectiveness. To learn whether the public agrees, I interviewed a non-STEM major undergraduate student. The interviews found that the scientific community and public agree that if the risks of xenotransplantation were minimized, then the potential benefits of this would outweigh the risks and aid in the global organ shortage. To minimize the risks of organ rejection, organ destruction, and infections from xenotransplantation, organs must be decellularized and processed to remove certain proteins. As a result, more organs would be provided for patients, organs that have a higher chance of matching patients, and organs which the human body will not reject.

**Poster # 417**

**The High School Effect: Which type of schooling best prepares students for college success outside of the classroom?**

Salameh, Mustafa

A Classroom Project for English 298 Faculty Mentor: Nicks, Robin Jean Gray

The debate concerning public, private or home-school education in high school is a prevalent one as parents hope that the education they choose for their children is the one that will most prepare the students academically for college. As a result, countless amounts of research has been conducted comparing the three differing types of high school education as “Education experts seem to concur on almost nothing. Research in the field is so politicized and contradictory that you can find almost any study to support your view” (Monte and Dahmen, 2009). However, this study investigates how the differing secondary educations that a student receives in high school effects the student’s social experiences and their overall transition to college. Variables examined included high schools attended, involvement in differing organizations in high school and college and the information gained concerning their social experiences in order to create an accurate depiction of the students outside the walls of the classroom. Although students who attended traditional high school settings knew copious numbers of people before coming to the university in comparison to the home-schooled students, all groups looked to expand their horizons and step out of their comfort areas through different means.

**Poster # 418**

**Exploring Continued Social Media Usage in Young Adults Despite Negative Effects**

Sallee, Abigail Madison

A Classroom Project for English 298 Faculty Mentor: Dean, Lance M

With the invention of smart phones and other technology, social media sites, such as Instagram and Facebook, have continued to grow in popularity, with an annual growth rate of ten percent. While sites like Instagram aim to aid people in sharing their lives through pictures, many negative outcomes have been observed. Previous studies have found these outcomes, which are prevalent amount young adults, to include symptoms of depression, anxiety, self-esteem issues, and confidence issues. This study qualitatively identifies and addresses themes regarding the reasons why young adults continue to use these social media sites despite the negative repercussions. An eighteen-year-old with social media, an eighteen-year-old without social media and a high school guidance counselor participated in the study via in-person interviews. The study addresses themes including self-esteem, confidence, acceptance, peer pressure, depression, and
Poster # 419

An Investigation Into the Network Security of Major Companies

Samar, Jacob Conner

A Classroom Project for English 298

Faculty Mentor: Addicott, Randi Marie

In recent years, the quantity of cyber-attacks has increased dramatically. This has affected even massive companies such as Yahoo and Equifax, who each should have the resources to appropriately defend the data they secure. With the real victim of these breaches being the consumers who have had their confidential information stolen, it leads to the question of why these companies can skimp on security and face no consequences when the inevitable happens. This paper analyzes the causes of various hacks and seeks to prove that companies cannot be trusted to implement security measures to protect the information of their users. Implementation of appropriate federal regulations that will improve data security is a difficult issue that must work effectively without putting to much of a burden on the companies it seeks to regulate. This regulation is necessitated by a lack of concern over proper cybersecurity and is in the best interest of the consumer.

Poster # 420

High Aspirations for Low-Income Students

San Miguel, Emalyn Samalio

A Classroom Project for English 298

Faculty Mentor: Addicott, Randi Marie

In this research essay, the discrepancy between high-income and low-income education was studied. With the No Child Left Behind Act passed in 2001 and the Every Student Succeeds Act passed in 2015, the government has made various attempts to solve this problem with different educational programs. However, there has been little change in poverty levels since the 1960s when the Elementary and Secondary Education Act was implemented. The problem with the government’s approach to solve this issue is that the programs implemented focus solely on test scores instead of the educational future of the students. In other studies, findings suggest that high aspirations and a growth mindset benefit low-income students because these children aim to attain a higher education in order to rise above the poverty level. Therefore, I propose that the solution to this nationwide problem is developing programs that focus on bettering the current status of the students and helping them plan for a future above the poverty level. Secondly, these programs should take place in a non-classroom setting for better engagement in the program. Mindset and motivation are major factors that need to be greatly considered when improving an impoverished child’s future.

Poster # 421

Community Health Depends on Responsible Parents: How a Parent's Choice to Reject Vaccinations Affects the Health of the Community.

Scott, Heather

A Classroom Project for English 298

Faculty Mentor: Murphy, Samantha Ann
In a time where medical advancements have led to the cure of some of the worst diseases of the past century, some parents have made the ill-considered decision to reject vaccinations. Many people do not understand how that choice may impact a community. Herd immunity, which occurs when most of a population is immune to a disease, provides a safety net for the children who are medically exempt from vaccines because they have cancer or autoimmune disorders, but if healthy children stop getting vaccinated, then the diseases of the past may return and threaten the lives of the medically exempt children. The reasons parents give for non-vaccination tend to be ambiguous, ranging from toxicity to impeding the immune system to causing autism. While their hesitancy can be understood, all of the reasons that most non-vaccination parents give have been repeatedly disproven and physicians encourage parents to vaccinate. Vaccinations are an absolute necessity for defending the health of everyone in a community, and without them, those who suffer from cancer and immune system diseases may not make it past childhood. The reasons to vaccinate are clear and parents must remember that it is not only their child that the decision impacts.

**Poster # 422**

**The Origin and Rationalization of Japan’s Eugenic Protection Law**

Shannon, Laura Kaitlyn

A Classroom Project for English 298

Faculty Mentor: McCue, Kristina

Japan’s Eugenic Protection Law replaced its former, less extensive eugenic policies following World War II, and the repressive nature and abuse of this law led to forced sterilizations on the disabled and numerous other violations of human rights. Recent research has concluded that external global influences, internal political influences, economic devastation, and social expectations surrounding women and the disabled all contributed to the creation of these laws. The theory that Social Darwinism created a stronger population was globally prevalent in the 1940s, pressuring Japan to follow suit as, according to Dikotter, the law was modelled after a law originating in Nazi Germany. Japan’s dismal economic and social condition following the war led its people to try to resurrect their national identity and its government to seek control in different aspects of its population, namely reproductive policies. Many political interest groups, such as feminist and conservative groups, engaged in discourse concerning reproductive rights which played a major role in the development of the laws. Additionally, stigma surrounding the disabled and pressure placed on women to produce genetically superior children resulted in people rationalizing and disregarding the inhumane nature of these laws. The current study concludes that, historically, societies stricken with national devastation and normalized social stigmas are susceptible to the compromise of basic human rights, and globally there are social prejudices and neglected people groups that could potentially be harmed when national tragedies occur.

**Poster # 423**

**Generational Perspectives on Apologetics**

Shipley, Jordan Rebekah

A Classroom Project for English 298

Faculty Mentor: Nicks, Robin Jean Gray

With the recent explosion of “fake news” in the media, we find ourselves wondering how we know what we think we know. This research explores perspectives on apologetics in the Protestant Christian subset of the population, and how age affects those perspectives, by interviewing one member of each of the UTK campus ministries Chi Alpha and Volunteers for Christ and one adult Christian unaffiliated with the university about their perspectives on apologetics, defined by the Catholic Encyclopedia as a branch of theology dedicated to the defense of the Christian faith, and analyzing
the responses given according to the ages of the participants. This research provides valuable insight to people attempting to enter into ministry with college students by explaining one of the many ways in which the younger generation approaches their faith differently than the elder.

**Poster # 424**

**The Impact of the Built Environment on Human Well-Being**

Shoffner, Grace Elizabeth

A Classroom Project for English 298 Faculty Mentor: Newburn, Harry Fredrick

In a world where ways to control almost every aspect of life have been discovered, why have we not paid more attention to how the structure of our built environment affects us? In the past, design has always served a strictly functional purpose, yet as technology continues to progress, design must adapt. The question now is not whether the design has an impact on people, but how it impacts the individual in different ways. Over the past few years, architects, designers, engineers, psychologists, and others have come together to figure out better ways to build the world around us. They look at how communities connect with one another, focusing on urban planning and how to make urban and individual spaces more active. They research how specific designs should be used in different contexts, how aspects of buildings can contribute to stress, and how color impacts someone’s perception of a space. These elements of design all come together in our immediate environment and influence our well-being, mental and physical. In the future, we must be aware of the importance of architectural design in our lives and push for a change to improve cities and communities in order to make a positive impact on the built environment.

**Poster # 425**

**The Impact of Harry Potter**

Shuttleworth, Mary Grace

A Classroom Project for English 298 Faculty Mentor: Addicott, Randi Marie

The *Harry Potter* novels contain many underlying, real-life themes, such as power, and are just as prominent in these novels as they are in our lives. From the influence of politics to societal power, these aspects resonate in the lives of *Harry Potter*’s readers. Because of its real-world ties with political power and the notion of good vs. evil, the readers of *Harry Potter* benefit from it by learning to better empathize with the privilege and forms of power in their individual lives. When generally thinking of the idea of power, politics is one the first subjects that comes to mind. Real-life political ideas translate seamlessly into the magical, wizarding world, and the notion of good versus evil in the novels is a very prominent theme of power through more characters than one. I will discuss and analyze how these ideas impact the readers and how they teach them the power and ability of empathy.

**Poster # 426**

**The Human Genome Project: Creating a Healthy Future**

Shymlock, Hayden C

A Classroom Project for English 298 Faculty Mentor: Barrow, Robin
The Human Genome Project was the first study of its kind, an international research attempt to map and sequence all the genes of mankind; essentially mapping the genome of Homo sapiens. Even after completion in April of 2003, the Human Genome project still remains one of the world’s largest collaborative biological projects. Studies were conducted in twenty universities spaced across the United States, the United Kingdom, France, Japan, Spain, Germany, and China. Even though the project was not able to sequence all DNA in human cells, it was able to sequence 92% of the human genome all of which coming from euchromatic regions. The Human Genome can be used to help us further understand ourselves, whether it be by helping us to find appropriate treatments for specific viruses or by showing us ways we can design and modify medications for best results. My work aims to discover the effect the Human Genome project has had on the medicine field, particularly in cancer research, since its completion in April of 2003.

Poster # 427

Forever Alone: A Study on How Remaining Single Affects Emotional and Academic Life
Sims, Kayla Noelle

A Classroom Project for English 298
Faculty Mentor: Nicks, Robin Jean Gray

Romantic relationships are a natural part of adolescent life, though the timing for the exploration of romantic relationships varies on a person-by-person basis. Studies have shown that romantic relationships can both hinder and help the self-esteem of children and adolescents, based on the nature of the relationship. Despite this, studies have also shown that there is no direct and significant impact of romantic relationships on and adolescent’s GPA. While many studies have focused in on the experiences of romantically involved students, studies never look at the issue from the flipped perspective. This study aims to look at the effects on emotional and academic health of students who have been single their entire life, hoping to gain a new perspective on the phenomenon. Three students from the Chancellor’s Honors Program at the University of Tennessee who have never previously been involved in a romantic relationship were selected and interviewed in order to gain their insight on their personal experiences. Insight from this study can be used to help professors and university officials better understand the background and reasoning of their students.

Poster # 428

The Ethics of Fish- Keeping
Singleton, Sarah Alexandria

A Classroom Project for English 298
Faculty Mentor: Newburn, Harry Fredrick

Care Acts for the welfare of animals have existed since the 1800s; however, they have yet to be extended to fish. The purpose of my project was to examine the debate on the likelihood of higher cognitive abilities in fish and their mistreatment in America. My research showed that the main indicator to determine pain reception and cognitive abilities in any living organism, the presence of nociceptors, were found in many species of Osteichthyes, bony fish that comprise ninety-five percent of all fish species, but not in Chondrichthyes, cartilaginous fish. This out-of-date practice undermines that fact that amphibians and birds lack nociceptors, yet they are included in Care Acts as organisms that exhibit pain. Nonetheless, many scientists state that fish are incapable of any higher form of consciousness due to Chondrichthyes lacking nociceptors. This leaves the other ninety-five percent of fish to be subjected to mistreatment in homes, stores, and laboratories all over the America. The interviews I conducted exemplified the ignorance that Americans have towards fish, seeing fish as mere decorations for the home and as “trial pets.” Through personal experience and the interviews, the label requirements for fish and the images for products on the shelves in many pet stores do not correlate with one
another. This inconsistency in displayed information has caused Americans to view fish as products that do not require adequate care and has served to sway a consumer's overall ideas on fish-keeping.

**Poster # 429**

**The Effects of Diet and Exercise vs. Fad Diets of Weight Loss**

Smith, Mariah Nicole

A Classroom Project for English 298

For decades, the desire to shed pounds as fast as possible has led to the continuous search for quick, easy, and efficient methods for weight loss. Because of this, the diet industry has experienced major success over the years, as new diets, detoxes, and “slim teas” promise to melt pounds off over the course of a few weeks or even days. However, some of these popular and successful weight loss methods can be ineffective and even dangerous. It has been proven by various studies that a healthy regimen consisting of a healthy diet and exercise is the most efficient form of weight loss, despite having a longer timeline for results. Regardless of this, people continue to utilize these alternative weight loss methods regardless of the possible health issues they may cause. This project aims to identify the key differences between the effects of diet and exercise on weight loss versus the previously mentioned alternative methods. Furthermore, I hope to identify reasons why these alternative weight loss methods continue to gain popularity despite their possible health consequences.

**Poster # 430**

**Mitigating Major Entrepreneurial Risks**

Smith, Sidney Christopher

A Classroom Project for English 298

This paper addresses the types of risks that small business entrepreneurs will face when starting and operating their businesses. Using secondary source research and the testimonies of three entrepreneurial experts the main risks and the best ways to go about managing them are outlined for the reader. Whether it be dealing with financial risks, operational and competitive risks, or even just balancing your work and personal life, the basic steps needed in overcoming these obstacles are provided. It gives strategies on finding ways of procuring funds for a new startup and staying relevant when faced with fierce competition. This study recommends that the best ways to mitigate major risks are to know your consumer, take proper measures to secure sufficient funds, and find ways to stand out against your competitors.

**Poster # 431**

**Altered Self-Presentation and the Role it Plays on Social Media**

Soldner, Isabel Sophie

A Classroom Project for English 298

This project focuses on the effects that altered self-presentation online has on adolescents, including underdeveloped social performance and insecurities derived from using social media. It begins by discussing social media’s many uses, and impacts that go beyond the screen. It highlights how young adults build their identities online, due to the desire to be liked by others and accepted in social circles. The paper analyzes how altered self-presentation online has the power to
mislead an audience. As a result of these practices, some people resort to online interaction because of their insecurity in interacting with people face to face. The opposition is also addressed—authenticity as a healthy alternative online gives readers insight to how being authentic leads to lower levels of stress concerning online presentation. Social media provides individuals with ways to flaunt their lifestyle, with the goal of receiving affirmative reinforcement from other users. The paper takes into account both the positive and negative aspects of social media usage, as well as the reasons behind and effects of altered self-presentation online concerning younger generations.

Poster # 432

Ending Hunger in America
Speckner, Vincent Michael
A Classroom Project for English 298

The purpose of this research paper was to examine food pantries in the United States, which were originally intended to be a short-term solution to the problem of food insecurity, and determine if they are fulfilling their role, whether they are still necessary, and what sort of systemic changes could be made to further combat the issue of hunger. In addition to consulting secondary sources, interviews were conducted with a grocery store manager and a food pantry director. Due to how hunger remains a widespread issue and that solving the roots of it would likely require serious and widespread changes that are unlikely to happen in the near future, it is posited that food pantries are likely to continue to exist just as they have already done for decades. With this knowledge, the paper concludes that food pantries are necessary and should be rethought as part of a long-term solution that should also include systemic changes in the form of government funding and support for gleaning programs.

Poster # 433

Greek Temples as Symbols of Power
Spock, Sophia Teresa
A Classroom Project for English 298

Greek architecture has long held a connotation of power because of the structure’s ties to the establishment of democracy and Greek deities. Because of this, characteristics of Greek architecture are often replicated in modern age civic buildings in order to translate the powerful connotation into those structures. These replications have been widespread throughout the western world, and are typically found amongst state capitol and monuments, in order to better convey the power of the democratic government, and the implied god like qualities of leaders. Specifically, this paper will investigate three case studies of civic buildings, the Tennessee State Capitol, the Pennsylvania State Capitol, and the Lincoln Memorial, in order to better understand how and why Greek architecture was chosen.

Poster # 434

Carbon Contamination in Electron Microscopy
Spurling, Robert Jackson
A Classroom Project for English 298

Faculty Mentor: Dean, Lance M
Electron microscopes perform imaging at the atomic level. In order to take useful images at this scale, high resolution is required. Resolution is easily compromised, however, by contamination of the sample through contact with carbonaceous species. To be more specific, hydrocarbons (which can originate from almost anywhere, including the atmosphere, vacuum pumps, sample cleaning supplies, etc.) are electronically attracted to the electron beam used for imaging. This causes undesired hydrocarbon buildup around the imaging site on the sample. This buildup can interfere with imaging by reducing the resolution of images taken of the sample surface as well as by absorbing characteristic X-rays that can be used to perform chemical analysis on the sample. The problem of contamination may be mitigated through a number of various procedures both in situ and ex situ; however, these processes may often be time-consuming and therefore not always practical, especially during time-sensitive experiments. This, then, leads to the question of whether or not more effective, efficient methods of preventing contamination exist. Through secondary textual source research as well as interviews with microscopy and microanalysis experts at the University of Tennessee, Knoxville and Oak Ridge National Laboratory, this paper analyzes the ways that contamination is dealt with in the research sector as well as what opportunities may exist for limiting contamination more effectively in the future. This study finds that contamination, though a significant problem in electron microscopy, can be effectively mitigated through a combination of procedures and can be limited further by the development of new technologies.

**Poster # 435**

**The Relationship between Public Transit and Politics**

Stanford, John Riley

A Classroom Project for English 298  
Faculty Mentor: Dean, Lance M

Public transit in America is a vast network of interconnected systems of transportation. It is therefore expensive and highly complex, making it a difficult issue to manage in our political system. Lately, America’s public transit has fallen into poor condition, and the urgency to improve it has exposed fault lines in our politics. This paper uses surveys of political views in young Americans and an interview with a public transit expert to understand what holds the nation back from progress on this issue. Specifically, fundamental differences in the views of government’s role in society are analyzed, and additional research investigates how these differences relate to urban-rural divide in America and the power differentials between federal and local governments. I conclude that the ideological differences about what the federal government should fund and to what extent, resulting largely from the urban-rural divide in modern politics, are the biggest political divisions holding back progress in public transit.

**Poster # 436**

**Impact of Artificial Intelligence on the Workforce**

Stanton, Megan Elizabeth

A Classroom Project for English 298  
Faculty Mentor: Dean, Lance M

Artificial intelligence has long been defined as any type of machine that perceives its environment and takes actions that maximize its chance of successfully completing goals. Recently, researchers have been trying to look at whether or not artificial intelligence could take over or replace certain jobs. Mainly, these jobs would include blue collar worker type jobs, but recently, researchers have found that white collar jobs could also be affected. The way that this topic was researched was in the form of interviews. I interviewed two experts in artificial intelligence for their knowledge about artificial intelligence and its capabilities. The third interviewee was another expert who was interviewed qualitatively to get an
understanding of how AI is used in their workplace. I also utilize several sources to get a deeper understanding of artificial intelligence and its impact on specific jobs. In this essay, I argue that while some jobs will be taken over by machines, many more jobs will be created that will require a different kind of skills set. Moreover, most jobs will not be completely taken over by machines, but rather man and machine will work together in order to complement each other and become more efficient overall at their job.

**Poster # 437**

**Worldwide regulatory bodies: consistency is key**

Stapleton, Aaron Matthew

A Classroom Project for English 298 Faculty Mentor: Addicott, Randi Marie

Historically, biomedical regulatory bodies across the world differ in their standards of approval. Subsequently, companies who produce drugs or devices must go through several long and daunting approval processes to market their items. Since each regulatory body is different, this yields different times-to-market for individual products in different countries. More specifically, the diabetes technology market has seen varying approval times for technologies like the flash glucose monitor and the closed-loop insulin pump between the USA and Europe. Inevitably, many diabetics across the world are often left to ask, “What about us,” when another country approves a forefront medical technology more quickly. The implications of varying approval times drastically affect diabetics as they heavily rely on technology to inform themselves about their glucose levels and how to maintain them. Ultimately, standardizing the approval process of biomedical technologies across the world will create a more parsimonious system in which consumers will have the luxury of knowing that they have access to the most forefront medical technologies in the field.

**Poster # 438**

**The Representation and Perception of Disabilities in the Media**

Stegall, Caroline Foster

A Classroom Project for English 298 Faculty Mentor: Dean, Lance M

In recent years television and movies have taken steps towards better-representing diversity and minorities in their work. Females are being cast as leads in big box-office movies, previously under-represented races have their own TV shows, and LGBTQ characters are relatively frequently featured. However, Hollywood is still lacking overall in regard to people with disabilities. Often characters with cognitive or physical disabilities are stereotyped, used as a cruel punchline, or not shown at all. This study argues that the way people with disabilities are portrayed in the media directly affects the viewer’s perception of them. To achieve this, I examine secondary sources and conducted a qualitative interview and survey. I found that when disabled characters are depicted as weak, helpless, or vulnerable negative stereotypes are reinforced. However, I conclude that when people with intellectual and developmental disabilities (IDD) are featured more frequently and in a more positive light, it helps to normalize disabilities and close the gap between the general population and people with disabilities.
Direct-to-Consumer Genetic Testing: An Investigation of the Ethics of Personal Medicine

Stevenson, Parker Kathryn

Emerging personal genetic testing companies currently hold the largest collections of genomic data in the world, meaning the majority of the world’s genetic information is privately-owned by companies like 23andMe. The current lack of formal and enforceable policy in this growing industry allows these private companies to generate profit from the general public’s curiosity about their genetic history and concern about their heritable disease risk without adherence to ethical standards expected of other institutions that handle personal medical information. Lack of policy regarding data security and privacy threatens consumer autonomy; an examination of research on this matter found that private genetic testing businesses are not currently bound by regulations to uphold the same ethical standards as other organizations like hospitals and even privately-practicing physicians. Direct-to-consumer genetic testing companies are essentially altering the accepted practices in modern bioethics because consumers of personal medical information are now buyers of their own personal health information. After assessing the collective opinions of ethical concerns surrounding these companies, the current study has concluded that regulation could serve as a bridge between the interests of companies and consumers. Without the enforcement of policy regulating their operations, direct-to-consumer genetic testing companies essentially monopolize predictive medicine – due to their possession of the world’s most extensive collection of genomic data – and will continue to do so without regulation and oversight. Future studies investigating this topic need to approach the logistics of how regulations monitoring private information handling in medicine could be potentially implemented within the privatized industry of genetic testing companies.

The F-35 Joint Strike Fighter: will this project ever be able to take off?

Suggs, Tucker Ward

From troops on the ground to giant aircraft carriers, the U.S. spends the most money on its military out of any country in the world. One money pit that the U.S. government continues to sink its resources into is the F-35 Joint Strike Fighter. This new plane was supposed to revolutionize the way we fly, fight, and win, however, through years of technical difficulties and millions of dollars some wonder whether the project should have ever been started. This essay responds to the governments strong unwavering support of the F-35 joint strike fighter. This essay argues that while the F-35 may bring some advancements and there are some contingency plans that are given for when the price of the project skyrockets, it is not enough to justify the exceptional amount of spending on this aircraft and countless safety issues. These arguments are supported mainly through the extensive analyses done through the statistics and statements made by several governmental and congressional committees. This essay concludes that the entire F-35 program should be put on hold and re-evaluated before the government continues to spend millions of dollars per year on a faulty aircraft.

Hope for The Hopeless: Could Religion Protect Against Suicide?

Sullivan, Ali
Suicide is one of the leading causes of deaths in adolescents with rates rising steadily over the years. People have begun to wonder what might cause suicidal thoughts or actions in a person as well as prevention methods. Research has shown that those affiliated with a religion are prone to have higher levels of happiness, thus making religion a possible tool to fight against suicidal ideations; however, with a complex topic like religion, more research must be done to determine factors that might alter its influence. Interviews were conducted with a licensed psychologist, a Christian student at The University of Tennessee Knoxville, and a religious studies student at Tennessee Technological University; the participants were questioned about their thoughts on religion and its effects on suicidal ideations as well as what factors might affect its influence. The results can be used to continue research and as new possible implications for therapeutic sessions.

Keywords: religion, spirituality, suicide, hopelessness, burdensomeness

Poster # 442
Substance Abuse in the Appalachian Region: Understanding the Causes, Consequences, and Misconceptions
Summers, Rachel AnnaRose

The problem of substance abuse began to rear its ugly head in the Appalachian region in the mid-1990s. A majority of the jobs in the region involved manual labor, such as coal mining. High reports of work-related injuries sustained in coal mining, paired with a push from medical groups for doctors to more adequately combat patient pain, resulted in physicians prescribing opioids far more frequently in the region. However, as the nation has relied less and less upon coal for energy, these communities, which once had well-paying coal jobs, have suffered. Anyone with financial means or higher education has left for the better opportunities found elsewhere. The resulting individuals, therefore, live in poverty, with a lack of education and jobs, having already been introduced to the world of addicting opiates. As a result, many residents have turned to drug abuse and to the drug trade to make money and to fight their own personal woes. This problem has further escalated by lack of action from political entities, which has allowed substance abuse in the Appalachian Region to exacerbate into an opiate epidemic. Furthermore, this paper discusses the consequences of this epidemic, including deaths, criminal behavior, economic burdens, and the effects on schools, workplaces, children, and families as a whole. Finally, this paper acknowledges opposition by arguing that addiction is a disease and should be treated as such and makes conceptual suggestions for improvement in American society in order to help combat the issue of substance abuse in the Appalachian Region.

Poster # 443
The Christian College Student’s Definition of Truth
Sutinis, Mary Allison

Plenty of studies have explored the diverse definitions of truth and how different people groups perceive the meaning of truth. Despite the plentiful research on “truth”, there seems to be a lack of research on how college Christian students define truth. This study attempts to better understand this neglected area by conducting 20-30 minute interviews with three college Christian students, asking questions to reveal how they define and understand truth. The study also compares the relationship between each student’s definition of truth and their personal faith. Their responses were
recorded and coded to compile information and material on the topic. The information gathered will help to enhance and further the conversation between Christian and scientific communities in regard to truth.

Poster # 444

How Battery Technology Limits the Electric Car Industry

Swan, Richard Henry

A Classroom Project for English 298

Faculty Mentor: Dean, Lance M

Electric cars over the past decade have become increasingly popular among consumers worldwide. There have been many factors that have led to this increase including improvements in electric car technology, rising prices of gasoline, and environmental concerns. However, progress has been limited by several factors as well, such as limitations in battery technology. This leads to problems with driving range, charging speed, and cost. Currently electric cars are a good fit for people who are looking for a more efficient secondary car to commute to and from work but are not yet to the point where they can serve effectively for most drivers as a stand-alone car. The Tesla line of vehicles are closest to this goal, but their high cost makes them uncompetitive in the mass market. For the electric car industry to break through battery technology must improve significantly and one way this may happen is through the integration and development of solid state batteries. This paper, through several interviews with electric car drivers and potential car buyers, explores the limitations of electric cars and how these limitations impact the decision to buy an electric car. It also explores how electric cars can build off of their success as commuter cars.

Poster # 445

The Influence of Eden: Religion's Effect on Happiness and Development

Sweat, Christopher Denham

A Classroom Project for English 298

Faculty Mentor: Addicott, Randi Marie

This paper investigates the relationship between religion and societal development. Specifically, an analysis is conducted on how religion may exert positive or negative influences on the economic stability of a country, the happiness and well-being of its inhabitants, and the efficacy of the governmental structure. Multiple psychological studies corroborate religion to have a slightly positive influence on reported happiness among participants across numerous countries, but these findings are varied by circumstance and, in some cases, can prove detrimental to an individual’s well-being. The economy within theocratic governments is stunted significantly when compared to secularized states, and the very structure itself offers numerous opportunities for an authoritarian or totalitarian government to develop. This indicates an abuse of power in religiously founded governments, leading to an overall decrease in citizen’s reported well-being and financial stability. Religion may have slight benefits towards certain aspects of society or a sovereign state, but overall it provides too many opportunities for the succession of an overbearing or dogmatic government and is ultimately too restrictive on community progression and individual well-being.

Poster # 446

Saving the World on College Campuses

Sweet, Levi T
A Classroom Project for English 298
Faculty Mentor: Barrow, Robin

This class project for English 298 surveys the sustainable practices being performed on college campuses and the extent to which those practices are important to society. The investigator examined several secondary sources and interviewed professionals in the field of sustainability to determine the answers to these questions. This inquiry found that colleges use a wide array of methods such as green power purchasing, alternative transportation, and building commissioning to promote and encourage sustainability, and colleges and universities are important to social movements like this because of the concentration of future leaders on their campuses. In conclusion, this project finds that colleges are the ideal starting points for the growth of sustainability from which all other sectors of society can be reached.

Poster # 447
Machine Learning and its Applications on the Autism Spectrum Disorder
Tailor, Kishan K.
Faculty Mentor: Barrow, Robin

This qualitative research project is a classroom assignment for English 298. Autism is being identified at a higher rate in the United States than ever before, and our methods are becoming increasingly inefficient in not only diagnosis but also in treatment. This study was conducted to determine the potential impact machine learning could have on how we diagnose and aid individuals on the autistic spectrum. The main methods of the study relied on interviews with 4 professors, each bringing new insights within their respective fields of machine learning, artificial intelligence, and special disabilities. In sum, each professor explained how bright the future could be for machine learning in medical science. Advancements in machine learning have provided new opportunities on how we approach autism, allowing for earlier and accurate (up to 89 percent) diagnoses, while also providing improved methods of helping individuals cope with the disability. These findings can allow for autism to decrease in intensity and provide for treatments with increasingly positive results.

Poster # 448
The Effects of External Variables on Golf Ball Dynamics and the Ability of Golfers to Calculate Them Subconsciously
Throneberry, Caden Avery
Faculty Mentor: Dean, Lance M

The sport of golf is played in a wide range of conditions in which the wind, temperature and altitude fluctuate from day to day and even from minute to minute. How do these factors affect the playing conditions of a golf course, and do expert golfers subconsciously calculate these effects? This research answers these questions through a compilation of quantitative data on the effects of golf ball dynamics in varying conditions as well as qualitative data gathered through interviews of experts in the golf industry on how a golfer may combat these external forces. The study concludes that expert golfers are not fully aware of the tremendous power external forces have upon golf ball dynamics, yet they subconsciously are able to calculate minute changes in the inconsistent external variables that are out their control to shrink their margin of error as much as possible.

Poster # 449
How the Show Keeps Going On
Tillman, Sarah Elizabeth

A Classroom Project for English 298

This paper holistically explores the market of live music and small venues. Secondary sources provide information about the logistical and detail-heavy business model of owning and operating a music venue. Qualitative research, derived from interviews with performers and concert-goers and a voluntary response survey, consider the varying perspectives, experiences, and relationships people have with venues and live music. This paper explores the connection between a venue’s structure, a performer’s preference, and an audience member’s experience. Not only does this paper outline the business concerns a venue must bear in my mind, but it also considers what allows a venue to succeed and thrive. Venues must find their unique balance between making a profit and keeping everyone – audience, performers, and venue – happy. The qualitative research suggests certain trends in audience perspectives and experiences. Combined with the secondary sources, the paper concludes by emphasizing that venues must prioritize the experience aspect of their business in order to not only survive, but to succeed.

Poster # 450

Corruption Comes from Below: Analysis of the Underlying Causes of Low-Level Corruption

Ting, Jonathan Jinghsiang

A Classroom Project for English 298

This essay demonstrates that the current methods of anti-corruption enforcement are ineffective, in that prosecuting and jailing corrupt officials without enacting meaningful change addressing the underlying issues is contributing to the establishment of low-level corruption, corruption among street-level bureaucrats. The essay finds that certain underlying issues within governmental structures turn corruption into an inevitability that persists regardless of incarceration rates and addressing those underlying issues is a more effective form of anti-corruption measures. It contends through studies done on South American countries and China that anti-corruption measures must incorporate the behaviors of the citizenry in order to prevent corruption tolerance from developing. By examining studies of flawed governments dealing with higher levels of low-level corruption, certain identifying characteristics are apparent that contribute to low-level corruption: (a) an increased autonomy between the higher and lower levels of government, (b) a lack of Western governmental influence, and (c) a lack of resources provided by the higher levels of government to the street-level bureaucracy. The results conclude that current anti-corruption methods are ineffective and only tackle the most visible aspects of corruption and that future policies must first address the underlying causes that perpetuate corruption.

Poster # 451

Assessing the Lost Cause: An Examination of Ideas about the Antebellum South

Tracy, Jarrod A.

A Classroom Project for English 298

This paper analyzes the historical validity of “Lost Cause” myth created in the southern United States after the defeat of the Confederate States of America in the Civil War, and its effects on knowledge of the truth about the South’s motivations for fighting the war. While the Lost Cause claims that the South fought for a genteel antebellum way of life and an abstract notion of states’ rights, the paper furthers the idea that the South fought to protect slavery and the subjugation of black people.
In addition, the essay assesses the lasting cultural impact of the Lost Cause in Southern literature and culture before analyzing the motivations of the creators and espousers of the mythos. In order to examine those ideas, the essay focuses on picking apart the constituent elements of the cause, taking a comprehensive look at the rhetoric of the Cause, and the ways in which it created characters and glorified Confederate soldiers and leaders while vilifying influential Union commanders. Throughout the paper, the ideas presented about the Civil War South are bolstered by a significant amount of secondary research and firsthand interviews.

Poster # 452

The Biological Reality of a Zombie Outbreak: A Study of the Diseases Possessing Symptoms that Resemble the Common Depiction of a Zombie

Trainer, Matthew Ryan

A Classroom Project for English 298

Faculty Mentor: Gentry, Elizabeth Leigh

This paper takes an in-depth look at a few diseases that cause symptoms similar to that of popular depictions of a “zombie” in modern film and entertainment. There is no formal definition of the term “zombie,” therefore, the definition used for this research is as follows: a slow, limping walk; blank gaze; agape, drooling mouth; decaying skin; and aggressive, cannibalistic tendencies. The diseases that share similar symptoms are chronic wasting disease, leishmaniasis, rabies, and influenza. This paper will compare studies of the four different diseases against each other to get a general sense of what each disease does, and it will then discuss how each disease relates to the common definition of a “zombie.” There is very little recognition of the reality of these diseases having the potential to cause something apocalyptic, which is concerning because the possibility is real.

Poster # 453

The Problem with Chain Stores and Why Local Business Should Be Supported

Tunnell, Josie Jones

A Classroom Project for English 298

Faculty Mentor: Newburn, Harry Fredrick

The suburban culture is commonplace today because of the rise of chain stores. These types of shops were created in the 1950’s after World War II in response to an era centered around profit and accessibility that steered away from worker’s rights and production ethics. Although viewed with enthusiasm at first, the effect of this type of business has taken away from the liveliness of downtowns as well as the free market economy American is based on. Despite these side effects, consumers everywhere are still caught in the vicious cycle of supporting these enterprises. Customers are also actually treated better by independent businesses because they provide diverse, well-crafted, high quality goods as a result of the connection to their consumer base. Supporting local corporations also gives back to the economy of the community because of the symbiotic relationship all businesses are a part of, as well as allowing for more originality and uniqueness in American neighborhoods. Addressing this problem makes us as employees, consumers, and citizens take responsibility and come to terms with the question: where do we wish to spend our money and who do we wish to support?

Poster # 454

The Pursuit of Ethical Interior Design for Autism Spectrum Disorder
Autism Spectrum Disorder is an increasing reality in the world, and this cannot be ignored. People with Autism Spectrum Disorder tend to have varying sensitivities and issues that affect their quality of life. If someone on the spectrum deals with visual sensory defensiveness, for example, a certain brightness of light or complementary colors creating a vibration may cause discomfort. Whether it’s a visual, auditory, or tactile defensiveness, all of these sensitivities need to be recognized when designing an interior environment if someone with Autism Spectrum Disorder may occupy that space. Interior architects also must design in a way that clearly defines the function of the room and spatially maps out the circulation of the space to eliminate strenuous and uncomfortable decision making for those with Autism Spectrum Disorder. By eliminating discomfort in those on the spectrum, interior architects are able to better the quality of life in these individuals. However, the nature of interior architecture is often defined by laws, money, and aesthetics. While all of these attributes have their importance, ethical design choices need to be better recognized, because interior architects will affect those occupying their design whether they recognize it or not. Therefore, lives need to be impacted in a way that universally increases the quality of life in individuals no matter their disabilities or differences. This research comes from multiple secondary sources as well as three interviews, and explores the complexity of designing interior environments for people with Autism Spectrum Disorder along with the lack of recognition of ethical design in the interior architecture community today.

Poster # 455

The Effectiveness of Gun Control

Viar, Nathan Joseph

Gun control is a topic of serious debate in the United States. With over 300 mass shootings taking place in the past year in this country, the issue of gun control certainly must be dealt with. The purpose of the present study is to determine if stricter gun control laws could have an adverse effect on several factors including gun violence, crime rates, and mass shootings. It was found that gun control laws such as concealed carry laws and background checks had no statistically significant effects on school shootings. In fact, in analyses of over 10 categories of crime, there is no statistical impact of gun control on crime rates. Also, higher rates of gun ownership generally produce lower murder rates. However, assault weapon bans have been proven to reduce the number of school shooting victims, but the average reduction in murder victims are less than 10 per year. These findings conclude that more strict gun control laws have little to no effect on crime. It is, however, significant that assault weapon bans help to reduce the number of school shooting victims. Hence, it is unclear whether tighter gun control laws will have any statistical impact on crime or murder rates.

Poster # 456

How Can the Agriculture Community Effectively Combat the Negative Influence of Social Media on Public Perception?

Viars, Hailey Rose

The United States Department of Agriculture defines farms as “any establishment generating $1,000 or more in agricultural product sales during the year,” and reports approximately 2% of our population
reported in 2012 to be operators or living on farms. Of the remaining 98%, approximately 72% of consumers don’t know much about ranching and farming according to the US Farmers and Ranchers Alliance. An agriculture illiterate consumer is defined as a person who does not understand and cannot communicate the source and value of agriculture as it affects our quality of life, by the National Agriculture in the Classroom organization. Lack of knowledge about agriculture is a concern for both consumers and producers. The Pew Research Center indicates 67% of Americans got some of their news on social media in 2017. Empirical evidence is presented that social media users can be inundated with misinformation and their perceptions against agriculture may be caused by the polarization created by algorithms of social media and confirmation bias. Suggestions are made based on the review of research and literature presented by agriculture professionals about effective communication strategies that should be considered by the agriculture community in an effort to counter negative perceptions by the public.

Poster # 457

The Effects of Biodiversity on Ecosystem Health and the Global Implications of Biodiversity Loss

Wade, Bryce

A Classroom Project for English 298

The fate of the world as we know it is at a crossroads. With humans’ continued habitat destruction, overharvesting, and lack of response to environmental change, our planet will continue to lose its biodiversity at an unprecedented rate. Many scientists are even dubbing the present day as a “mass extinction”: a period of biodiversity loss that has only been seen 5 times over the course of the earth’s history. Through expert interviews and secondary source analysis I investigated the influence biodiversity has in regards to global ecosystem heath and attempted to gain knowledge on the effect of biodiversity loss on the individual ecosystem level. I also investigated what real global implications that a 6th mass extinction will have on the environment and on the human race. Through my study I hope to assist people in understanding the concept of biodiversity loss and help provide insight on the tangible impacts it could have on their lives and the lives of people all over the world.

Poster # 458

Concussion and Football: The Deteriorating Mind

Wallace, Thomas Graham

A Classroom Project for English 298

A concussion is bruising to the brain caused by impact to the head. The head trauma can cause major short-term and long-term effects to the victim. Concussions have become an extremely large issue recently and have only become relevant within the last 20 years, due to lack of medical understanding before that point. The most recent publicity has come as ex-NFL players attempt to sue NFL executives over the head injuries they sustained while playing and the long-term effects suffered from those injuries. The concussion issue has now become a cause for concern even at the youth level, where kids and teenagers with undeveloped brains are receiving similar head trauma, and doctors are recommending children stop playing the sport. This essay examines information gained from secondary source literature along with qualitative research from people who have experienced concussions and professionals who have dealt with a number of cases. I conclude that despite the negative medical consequences and publicity surrounding the sport, there has been no significant change in participation due to lack of education on concussions and many people’s deeply rooted love for the sport. [ABSTRACT FROM AUTHOR]
Poster # 459

A healthy diet in a world of ultra-processed foods

Waller, Josephine

A Classroom Project for English 298

Faculty Mentor: Barrow, Robin

Today, many foods are considered to be "ultra-processed," meaning that they lack many of the necessary nutrients of a healthy diet. As marketing techniques have stressed labels such as "low calorie" and "nonfat," the perceptions of consumers have wandered far from the truth of the components of a truly healthy diet. What truly is a healthy diet? How did our perceptions stray so far from the truth? Is there hope for the future of healthy eating across the world? My classroom project for English 298 is a compilation of interviews and secondary research on the nutritional needs of the average adult, the components of ultra-processed foods, and current marketing strategies within the food industry that have led to current public misconceptions. The hope of the project is to dissect and encourage awareness of a healthy diet in a processing society.

Poster # 460

The Perception of Credibility on Twitter: A Qualitative Study

Walsh, Alexis R

A Classroom Project for English 298

Faculty Mentor: Brouwers, Marcel

Due to the rise of social media, information can reach audiences in less time than it previously could. While Facebook is a form of social media where news can be shared quickly, the use of Facebook by teens has declined and some teens, referred to as “Facebook nevers” by USA Today technology writer Jessica Guynn, do not use this platform of social media at all. Young people encounter this sharing of information of real and fake news every day, instead, on Twitter. This study aims to uncover the reasoning behind why honors students at the University of Tennessee Knoxville share news on Twitter based upon their perception of the credibility of other Twitter users: whether it be based on verification, fame, or popularity. After doing initial background research that focused largely on celebrities and news on Twitter, a survey was conducted during which honors college students answered questions regarding their decision-making process when choosing whether or not to retweet a tweet. It is expected that college students will find celebrities and other verified Twitter users more credible, and therefore, retweet their accounts more often.

Poster # 461

The Axis Shifts: An Analysis of Evolving Opinion of the Nazi Regime Following World War II

Warrington, Kaleb J

A Classroom Project for English 298

Faculty Mentor: McCue, Kristina

The paper analyzes the change in public opinion on the Nazi regime from the beginning of world war II to modern day. Previous commentators have analyzed public opinion but lacked a comparison between modern and contemporary ideas. By comparing the viewpoints of contemporary writers and modern writers it is possible to gain a better understanding of the shift in opinion of the world's population in relation to the Nazi party. Leading up to the war there was widespread German support for the Nazi party because of propaganda, financial stress, and psychological stress in the wake of world war I (Naumann, Pendas). Analysis of the sources shows a drastic change in German citizens opinion of the Nazi regime.
From widespread support to almost universal hatred. Other states such as the Russians have taken longer to “forgive” Germany for the horrors of World War II. Other modern writers have seen the value in some of the experiments the Nazis conducted such as several experiments targeting LGBT individuals in Germany (Robertson, et al). It is hoped that this analysis will provide greater insight into the shift in public opinion in regards to the Nazi party as time progresses from World War II.

Poster # 462

Assisting Social Success: The Psychosocial Impact of Assistive Technology Use Among Postsecondary Students with Disabilities

Waters, Erica Lindsey

A Classroom Project for English 298

The transition to postsecondary education is an important stage in any young person’s life, but for young adults with disabilities, this period is often defined by significant barriers to psychosocial development. Assistive technology has been shown to mitigate these obstacles and increase independence, self-esteem, and social participation among postsecondary students with disabilities. Despite the academic and psychosocial benefits of assistive technology, many students are reluctant to use it. Social stigmas about disability, fear of embarrassment, and a desire to blend in prevent students from fully utilizing the resources available to them. This project examines the benefits and barriers of assistive technology use among individuals with disabilities in postsecondary education and offers an overview of the psychosocial impact that assistive technology can have on these individuals. The findings of this project support that assistive technology can have significant positive effects on the psychosocial development of postsecondary students with disabilities, but its use remains limited due to social barriers. Improved education about disability is required to decrease social barriers to assistive technology so that individuals with disabilities can experience the psychosocial benefits of assistive technology without being stigmatized.

Poster # 463

Ancestry and Prosperity: The Effects of Ancestral Socioeconomic Status on Future Generation

Watts, Douglas Scott

A Classroom Project for English 298

Faculty Mentor: McCue, Kristina

A commonly sought goal of the human race has been to achieve elevated socioeconomic status, and, moreover, to predict an individual’s likelihood of economic prosperity. According to several sociological projects that have found remarkable similarities between each generation’s socioeconomic status, the question lies within determining what causes the level of socioeconomic success to remain relatively unchanged throughout generations of a family. The only way to answer this question was to examine research that has analyzed connections and correlations the persist through generations with regard to the factors that most influence socioeconomic success. In previous studies, multiple cross-culture analyses of influential factors including educational attainment, monetary status, familial relations, religious affiliation, exposure to violence, and racial discrimination have shown which of these factors, when applied to previous generations, have most impacted the current generation. While it is not entirely conclusive, the evidence and trends have indicated that strong division between ethnic groups and lower levels of educational attainment play the largest roles in ancestral influence on current socioeconomic standing (Massey & Bitterman, 1985). The results suggest that individuals with ancestors in the lowest socioeconomic levels typically do not end up much higher or lower in socioeconomic status themselves. Since that
is the case, current research concludes that socioeconomic levels of previous generations serve as strong indicators for the success of future generations; however, all these conclusions have been drawn based on sociological aspects, and more research needs to be done from a biological view to determine if genetics also play a role.

Poster # 464
The Psychology of Women in STEM
Weas, Madelynn
A Classroom Project for English 298

Women are the minority in STEM (science, technology, engineering, and mathematics) fields primarily due to psychological issues that stem from gender bias and stereotyping. These negative psychological impacts include decreased mathematics potential, grades (due to field-specific ability beliefs), cognitive strength, and cognitive ability. Their early environment, home life, and experiences can affect their choice in career even before they are heavily exposed to this bias. After pursuing a career or secondary education, women experience this bias on a daily basis. These biases occur with women and men, but psychological studies have found that men experience only a fraction of the negative effects that women experience when they are exposed to these stereotypes and biases. In order for women to overcome the effects of stereotyping and bias, they must retain a positive, goal-oriented mindset focused on their future and what they plan to do with their careers, and they cannot become affected by the negative mindset of those around them. Even in their later careers though, gender stereotyping affects women through underrepresentation in senior leadership positions and the field itself. Through the acknowledgement of gender biases and stereotyping, they continue to be pervasive throughout STEM fields, and only through their removal will women and men be able to work equally together.

Poster # 465
The Future of the Space Industry
Weatherly, Caleb Evan
A Classroom Project for English 298

With the recent success of companies such as SpaceX, research in space is becoming as talked about as it was in the Apollo era. Many of our most valuable current technologies include the predecessors of devices developed for the space race or communications networks made possible by satellites in space, making the space industry as integral today as it was in the Apollo era. Unlike the 1960s, however, private sector participation has raised new questions of the role of government versus businesses in the space industry. Through personal interviews and research, I have concluded that both the private and public sector could have their own niches in astronautics, complementing one another and creating a more efficient and driven market. The competitiveness of the private sector coupled with regulations by the federal government to encourage collaboration and the flow of information would create a system that allows new ideas to flourish and make space travel a more feasible and economical venture. The private sector’s taking of a larger role in astronautics also frees up some of NASA’s resources and allows them to focus on more specific missions while saving taxpayers’ money. Although it may be difficult to convince those in both the private and public sector to work together in this fashion, I believe full cooperation is by far the best way to improve the space industry.
Poster # 466

Cancer Treatment: A Reevaluation of Chemotherapy and Alternatives.

Weeks, Anna Elizabeth

A Classroom Project for English 298                      Faculty Mentor: Dean, Lance M

Over the course of almost seventy years now, chemotherapy has become a reliable solution for treating cancer patients. Although chemotherapy has proven itself to be highly successful, it still induces many significant side effects that can make treatment difficult. Considering these circumstances, new research suggests there could be promising alternatives to the traditional chemotherapy treatment that can deliver effective results without being as invasive as chemotherapy. This paper reevaluates the advantages and disadvantages of chemotherapy, along with new, upcoming solutions including immunotherapy, metronomic chemotherapy, and proton therapy, in order to consider the options for cancer treatment so that we may treat cancer patients in both an effective and ethically appropriate way. This is done through the review of literature and research, as well as the interview of a proton therapy doctor, an oncology nurse specialist, and a cancer survivor. This paper examines the current options and alternatives concerning cancer treatment so that those facing cancer treatment may better evaluate their options.

Poster # 467

To Build the Wall or not to Build the Wall: College Catholics Perspectives on Immigration

Weiland, Sean Christopher

A Classroom Project for English 298                      Faculty Mentor: Nicks, Robin Jean Gray

Due to several wars around the world many countries are experiencing an unprecedented influx of immigrants and refugees. This sudden spike in immigration has drawn a variety of responses from every political party and religious organization in the world. Research conducted in Europe and the United States suggests that adult Catholics are split roughly down the middle when it comes to being pro/anti-immigration. In fact, according to a 2006 study conducted by the Pew Research Center Study, 50% of Christians advocate strict immigration policies. That statistic is surprising because most Christian denominations have adopted very pro-immigration stances. This study is particularly relevant because little to no research has been conducted on college-age Catholics, which will be a major voting bloc in future elections. The aim of this study is to understand why the discrepancy between official Church doctrine and actual practitioners beliefs exists, but it will narrow down the focus to just college-age Catholics. During structured interviews, four participants shared their opinions on America’s immigration system, and explain why those differ or align with the Church’s official teaching on immigration. The information gained in this study will help illuminate what up and coming Americans believe should be done in our country; such information could potentially shape future elections.

Poster # 468

False Cancer Research

Wenger, Derek

A Classroom Project for English 298                      Faculty Mentor: Brouwers, Marcel

In recent years, lies have been published online in various forms. One of the most detrimental forms of fake publishing has occurred worldwide surrounding cancer research. Countless studies, articles, newspapers, and statements have been
published online by credible, peer-reviewed journals and articles that have later been proven to be manipulated or entirely false. The purpose of this research project was to find and display evidence of these lies and evaluate how much people trust the sources that are considered “credible”. The ways in which this information was collected was through researching different examples of falsified cancer research and by collecting data from a survey asking peoples’ opinions about their trust in what they read and hear about cancer research. The examples found on the internet about different studies and publishing that have been proven false have demonstrated that in the last 15 years, this issue has become more severe. One of the main causes for this is possibly the lack of verification that goes into publishing online. Data from the survey results displayed the abundant trust the public has for these sources, which is why presenting the large amounts of false information on these sources is such a serious issue.

Poster # 469

Evaluating the Presence of a Home Advantage in the Olympics: It’s Not Definite.

White, Logan Patrick

A Classroom Project for English 298

Faculty Mentor: Murphy, Samantha Ann

In the world of sports, being the home team during a competition has always come with an implied advantage whether it is having a larger crowd, playing on your home turf, or some other factor that seemingly gives the home team a competitive edge. Because the Olympics are some of the largest sporting competitions in the world, they too are believed to harbor the home team advantage as the host country should have the largest opportunity to create unfair circumstances. There have been many analyses of past Olympics that support the existence of the home team advantage. However, a careful look into the methods of these researchers shows that careless assumptions, such as assuming that any country’s improvement during a home Olympics was due to an unfair advantage or failing to consider the how different countries effect medal distributions, were made. By making more educated assumptions and evaluating the major individual components of the home team advantage including judging bias and the familiarity advantage, my research shows that there is no definite competitive advantage for the host country in the Olympics, and further research must be done to determine if a home team advantage was present at any given Olympics.

Poster # 470

In or Out: Student Perceptions of Domestic and Imported Goods

Whitus, Andrew Ray

A Classroom Project for English 298

Faculty Mentor: Nicks, Robin Jean Gray

Amidst changing social perceptions and political climates in the United States, it is valuable to explore concepts of ethnocentrism and how a younger generation exemplifies it through purchasing decisions. There is little American research on this topic in recent years, so new data brings more modern views into the discussion. How participants discuss other countries and insights into their decision-making processes are explored. Research was conducted by interviewing a set of three first-year undergraduate male students at the University of Tennessee who were raised in the United States with varying family cultural backgrounds. Interview responses were analyzed and compared to gain understanding of any differences or similarities in responses and how they relate to the topic at hand. Conclusions were drawn demonstrating ways in which students with varying backgrounds make purchasing decisions. These conclusions point to future research with larger samples with more varied subjects.
Induced Pluripotent Stem Cell Research: An Ethical Alternative to Embryotic Stem Cell Research

Widener, Cierra H

A Classroom Project for English 298

The purpose of this essay is to respond to the ongoing scholarly debate over the ethics of embryonic stem cell (ESC) research with a potential alternative approach of research using induced pluripotent stem cells (IPSC). ESC research is proposed to have benefits that could affect the human population tremendously in the treatment of varying medical conditions, however, the destruction of a fetus is required to obtain the cells needed. The moral dilemma has caused great controversy in the medical research field, leading to the discovery of IPSCs. According to research, IPSCs have been found to be as equally relevant to the advancement of the medical field as ESCs. Studies conducted by scholars have concluded that IPSCs can be an aide in modeling various diseases, solving problems surrounding tissue degeneration due to disease, and evaluating the toxicity of newly created pharmaceutical drugs. Based on these studies, IPSC research shows potential in solving a wide array of problems presented within the medical community, and unlike ESC research, the cells are obtained from an adult without causing harm. If the use of IPSC research advanced, it could eliminate not only the need for ESC research, but also the ethical concerns presented.

The Effects of Widespread DNA Sequencing on Data Privacy and Personal Freedoms

Wildgruber, Max Christoph

A Classroom Project for English 298

Ready access to personal DNA sequencing and steadily growing DNA databanks carry unique challenges that must be addressed. Dated policy regarding genetic research practice and ethics does not effectively address questions regarding authenticity, confidentiality and scalability. Several studies and surveys were examined to evaluate the current state of genetic research policy, so that effective policy changes could be proposed. Research thus far has focused on standardization and repeatability, which are the primary issues with the current DNA databanking system. Policy changes have been proposed that focused on unifying practice and principle. These flaws draw attention to the limited utility of laws written prior to the information age in cases involving technologies that were not anticipated at the time. These gaps in legislation have resulted in less effective management of potentially hazardous technologies, and the potential social repercussions of these gaps were the primary focus of this research.

The Categorizing Effect of Genetic Testing on Racial Attitudes in the United States

Wildmann, Ashton Elise

A Classroom Project for English 298

As genealogy becomes more popular in a world that is constantly becoming more genetically diverse, it has the power to strengthen or weaken racism depending on how its users interpret the knowledge it provides. In the past, genealogy has served as a tool for justifying racism, such as during the Holocaust. Past studies have concluded that because the number of people marrying interracially is increasing in America, the American population is steadily appearing less different,
therefore it has become more difficult to segregate based on appearance. Carter, R. (2007) speculates that genetic testing may add more fuel to current race-based prejudices, consequently not blurring the lines of race but bolding them. Due to the medical advances that were made by studying the connection between genetics and medical trends, race has become an even more significant part of the field of genetic research and genealogy. As genetic testing becomes more popular and the ability to uncover complex connections between people and populations all over the world develops, the knowledge of ethnic backgrounds and socioeconomic connections may cause Americans to become more aware of the way some are treated for their physical differences. The current study concludes that though genealogical and genomic research provides incentive for the continuation of distinction due to genetic race, racism is based on cultural differences rather than genetic so that research should not cause racial attitudes to become more hostile.

Poster # 474

Knowing When to Stop: Understanding the Reasons to End United States Involvement in Honduran Politics

Williams, Andrew M
A Classroom Project for English 298
Faculty Mentor: Gentry, Elizabeth Leigh

Honduras has been troubled by political instability and illegal drug trade for nearly a century, leading to a poor economy and a weak government. Furthermore, both past and current attempts at intervention by the United States government have been unsuccessful in their goal of solving the problems in Honduras. This analysis of the current and historical data concerning foreign affairs and economics adds a new perspective to this ongoing debate by offering a more uncommon solution than would typically be expected. By compiling research and reports from different academic sources, the paper concludes that foreign affairs in Honduras will be detrimental should they be continued. The proposal this paper makes is that the most logical course of action is for the United States government to fulfill all promises made to Honduras and then slow the funding and programs until involvement has ceased.

Poster # 475

The Death of Cinema: An Examination of the Rise in Formulaic Films and the Decline of Art-house

Williams, Marc Robert
A Classroom Project for English 298
Faculty Mentor: Murphy, Samantha Ann

Over the last forty years, the film industry has struggled to maintain the relevance of theatrical releases due to the rise in home media. The development and expansion of technologies such as the VHS and the DVD have caused strategic shifts in filmmaking at the studio level. The result of this has been an intense rise in films based around formulae with proven structural, character, and thematic elements. This change has been intensively studied by film historians. However, common research in this field often shies from the direct consequences of these changes. My research builds upon this, focusing on the formulaic filmmaking’s effects on independent/art-house films, independent theaters, and low-budget filmmaking. By drawing comparisons between financially successful blockbusters and contrasting them with smaller budgeted films, this project finds correlations between studio motivations, critical response, and commercial success. Additionally, it charts the decline of independent cinema in relation to studios, the attitude of the public, and the change in film as a form of artistic expression to a spectacle-focused experience. The strategic adjustments made by film studios has directly contributed to downfall of film as an artform and the destruction of an industry of independent filmmaking.
Poster # 476

America's (Fast) Time

Wilson, Greyson Timothy

A Classroom Project for English 298

Faculty Mentor: Newburn, Harry Fredrick

Major League Baseball has been “America’s Past Time” for the better part of 150 years. However, it has recently battled a new wave of rule changes that have put the time frame of the game in perspective. The game that, even today, has millions of fans is now facing its judgement day for the lack of it being a timed sport. Major League Baseball has instigated serious talks on speeding up the ‘pace-of-game’, but what they have overlooked is that they are in fact contributing to more injuries and longer game times through its lack of data utilization. Recent additions such as replay, an extremely controversial addition in its time, as well as Major League Baseball’s affection with offense has only combined to make changes such as the pitch clock a patch to a deeper cut. Through research and interviews conducted with a statistician and lifelong experts on the sport, it can be reconciled that baseball is failing at their approach to the changes in the game. The front office of baseball seems to be stating one change while conveniently ignoring the consequences of the changes to the game. If these variables do not change in the foreseeable future, the leadership of baseball will drive the sport into the ground.

Poster # 477

Cannabis Comes out of the Closet: Revealing the Opinions of College Students and Professors about the Effects of Marijuana

Wolfe, Cortney Amber

A Classroom Project for English 298

Faculty Mentor: Nicks, Robin Jean Gray

Despite the vast research done on the effects of marijuana usage on young adults, little is known about the opinions of marijuana usage among both college students and college professors. This study examines the opinions of UTK undergraduate college students regarding the usage and effects of marijuana, and it compares and contrasts such opinions to those of graduate students at UTK who are instructing their own courses. Additionally, the opinions from both groups are compared to scientific data found from secondary research sources that study the physical and psychological effects of marijuana on young adults. I interviewed three college students with past and/or current experience with marijuana and asked for their opinions, beliefs, and personal experience regarding marijuana. I then interviewed two graduate students, who are instructing their own courses, asking the same questions with more focus on opinion than experience. The results shed light on the common opinions of marijuana on college campuses, the actual immediate and long-term effects of marijuana, and how popular opinion among college campuses may differ or compare with science. These findings can be used to create awareness among college campuses about marijuana usage and help individuals determine whether or not their perceptions of marijuana are valid.

Poster # 478

The Power of Music

Woltman, Mikayla Ann

A Classroom Project for English 298

Faculty Mentor: Addicott, Randi Marie
Whether it’s for relieving pain, coping with grief, bringing people together, improving memory loss in the elderly, recovering motor skills in stroke patients, or improving athletic performance – music really is the best medicine there is.

Even though music therapy itself is something specific that requires a certified music therapist, just listening to music or learning a musical instrument can still have numerous benefits. There are people who believe that music is a distraction from the pain, but studies have been done that prove there is more going on than just slowing the heartbeat to relax and distract. A good song also has the power to bring people together and music is a great way to regulate mood both before and during physical activity. When used correctly in music therapy, music also has the power to heal and help people cope and deal with their grief. Even though music therapy is thought to be a placebo, the numerous cases that support the benefits of it speak for themselves. It doesn’t really matter why or how, it just matters that music can help people in ways that modern medicine can’t.

Poster # 479

Pain Management in Neonates: Increasing the use of Non-Pharmaceuticals in Order to Decrease the Use of Pharmaceuticals and its Consequences

Woods, Madison Marie

A Classroom Project for English 298

Faculty Mentor: Murphy, Samantha Ann

During the 20th century, many procedures done on neonates, or newborn children, were done without the use of pain management. Many signs of pain, like crying, were disregarded as reflex. This theory deflated in the 21st century as more parents became concerned with the well-being over their baby. However, this brought up another challenge concerning neonatal pain: how do we access neonatal pain and what is the most effective way to manage it? Since newborn infants are not able to communicate, physicians must come up with a universal assessment in order to appropriately manage the pain. Debate over the use of pharmaceuticals versus non-pharmaceuticals has also become significant in the 21st century. Pharmaceuticals include the use of opioids and other drugs on children and non-pharmaceuticals include facilitated tucking, massaging, and acupuncture. While prescription medicine can be fast-acting, there are other consequences that make drugs usage, which is why parents and doctors should increase their use of non-pharmaceuticals and decrease drug infusions in order to decrease the safety risk. By explaining the risks different types of pharmaceuticals have on neonates, we can conclude the most effective way to treat pain in neonates is by combining both non-pharmaceuticals and pharmaceuticals.

Poster # 480

Science and the Machiavellian Principle: Does the End Justify the Means?

Wright, Hannah Elizabeth

A Classroom Project for English 298

Faculty Mentor: Addicott, Randi Marie

The same curiosity that sparked humans’ interest in the surrounding world has also lead to poor ethical conduct in scientific research in the past. However, researchers should never have to forego scientific advancement for a moral compass, especially with the technological progress that modern science has made. By chronologically analyzing the Tuskegee Syphilis Study, the Hitler Eugenics program, the case of Henrietta Lacks, and embryonic stem cell research, I will exhibit the development of bioethics over time and portray how bioethics could have improved each situation, while still accomplishing the scientific advancement.

Keywords: bioethics, stem cell research, scientific advancement
Poster # 481
Navigating the Approaches to Weight Loss
Wyatt, Sydney Elise
A Classroom Project for English 298 Faculty Mentor: Barrow, Robin

Approximately 36% of Americans are obese, and more than 34% are overweight (U.S. HHS, 2017). An even more alarming statistic states that nearly 32% of children and adults are overweight and obese (National Institutes of Health, 2016). Due to this continuing weight problem, there are a considerable amount of diets available to the public, and many of them claim to be the “best way to lose weight.” Yet, a large percentage of dieting plans yield exponential weight regain rates. This study aims to answer the questions: how can an individual find an effective weight loss method, and what factors should be considered when doing so? I have sought to determine these answers by analyzing multiple articles, peer-reviewed journals, and studies relating to the many methods of weight loss. I have also interviewed two professionals in the field. The three weight loss methods focused on in this project are commercialized diets, medical interventions, and lifestyle changes. The subsequent information evaluates the benefits and disadvantages of each of these methods.

Poster # 482
Use of Modern Archaeological Mapping Techniques to Improve Final Products
Yates, Grant Keith
A Classroom Project for English 298 Faculty Mentor: Gentry, Elizabeth Leigh

In an era where archaeological mappings of sophisticated areas are very much necessary but still difficult to accurately create and pay for, researchers have yet to find a clear answer as to the best method for balancing cost efficiency, labor intensity, and accuracy of mappings. Historically, archaeological mapping has been extremely expensive and required an abundance of human interaction. However, with many different modern methods emerging that incorporate technology and robotics more than ever before, the answer to society’s issue of creating accurate representations of the world around us includes a few modern methods used according to the type of terrain at hand. The two methods I am concerned with are stereo-vision photogrammetry for mapping submerged locations and airborne laser scanning for sites on land. When properly utilized, these modern techniques yield researchers with a higher resolution, more realistic mapping of the area, while keeping the cost at a minimum.

Poster # 483
Animal Welfare: Where do we draw the line?
Young, Erin Grace
A Classroom Project for English 298 Faculty Mentor: Nicks, Robin Jean Gray

Recent literature pertaining to animal welfare reviews science professionals’ opinions on the intelligence of certain species and how exactly their welfare should be preserved. While most literature does not advocate for the harming of animals, the common theme of human benefit outweighing an animal’s welfare is apparent. What previous research lacks is the opinions of a younger population that could immediately impact the future of animal welfare legislation. This study uses four qualitative interviews to gain insight on UTK students with non-science major’s attitudes towards animal welfare and
whether or not certain animals should be treated differently due to their intelligence or lack of. This study focuses on how students at UTK with a non-science major define ‘animal welfare’. Also, if and when they think an animal’s welfare should be jeopardized for human benefit. An in-depth analysis of the four interviews was conducted to find commonalities within the interview transcripts in order to make valid conclusions. The results found in this study are important to the future of animal welfare legislation within society and the science community.

Poster # 484

The Actions of Social Media Toward Preventing the Spread of Fake News

Young, Tyler Harrison

A Classroom Project for English 298

Faculty Mentor: Brouwers, Marcel

As the influence of social media continues to grow, the role of fake news on social media platforms must be examined. While fake news on social media is not a new issue, it became prominent in the 2016 presidential election. The substantial role it played in the election make it prudent to examine the reasons, methods, and influences of social media. What can the social media industry do to prevent the trend of fake news from influencing the views of others in the future? Social media platforms must examine how they can improve their algorithms to prevent malicious and falsified news stories from appearing while also enhancing how quickly they are able to identify, examine, and delete possible fake news stories. The results of this research will uncover the possible influence Russia had through social media on the 2016 Presidential Election, how often people viewed fake news on social media, and how fake news influenced the political views of others that consequently affected the 2016 presidential election. Using this information, the process of identifying fake news can be better understood and improved to ensure news is factual and beneficial to users. In conclusion, the exact effect fake news on social media sites had on the election results is not measurable; however, it is conclusive that voters obtained news and information through the avenue of social media that ultimately influenced their voting in the 2016 presidential election. The significance of this impact on society necessitates reform to social media’s method of preventing fake news.

Poster # 485

Can Artificial Intelligence Stop Online Fake News?

Zimmermann, Samantha Kennedy

A Classroom Project for English 298

Faculty Mentor: Brouwers, Marcel

Many Americans have high concerns that news distributed online is false, whether with intention to mislead or by accident. Attempted solutions have involved companies such as Google or Facebook hiring teams specifically to read and verify online content. This, however, is expensive, time-consuming, and limited in reach. A better solution is proposed in artificial intelligence. After an algorithm is developed successfully, AIs are cheap to maintain and operate very quickly. AI has outperformed humans in the past at other applications. However, modern learning systems are very limited, particularly in ways applicable to evaluating language, and AI is difficult to implement in practical applications.

Despite these, modern AI is good enough to provide a starting point. Current accuracy percentages are over ninety percent on average, and through qualitative research, an accuracy percentage for an average online user is determined to be around 70-80 percent. Although imperfect and challenging to implement, AI can alleviate strain on online readers, helping them make informed decisions about content consumed and shared with less time spent. Currently, AI cannot eliminate the fake news problem, but it serves as the next best step towards a solution.
Natural Sciences – College of Arts & Sciences

Poster # 486

**Dissection of a General Chloroplast Targeting Motif Using In Vivo Imaging of Transit Peptide-YFP Fusion Proteins in Plant Cells**

*Rena Zekaria Abdurehman*

Student’s Department: Biology  
Faculty Mentor: Bruce, Barry D

Rena Abdurehman, 1-2 Kristen Holbrook, 1Jessica Hendricks, 1Erika Sanders, & 1Barry D. Bruce 1Biochemistry and Cellular and Molecular Biology Department, University of Tennessee, Knoxville 2Current Address: Molecular Biology Institute, University of California, Los Angeles

Plastids are ubiquitous organelles found in all plant cells. Chloroplasts are found in green tissue and perform many diverse functions essential to the plant besides photosynthesis. The vast majority of chloroplast proteins are nuclear-encoded precursors and imported post-translationally into the chloroplast through membrane-localized translocons. This process is mediated via N-terminal extension known as transit peptide (TP) and despite discovery ~40 years ago, the TP function is still poorly understood. We are using in vivo targeting assays to explore a small sub-set of 7 TPs using a heuristic set of mutations. With these 7 preproteins, we applied 5 mutations and tested their targeting using three different in vivo methods: 1) biolistic transformation of onion/leek epidermal cells, 2) Agrobacterium-mediated pea protoplast transformation and 3) PEG-CaCl₂ transformation of isolate pea protoplasts. We report transformation efficiencies of 37 transformed cells/730x750mm tile with leeks, 40% with PEG-mediated transformations, and ~15% using Agrobacterium. Using YFP (yellow fluorescent protein) as a reporter, we have implemented a semi-quantitative method for measuring in vivo targeting activity of these heuristically-designed mutations based on sub-cellular fluorescence localization. To increase the rate of analysis we have explored using an automated digital Keyence microscope that rapidly stitches together many Z-stack images together.

Poster # 487

**Exploring the Development of an Orientation Assay for pH Dependent Insertion Peptides**

*Alayna Marie Cameron*

Student’s Department: BCMB  
Faculty Mentor: Barrera, Francisco

The peptide pHLIP (pH Low Insertion Peptide) is already known to more readily insert into cell membranes within a low pH environment; henceforth, making it an intriguing subject of research, particularly within cancer cell targeting research. For cancer cell membranes are intrinsically more acidic due to their increased usage of lactic acid fermentation. However, there is still much to be learned about pHLIP. While much is known about its response to various pHs, little is known about their direction of insertion. Within this review, we attempt to apply an orientation assay used previously for larger proteins in order to determine the directionality of pHLIP’s insertion, specifically mutant strain CCpHLIP (cysteine on the C-terminus). This information will contribute much to understanding how pHLIP might be used as a cancer cell targeting drug delivery system. Also, adapting this orientation assay for pHLIP will be helpful in characterizing other small peptides.
**Poster # 488**

**Computational Study of Ligand-dependent Oligomerization of Ribonucleotide Reductase**

*Bill Pham*

Student’s Department: Biological Science  
Faculty Mentor: Shen, Tongye

The state of protein oligomerization can be strongly influenced by its ligand-binding status. We constructed a new computational method of investigating how ligand-binding and oligomerization can be coupled. Instead of a direct study of the whole oligomer complex, which can be computationally expensive, we tackle this issue using an approximate approach of studying the properties of individual monomers. By connecting the dynamics of monomer properties and the information of oligomer interface, we quantify the synchronization of two types of contact dynamics: (1) between the ligand and its binding pocket, and (2) the interfacial contact dynamics between the monomers. In this work, we tested our methodology using the protein ribonucleotide reductase (RNR) as an example. RNR is a critical enzyme for the upstream process of synthesizing DNA bases. The study of RNR mechanism could lead to new designs of antimicrobial drugs targeting allosteric control of RNR function. We first performed atomistic simulation to monomers with different ligand binding status and then used statistical analysis to gather the contact dynamics. We then obtained the level of "resonance" between ligand binding and the interface formation (oligomerization) for various setups. We revealed new insights on RNR (de)activation mechanism via ligand-induced hexamerization (dATP vs. ATP) at the A-site (Activity allosteric site) and dimerization triggered by ligand association (dTTP) at the S-site (Specificity allosteric site).

**Poster # 489**

**Metabolic Activity of Arabidopsis Thaliana NIP2;1 and its Effects on Survivability Under Hypoxic Stress**

*Samantha Jean Mcintire*

Student’s Department: Biochem/Cellular/Molecular Bio  
Faculty Mentor: Roberts, Daniel M

NIPs are nodulin-intrinsic proteins that are specific to plants and involved in transport of water and other uncharged solutes. Arabidopsis thaliana consists of nine NIP genes.

In the current study, attention has been focused on NIP2;1 (NIP subgroup I), one of the representative Arabidopsis NIPs, in accordance with its cellular and subcellular localization, tissue, transport activity, and biological roles in Arabidopsis.

It has been shown in experiments that AtNIP2;1 is especially responsive to hypoxia-induced stress. Hypoxia is a condition in which most of the oxygen has been removed from an environment. In hypoxic environments, plants construct a specific mechanism to cooperate with hypoxic conditions, such as increasing glycolytic flux to provide ATP, increase of fermentation metabolism, and induction of morphological and developmental changes. A functional analysis of AtNIP2;1 has shown that AtNIP2;1 transports lactic acid, and may play a role in adaptation to fermentation of lactic acid under anaerobic stress.

In this study, it is shown that Arabidopsis thaliana NIP2;1 (AtNIP2;1) expression is explicitly stimulated through hypoxia. It is shown that knockout of NIP2;1 genes are susceptible to hypoxic treatment. In the survival assay experiment, NIP2;1 knockout plants had a significantly lower survival rate than the wild type plants. A metabolic analysis was performed on both the wild type and knockout lines after hypoxia.
Poster # 490

**Overexpression of THIOGLUCOSIDE GLUCOHYDROLASE 1 (TGG1) affects intercellular trafficking in Arabidopsis thaliana**

*Alessandro Francesco Sarno*

Student’s Department: Kinesiology

Faculty Mentor: Burch-Smith, Tessa Maureen

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Plasmodesmata (PD) are pores that traverse plant cell walls, providing a route for intercellular trafficking of essential metabolites, nutrients, and signaling molecules between adjacent plant cells, thereby aiding communication. The increased size exclusion limit 2 (ise2) mutant of Arabidopsis thaliana has an increased abundance of branched PD, as well as a greater flux of intercellular trafficking. A search for proteins that interact with ISE2 identified THIOGLUCOSIDE GLUCOHYDROLASE 2 (a myrosinase). A. thaliana also encodes a second, closely-related myrosinase, TGG1. Myrosinases are enzymes that catalyze the hydrolysis of glucosinolates, a type of secondary metabolite that are amino acid derivatives. The breakdown of glucosinolates by myrosinases and related enzymes produces isothiocyanates, toxic compounds important for plant defense. While ISE2 and TGG2 interact, the effects of this interaction are unclear, and understanding this relationship was the goal of this study. We measured intercellular trafficking of green fluorescent protein (GFP) in plants with constitutive strong expression of TGG1. Intercellular trafficking decreased in plants with increased TGG1 expression. This result suggests that TGG1, and probably its substrates or products, could have important roles in controlling intercellular trafficking via PD. We will also explore how this decrease in intercellular trafficking affects plant defense.

Poster # 491

**The effect of osmolytes on ligand binding to dihydropteroate synthase**

*Ojaswini Sharma*

Student’s Department: Interdisciplinary Studies

Faculty Mentor: Howell, Liz

Folic Acid, or Vitamin B9, is involved in one carbon transfer metabolism and is required for the synthesis of important amino acids and nucleotide precursors. Therefore, if there are any defects in the enzymes that are involved in its metabolism, birth defects and cardiovascular diseases can result. Humans cannot synthesize folic acid on their own; thus, it is acquired via dietary supplements. In contrast, bacteria can synthesize folic acid. This unique feature allows drug targeting of the bacterial folate synthesis enzymes using, for example, sulfa drugs. Dihydropteroate synthase (DHPS) is one of the enzymes in the folate acid synthesis pathway in bacteria. DHPS catalyzes the reaction of 6-hydroxymethyl-7,8-dihydropterin pyrophosphate (DHPH) with para-aminobenzoic acid (pABA) to form dihydropteroate and pyrophosphate. This is an ordered reaction with DHPH binding to the enzyme first, which then allows pABA to bind.

Folate is comprised of a pteridine ring, a pABA ring, and a glutamate tail. Previous studies in our lab have shown that osmolytes weakly interact with folate at particular atoms, which are compounds that maintains the cell’s volume and fluid balance. For example, the pteridine ring of folate prefers to interact with the osmolyte betaine while the glutamate tail of folate prefers to interact with water. When attempting to remove osmolytes from the ligand, it is more difficult to remove them compared to water molecules. This results in a weaker association of folate to the enzyme. We predict that osmolytes will weakly interact with DHPH and pABA and prevent them from associating with the DHPS enzyme. Further studies conducted in our lab have identified trehalose as an osmolyte that will preferentially interact with DHPH, whereas
betaine will preferentially exclude it. We have conducted Isothermal Titration Calorimetry (ITC) and fluorescence experiments to measure the binding affinity of DHPP to DHPS. Furthermore, we have explored the effects of osmolytes and observed that trehalose weakens the association of DHPP to DHPS; whereas, betaine strengthens the association. Future studies will be conducted to understand the binding affinity of pABA using these techniques. This will be followed by studying the effect of osmolytes on pABA binding to DHPS. We predict that both trehalose and betaine will weaken the association of pABA to the enzyme.

**Poster # 492**

**GCN2-mediated stress response in nitrogen starved Arabidopsis seedlings**

*Charles Caiman Barnes*

Student’s Department: Biology  
Faculty Mentor: Vonarnim, Albrecht G

Nitrogen is an essential nutrient for plant growth, but response to fluctuations in soil nitrogen is not well understood. Eukaryotes have evolved mechanisms to regulate protein synthesis in response to adverse environmental conditions, but regulation in plants is particularly interesting because they are sessile. Plant GCN2, a protein kinase specific to eIF2α, is active during certain stress conditions including wounding, herbicide treatment, oxidative stress, UV light, and amino acid deprivation. This project focuses on GCN2 mediated translational control in Arabidopsis in response to changing inorganic nitrogen (Nᵢ) availability in the growth medium. We hypothesize that eIF2α will be phosphorylated when Nᵢ is reduced, owing to decreased nitrogen assimilation and less amino acids available for tRNA charging. However, we did not observe eIF2α phosphorylation when transplanting seedlings from normal Nᵢ to starving Nᵢ. In contrast, transplanting seedlings from starving Nᵢ to normal Nᵢ reliably resulted in eIF2α phosphorylation, the earliest response being within three hours. Sucrose alters the eIF2α phosphorylation response under nitrogen shift. Also, there appears to be a differential response between the shoot and the root of the seedling. The results show that introducing Nᵢ to nitrogen starved plants causes a global stress response that leads to altered protein translation. So far, phenotypic studies have been inconclusive in elucidating the effects of this nitrogen-shift response on plant development. Interestingly, the phosphorylation of another component of the translation apparatus, ribosomal protein eS6, was in direct opposition to that of eIF2. Given that a kinase targeting eS6, TOR, is generally thought to be activated when energy and fixed carbon are abundant, the coordinated but reciprocal regulation of the two phosphorylation events may be related to an imbalance in the C:N ratio. Therefore, it is now attractive to test whether the GCN2 kinase may play a role in rebalancing root growth and leaf development in response to changes in the C:N ratio.

**Poster # 493**

**Using Host Serum IgG Titers to Estimate Toxoplasma gondii Virulence**

*Riley E Byrd*

Student’s Department: Microbiology  
Faculty Mentor: Su, Chunlei

Toxoplasma gondii is a protozoan parasite that causes the disease toxoplasmosis in animals and humans. This parasite has two infectious forms: oocysts shed in the feces of felids (domestic and wild cats), and tissue cysts from chronically infected
animals. Humans may become infected via the ingestion of food or water contaminated with oocysts, the consumption of tissue cysts in undercooked meats, or vertical transmission from the mother to the fetus. Previous studies have found that T. gondii strains from South America are genetically diverse and tend to be more virulent and causing more severe diseases in infected hosts than strains from elsewhere. We hypothesize that more virulent T. gondii strains can induce a stronger immune response to chronic infection than less virulent strains resulting in higher IgG antibody levels in the hosts. If true, we would expect higher IgG levels in the serum of animals and humans from South America than elsewhere. To test this hypothesis, we used the modified agglutination test (MAT) to measure anti-T. gondii IgG levels in serum samples from animal hosts (cats & dogs) from South America and elsewhere. The IgG titers were then compared to determine if IgG level can be used as a marker to predict parasite virulence at the population level.

Poster # 494

Characterizing nuclear localization of the core hypoxia response protein CALMODULIN LIKE 38 during hypoxia and recovery

Nancy Carol Gulledge

Student’s Department: Biochem/Cellular/Molecular Bio

Faculty Mentor: Roberts, Daniel M

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Plants encounter a severe low oxygen (hypoxia) stress state under conditions of submergence or poor soil aeration due to decreased respiration and accompanying energy crisis. Plants adapt to hypoxia by conserving energy through suppression of the translation of non-essential mRNA transcripts. These non-essential transcripts are routed to cytosolic messenger ribonucleoprotein (mRNP) structures, including stress granules (where mRNA is sequestered) or to processing bodies (where mRNA is degraded). Arabidopsis thaliana CALMODULIN-LIKE 38 (CML38) is a calcium sensor protein, and is among the 49 core hypoxia genes induced during prolonged hypoxia stress. Null alleles of CML38 (CML38KO) show a decreased survival under conditions of argon-induced hypoxia, suggesting a critical role for CML38 as a target for calcium signals during the adaptive response. CML38KO plants have increased root cell death compared to wildtype during prolonged hypoxia and short term recovery, suggesting a role integral to cell homeostasis during hypoxia survival.

In addition to its trafficking to cytosolic mRNP particles, previous data has also demonstrated that CML38 associates with several mRNA splicing factors that localize to the nucleus, suggesting an additional role for CML38 in the nucleus. My hypothesis is that CML38 localizes to the nucleus during prolonged hypoxia, and that CML38 localizes to the nucleus through the nuclear localization signal in the N-terminal region of CML38. Preliminary data suggests that the N-terminal domain of CML38 is needed for nuclear localization. Additionally, in silico prediction of the N-terminus identified a nuclear localization signal (NLS). Current work is focusing on characterizing when CML38 is localizing to the nucleus during hypoxia and recovery through fluorescence microscopy of Arabidopsis seedlings that express a translational fusion of enhanced Yellow Fluorescence Protein (eYFP) and CML38. Additionally, the role of the N-terminus is being investigated by comparing the localization of plant cells co-expressing an N-terminal truncation of CML38-CFP and full-length CML38-YFP during hypoxia and recovery. This data will be useful to tease apart the complex roles of CML38 during flooding and understand if it has distinct roles in the nucleus and cytoplasm and how these are affected by the stress state of the cell.
Creating micro-RNA Hairpin Loops to silence disconnected(disco) gene in Drosophila Melanogaster

Bhavya Asheshbhai Parikh

In the past, it has been reported that mutations in the disconnected (disco) gene severely affect the optical lobes of D. Melanogaster. Moreover, they also lack the ventral lateral neurons (LNVs) that serve to create a proper and functioning biological clock. Hence, here we have employed a microRNA-based silencing of disco mRNA (miDisco). It is yet to be seen if post-transcriptional silencing of miDisco mRNA has a similar effect to disco mutants. Therefore, two miDisco DNA constructs were created using polymerase chain reactions (PCR), each targeting different regions of disco mRNA. These constructs were further integrated into the genome of drosophila via germ-line transformation to generate transgenic UAS-mi-Disco lines. After establishing these fly lines, they will be crossed to various Clock-specific gal4 drivers to see the effect of miDisco on the LNVs.

Preparing for Genomic Binding Studies of a Transcription Factor in Liver Cancer Cells

Thomas Isaac Raines, Trevor F Freeman

The constitutive androstane receptor (CAR) is a nuclear receptor protein that functions as a transcription factor after forming heterodimers with the retinoid X receptor (RXR). CAR’s activity changes in response to the binding of various small molecules and has been implicated in several human diseases, including type II diabetes, liver cancer, and acetaminophen-induced liver toxicity. We think CAR is a potential novel drug target, but there is a need to better understand the effects of small molecules on its activity. Our end goal is to elucidate the effects of different small molecules on CAR’s genomic binding positions by chromatin precipitation and sequencing (ChIP-seq).

Here, we present the optimization of our experimental protocols in preparation for the ChIP-seq experiments. We explore the changes in the growth and morphology of hepatocarcinoma cells on different surfaces. One major challenge we face is to ensure that both CAR and RXR proteins are expressed in our cells. This cell line is notoriously difficult to transfect, so we have pursued a variety of options to artificially express tagged proteins in these cells.

Role of Translationally Controlled Tumor Protein in Intercellular Communication

Jacqueline Nicole Richards

In order to exchange information and resources with one another, plant cells use intercellular trafficking via pores known as plasmodesmata. A recent reverse genetic screen in our lab has identified several proteins potentially critical to plasmodesmata trafficking. One such candidate is TRANSITIONALLY CONTROLLED TUMOR PROTEIN (TCTP) 1, a highly conserved protein found in many eukaryotic organisms. Previous research has indicated that TCTP functions as a growth regulator in plants and that it may be involved with selective intercellular transport of molecules. The goal of our research is to determine the role of TCTP in intercellular communication via plasmodesmata. We utilized virus-induced gene
silencing (VIGS) to knockdown TCTP 1 expression in the Solanaceous species Nicotiana benthamiana and Solanum lycopersicum (tomato). Intercellular trafficking in silenced plants was measured by monitored cell-to-cell spread of the green fluorescent protein (GFP), which moves by diffusion through plasmodesmata. The silenced plants were also inoculated with Tobacco mosaic virus (TMV) to determine the effects of TCTP 1-knockdown and altered the intercellular trafficking on pathogen susceptibility. We expect to see reduced systemic viral infection in TCTP 1-silenced N. benthamiana and S. lycopersicum plants. The findings of our research will advance our understanding of the essential process of plant intercellular communication, and identify a potential new target for engineering crops with more desirable traits like increase carbon partitioning to parts of plants consumed by humans.

Poster # 498

Environmental Tracers Leading to an Answer on Pollution in Second Creek

Savannah Leigh Bellione

Student’s Department: Geology and Environmental Stdy

Faculty Mentor: Szynkiewicz, Anna

Second Creek, located near the University of Tennessee in Knoxville, Tennessee alongside greenways, is an urban stream that has been issued total maximum daily load reports (TMDLs) by the Tennessee Department of Environment and Conservation (TDEC) because of bacteriological contamination. The bacterial contamination affects the public’s safety and recreational activities. The major goal of this research was to identify if the isotope composition of sulfate and its concentrations are good environmental tracers for studying nonpoint and point source pollutions occurring in the Second Creek. Plausible pollution sources are the leakage of storm water and sewage pipes. In December of 2017, eight stream water samples were collected during a one day long rain storm event for chemical and sulfur (S) isotope analyses of sulfate dissolved in water ($\delta^{34}S_{\text{SO}_4^{2-}}$). We found that there was only slight variation in sulfate ($\text{SO}_4^{2-}$) concentrations in eight stream samples collected between 8 am and 11 pm. The highest $\delta^{34}S$ was measured in the first sample at 10:30 am (5.9 ± 0.1‰). With increasing stream flow the $\delta^{34}S$ decreased to 4.4 ± 0.1‰. Because of the variation in the isotope results it suggests that there are potentially two sources. The higher sulfate concentration is most likely from a nonpoint source pollution from the natural erosion of the stream bed and the lower sulfate concentration, for the second source, could possibly be leaking pipes or wastewater. The isotope results suggest that urban water sources are being affected by both point and nonpoint solutions.

Poster # 499

Optimization of High-throughput PAM (Pulsed Amplitude Modulated) Fluorescence Analysis of Aquatic Cyanobacteria for Detection of Herbicides in the Environment

Kara Delbridge, Jonathan Tri Nguyen, Jyotirmoy Mondal

Students’ Department: Chemical Engineering

Faculty Mentor: Bruce, Barry D

Kara Delbridge1, Jon Nguyen2, Jyortimoy Mondal2, Barry D. Bruce1,2

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Many herbicides have their primary effect on the process of photosynthetic electron transport. This effect is often associated with an alteration of the chlorophyll fluorescence form PSII. This can be measured using pulsed fluorescent measurements providing rich data on the change in fluorescence and the effect on photosynthesis. We have begun using several different cyanobacteria to see how they respond to the common herbicide Diuron™ or DCMU ((3-(3,4-dichlorophenyl)-1,1-dimethylurea). Application of DCMU will be tested on three cyanobacteria, two thermophilic cyanobacteria Thermosynechococcus elongatus BP-1 and Chroococcidiopsis. TS-821, and the mesophilic cyanobacteria, Synechocystis PCC 6803. These cyanobacteria will also be stressed by heat, light, and reactive oxygen species (ROS). When introduced to these stresses, cyanobacteria may undergo energy-dissipation mechanisms, for example, as a form of photoprotection. Fluorescence data is captured using a FluorCam and AquaPen instrument, from a suspension of cyanobacteria in custom designed 96-well plates. The 96-well plates were created with 3D printing and machining of the polymer Polyoxymethylene (POM) to maximize the detection of the fluorescence signal. This improvement was done by decreasing the plate depth and minimizing fluorescence from the plate material and by optimizing the optical configuration of the LEDs and detectors. This led to comparison dilution tests between the FluorCam and AquaPen with Thermosynechococcus elongatus and the model green algae Chlamydomonas reinhardtii. In pursuit of quantifying the fluorescence data and measuring stress tolerance, a program was developed to rapidly calculate the parameters and standard deviation for F0, Ft, Fl, and Qy. The program executes its commands as a function of well plate location so that multiple variables can be tested at once. Supported by the NSF, the Institute for a Secure and Sustainable Environment (UTK), and the Gibson Family Foundation.

**Poster # 500**

**Modeling adsorption and diffusion of atomic oxygen on the Ag(111) surface using kinetic Monte Carlo**

*Seth S Street, Sara Beth Isbill*

Students' Department: Chemical Engineering  
Faculty Mentor: Roy, Sharani

Oxidized silver surfaces are widely used as industrial heterogeneous catalysts to oxidize small organic compounds, such as ethylene. While surface-adsorbed oxygen is known to participate in catalysis, it has been suggested that ‘subsurface’ oxygen adsorbed in the near-surface region of silver also plays important roles in surface reconstruction and reactivity. However, the formation, motion, and chemical behavior of subsurface oxygen in silver are not well understood. In the present work, a kinetic Monte Carlo (KMC) simulation has been developed using the Python programming language to computationally model the diffusion kinetics of atomic oxygen (AO) at the Ag(111) surface. This simulation allows AO to move between various high-symmetry sites on the surface and in the subsurface of Ag(111). The diffusion rates required for the simulation have been calculated using density functional theory (DFT). The DFT-KMC simulation determines the relative populations of surface oxygen versus subsurface oxygen at various surface temperatures and oxygen coverages, promoting better understanding of the catalyst structure under different reaction conditions. Overall, our kinetic model describes the adsorption and diffusion of oxygen at both the surface and subsurface and helps to elucidate the role of subsurface oxygen in the structural and catalytic properties of silver.

**Poster # 501**

**Discovery of competitive and allosteric inhibitors for KRAS using high-throughput virtual screening strategies.**

*Wade Lowell Seifert*

Student’s Department: College Scholars Program  
Faculty Mentor: Smith, Nicholas
KRAS is a proto-oncogene which corresponds to the oncogene that is commonly associated with numerous types of cancers. This protein is part of the GTP phosphorylation cascade which when a mutation occurs in the KRAS proto-oncogene causes the cascade to be permanently stuck in the “on” position, causing uncontrollable cell growth leading to cancer. This sort of mutation can be thought of along the lines of competitive and allosteric inhibitors in trying to treat it. We perform high throughput in-silico screening using VinaMPI of ZINC database (~16 million compounds) to an ensemble of KRAS structures. The ensemble was constructed from molecular dynamics (MD) simulations. The compound was ranked based on the binding affinity calculated using the Autodock Vina scoring function. These receptors and ligands were run together to see the different binding affinities associated with each interaction, and the top hits from each subset of the ZINC directory were further explored to see the possibility of this specific compound being one that would be able to compete on the KRAS oncogene for binding. To date, over 8 million of the compounds in the ZINC database have been successfully docked and checked against the KRAS molecule, and the work to see exactly what each conformation for all of the top hits looks like is underway.

**Poster # 502**

**The Development of a rapid and reagent-free autobioluminescent yeast assay for the detection of dioxin-like compounds**

Anna Lois Young

Student’s Department: Biomedical Engineering

Faculty Mentor: Ripp, Steven

Dioxin-like compounds (DLCs) are a group of structurally related halogenated aromatic hydrocarbons including polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), and some polychlorinated biphenyls (PCBs). DLCs are extremely resistant to environmental degradation and metabolism, and because of their lipophilic nature are prone to accumulate in fatty tissues of animals and biomagnify along the food chain towards human consumption. Exposure to DLCs has been linked to numerous diseases and adverse health effects, such as disruption of the endocrine system, reproductive and developmental deficiencies, neurotoxicity, toxicity to the immune system, and metabolic diseases such as obesity and type II diabetes. An autonomously bioluminescent Saccharomyces cerevisiae BLYAhS bioreporter was developed in this study for the simple and rapid detection of DLCs and other aryl hydrocarbon receptor (AhR) agonists. This recombinant yeast reporter was based on a synthetic bacterial luciferase reporter gene cassette (lux) that can produce the luciferase as well as the enzymes capable of self-synthesizing the requisite substrates for bioluminescent production from endogenous cellular metabolites. As a result, bioluminescent signal production is generated continuously and autonomously without cell lysis or exogenous reagent addition. By linking the expression of the autobioluminescent lux reporter cassette to AhR activation via the use of a dioxin-responsive promoter, the S. cerevisiae BLYAhS bioreporter emitted bioluminescent signal in response to DLC exposure in a dose-responsive manner. The model dioxin, 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), could be detected within 4 hours with a half maximal effective concentration (EC50) of ~ 8.1 nM and lower detection limit of 500 pM using a 96-well plate high-throughput screening assay format. The autobioluminescent response of BLYAhS to other AhR agonists, including PCB-126 and PCB-169, 1,2,3,6,7,8-HxCDD, TCDF, benzo[a]pyrene, and β-naphthoflavone (bNF) were also characterized in this study. The bioassay was also able to detect the presence of TCDD directly from vegetable oil. The non-destructive and reagent-free nature of the BLYAhS reporter assay facilitated near-continuous, automated signal acquisition without additional hands-on effort and cost, providing a simple and cost-effective method for rapid DLC detection.
Poster # 503
Prospects for High Energy Followup Studies of Gravitational Wave Transients
Brandon Lynn Barker
Student’s Department: Physics
Faculty Mentor: Endeve, Eirik
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September 19, 2017
Abstract
As second-generation gravitational wave interferometers, such as Advanced Virgo and Advanced LIGO, reach their design sensitivities, a new lens into our universe will become available. Many of the most violent and energetic events in the cosmos, in particular the merger of compact objects and core collapse supernovae, are sources of gravitational waves and are also believed to be connected with Gamma Ray Bursts. Joint observations of electromagnetic and gravitational wave signals will provide an ideal opportunity to study the physics of these transient events and their progenitors. In particular, gamma ray observatories such as Fermi, coupled with precise sky localization, will be crucial to observe the high energy electromagnetic counterparts to gravitational wave signals. We constructed joint binary neutron star and gamma ray burst detection rate estimates using an analysis pipeline and report on the results of this analysis.

Poster # 504
Analyzing the Efficiency of a Metropolis Monte Carlo Simulation for a 2D Ising Spin Lattice
Kevin Gordon Kleiner
Student’s Department: Physics
Faculty Mentor: Johnston, Steve
Monte Carlo programs can simulate the probability-based behavior of systems of interacting atoms over time and reproduce the system’s electrical and magnetic properties. This was implemented for a square Ising lattice of interacting atomic spins to collect independent measurements of the crystal’s magnetization at varying times. Due to the updating algorithm for the spin sites, one system state was strongly correlated with the next state. To retain the validity of the magnetization average and variance calculations and minimize their bias, the simulation needed to only collect data when the states were nearly uncorrelated. Evidently, the time steps required for the 30x30 (dimensions in site numbers) lattice’s spin autocorrelation to drop below 10% ranged from ~20 steps when far from the critical temperature (ferromagnetic to paramagnetic phase change) to ~200 steps when very close to the critical temperature. This meant the lattice simulation needed to slow down considerably, and this issue was compounded with larger lattice sizes. The next step to improve the Monte Carlo simulation efficiency is to train a neural network to more quickly calculate the probabilities of flipping spins on the lattice.
Poster # 505

Synthesis of Ruddlesden-Popper Strontium Iridate Epitaxial Thin Films

Peyton Robert Nanney

Student’s Department: Physics
Faculty Mentor: Liu, Jian

We investigated the growth conditions conducive to synthesize Ruddlesden-Popper type SrIrO₃, Sr₂IrO₄, and Sr₃Ir₂O₇ epitaxial thin films via pulsed laser deposition (PLD). Many factors influence the thermodynamic interactions of the deposition and therefore, determines the material phase that is created. Through a systematic review of these growth conditions, we constructed a growth phase diagram that maps out conditions that enable stable formation of strontium iridate phases. We synthesized these phases with a single Sr₂IrO₄ target with varying the O₂ chamber pressure and the substrate temperature. These films allow for the analysis of magnetic properties of the material through vibrating sample magnetometry and other methods. Our findings demonstrate the control of the thermodynamic stability of different epitaxial layered structure of the complex Ruddlesden-Popper family.

Poster # 506

Growth and Observation of Magnetic Properties of Pyrochlore Titanites

Kyle Robert Noordhoek

Student’s Department: Physics
Faculty Mentor: Liu, Jian

Pyrochlore titanites exhibit multiple magnetic phenomena that challenge the fundamental theory of how spins should behave in a crystal lattice structure. To study these phenomena further, our group plans to synthesize a range of compounds that are within this pyrochlore titanite family, including those of YTO and DTO. While interesting magnetic properties are seen in polycrystalline samples, a single crystalline sample is necessary for fully exploiting and further study of the magnetic interactions. Thus, we explore the possibility of growing epitaxial thin films and heterostructures by Pulsed Laser Deposition (PLD). To begin, we will first be growing a layer of (YTO) onto a Yttria-Stabilized Zirconia (YSZ) substrate and afterwards attempting the same growth with a layer of (DTO). We have experimented with the growth of YTO already, using a range of temperatures at and above 700°C and pressures at and below 0.133 mbar, only after having treated the YSZ substrates. Lastly, we have been able to calculate the lattice parameter of the corresponding YTO crystal and monitor the topography of the samples using the Atomic Force Microscope (AFM). The phase and composition of the samples have been monitored using X-ray Powder Diffraction (XRD) and Energy Dispersive X-ray Spectroscopy (EDX).

Poster # 507

Nucleosynthesis in Core-Collapse Supernovae

Taylor Stevenson

Student’s Department: Physics
Faculty Mentor: Hix, William Raphael

The nucleosynthesis which occurs in core-collapse supernovae (CCSN) is one of the most important sources of elements in the universe. Elements from Oxygen through Iron come predominantly from supernovae, and contributions of heavier elements are also possible through the r-process, the gamma process, and the light element primary process. The ejecta composition depends on the mechanism of the explosion, thus simulations of high physical fidelity are needed to explore which elements and isotopes CCSN can contribute to GCE. We will analyze the nucleosynthesis results from self-consistent
CCSN simulations performed with CHIMERA, a multi-dimensional neutrino radiation-hydrodynamics code. We will present nucleosynthesis predictions for the explosion of a 9.6 solar-mass first-generation star, relying both on results of the 160 species nuclear reaction network used in CHIMERA and on post-processing with a more extensive network. The lowest mass iron core-collapse supernovae, like this 9.6 solar mass model, are distinct from their more massive brethren, with their explosion mechanism and nucleosynthesis resembling electron-capture supernovae resulting from Oxygen-Neon white dwarves. We highlight the differences between the nucleosynthesis of these models, discuss the need and mechanism to extrapolate the post-processing to times after the end of the simulation, and analyze the uncertainties this introduces.

**Poster # 508**

**Improving the Analysis of T Cell Movement**

*Viktor Samuel Zenkov*

Student’s Department: Computer Science  
Faculty Mentor: Ganusov, Vitaly

Vaccine-induced T cells play an important role in combating malaria by eliminating infection in the liver stage. However, as millions of hepatocytes inhabit a mouse liver and only some are infected, how T cells locate the infection site and eliminate infection remains poorly understood. Are T cells moving intentionally toward parasites, or randomly successful? To answer this, I used timed position data of malaria-specific T cells, non-specific control T cells, and a parasite, obtained from experiments in a mouse liver; I performed analyses with the null hypothesis that T cells move randomly. I used two metrics, based on distances from the parasite and turning angles. The tests performed with these metrics did not suggest the same conclusions. Investigating this inconsistency, I calculated the probability of a cell getting closer to the parasite as viewed from the distance metric, which turned out less than the assumed 50 percent. With this discovery, I improved the null hypothesis’ distribution. Applying this improvement to the original tests, the distance metric’s test results more resembled the angle metric’s. This development regarding the definition of random movement gets us one step closer to accurately analyzing cell position data and understanding T cell movement.

**Poster # 509**

**A GIS Approach to Water Quality Monitoring in Knox County, TN**

*Mason Cole Meyers, Thomas D Geissberger*

Student’s Department: Geology and Environmental Stdy  
Faculty Mentor: McKay, Larry D

This work describes preliminary development of a framework for student-led data collection and assessment of water quality in Knox County, Tennessee. Overall goals of the project are to help students develop research skills, while advancing understanding of geologic and anthropogenic factors influencing water quality in areas of diverse land use (e.g., urban, suburban, industrial, agricultural). The first step is the creation and field-testing of GIS-based methodology for collecting, presenting and sharing of field, laboratory and archival data on hydrology, geology, water quality and land use in a user-friendly manner. This involves application of ArcGIS Online and ArcMap for display and data management through multiple devices, with/without internet connection, in field and non-field settings. Field data collection and digitization uses the ESRI Collector application. The end-result is the construction of a database accessible through computers, tablets and/or smart phones to archive and quickly share data with other research team members. Initial steps include creating layers of topographic data, satellite imagery, political boundaries, and street/geologic maps along with spring locations from previously published government reports. Field-testing involves searching for springs and updating their locations using GPS coordinates derived from smart phones.
**Poster # 510**

**Mineralized fractures in the Siccar Point group, Gale Crater, Mars**

*Noah B Miklusicak*

Student’s Department: Geology and Environmental Stdy  
Faculty Mentor: Kah, Linda C

Understanding development of mineralized fracture fills is critical to deciphering the persistence of subsurface fluid flow on Mars. Within Gale crater, the Curiosity rover has documented evidence of and subsurface fluids in the form of complex mineralized vein systems. Here we use HiRISE images to map mineralized fractures within the Siccar Point group of Gale crater to explore the broader evidence for subsurface fluid flow.

The Siccar Point group (SPg) represents erosionally resistant, geologic materials that unconformably overlie previously eroded strata of the Murray formation. Further examination allows for division of the SPg into three distinct stratigraphic intervals: a lower, fractured unit; a middle, ridged unit; and an upper, cratered unit. Potential mineralized fractures occur as linear, positive relief features, forming polygonal networks that average ~7 meters in diameter and rarely penetrate beyond the lowermost strata of the SPg. Although the shape of individual polygons varies, the fracture networks possess surprisingly uniform size and density. Together, these observations suggest that (1) subsurface fluids were widespread in Gale crater after deposition and erosion of Mount Sharp; (2) the SPg was sufficiently lithified to inhibit migration of subsurface fluids; and (3) the SPg was regionally homogeneous, resulting in a uniform fracturing pattern.

**Poster # 511**

**Fun with Foraminifera in the K-12 Classroom**

*Audrey Noelle Parker, Jennifer Elizabeth Bauer, Maggie Ryan Limbeck*

Students’ Department: Geology and Environmental Stdy  
Faculty Mentor: Sumrall, Colin D

Virtual paleontology is critical to advancing paleontology education not only in college classrooms but in K-12 education. Virtual fossils provide easy accessibility to specimens in the form of object files that can either be used digitally or 3D printed. Foraminifera have many applications in the geosciences ranging from establishing paleoclimate to temporal patterns in deep sea sediments, but their small size (generally sub millimeter) restricts their use to classrooms that possess the equipment necessary to examine them. Enlarged models of foraminifera allow for easy exploration of the morphologies and applications of foraminifera. Digital fossils and potential 3D printed models of these specimens will allow teachers and students to better visualize these microscopic organisms and practice using fossil data to make observations and inferences.

Lesson plans developed to incorporate these scans explore shape, ornamentation, geologic time, the concept of index fossils, and other relevant science topics. In addition, all scans and lesson plans will be freely available for download through the myFOSSIL community. By providing STEM educators with the resources to include digital fossils in their classrooms, the next generation of students will be exposed to a greater diversity of scientific data.

**Poster # 512**

**Growth of Pentremites and implications for blastoid ontogeny**

*Christopher Edward Smith*

Student’s Department: Geology  
Faculty Mentor: Sumrall, Colin D
Ontogeny and phylogeny have been widely discussed over the past century in understanding the evolution of fossil forms. Evolutionary changes in ontogeny defined forms of heterochrony. Consequently, studying the ontogeny of species provides an opportunity to understand changes in morphology through changes in growth patterns. Heterochrony has been well documented in echinoderms, including blastoids, which are widely used as model organisms on which to assess morphological changes. They have a set number of plates that can be easily identified on each specimen facilitating the measurement of changes in morphology. Herein we examine one of the most successful and Mississippian blastoids, Pentremites. A common barrier to such a study is the low abundance of target specimens. However, the Upper Mississippian (Chesterian) Glen Dean Formation in Hopkinsville, Kentucky offers ample specimens. Ontogenetic studies often exclude specimens less than 5 mm in height, but here we include a full range of smaller specimens to provide a more complete ontogenetic sequence. Shale was sieved and picked for specimens and standard morphological measurements were made of each to fully capture ontogenetic changes. These data were compared using bivariate plots and reveal that the two common species were morphologically distinct early in ontogeny.

Poster # 513

Reconstructing pressure and temperature conditions: Thermobarometry and pseudosection modeling for the Cordillera Blanca batholith, Peru

Hannah Marie Teffeteller

Student’s Department: Geology Faculty Mentor: Jessup, Micah John

The Cordillera Blanca batholith is a young (8.2 Ma) granodiorite that forms the core of the ~200 km long Cordillera Blanca mountain range in the high Andes of Peru. Reconstructing the past temperature and pressure conditions for the Cordillera Blanca batholith is key to understanding its formation history. Amphibole thermobarometry has been established to determine emplacement conditions for use in calc-alkaline and alkaline igneous rocks, such as our sample from the Cordillera Blanca batholith. One previous group, Margirier et al. (2016), has used this technique on samples from the Cordillera Blanca batholith to determine a range of emplacement pressure (0.9±0.1 to 2.6±0.3kbar) and temperature (720–800°C) that can be made more robust through the addition of our samples containing the amphibole hornblende. This project also examines the applicability of pseudosection modeling, or forward modeling, to determine the pressure-temperature history of granitic rocks. Amphibole thermobarometry may provide a range of temperatures and pressures that speak to the formation history. However, it can neither speak to the extent of the stability field for amphibole and other minerals present, nor to the evolution of phase relations for a rock sample. Construction of a pseudosection will help elucidate these issues.

Poster # 514

Fundamental Research on Vaterite, A Calcium Carbonate Polymorph

Robert Seth Wood

Student’s Department: Geology Faculty Mentor: Kah, Linda C

R. Seth Wood1,3; Linda C. Kah1; Bryan C. Chakoumakos2; Brenda M. Pracheil3.

1. Earth and Planetary Sciences, University of Tennessee, Knoxville; 2Quantum Condensed Matter Division, Oak Ridge National Laboratory; 3Environmental Sciences Division, Oak Ridge National Laboratory
Vaterite is a metastable calcium carbonate phase that occurs in biogenic structures and, more rarely, in cold, alkaline environments. In fact, vaterite may be a necessary, transient phase between amorphous calcium carbonate (ACC) and calcite in both hyper-saturated aqueous environments and in the biomineralization of skeletal elements (e.g., in fish, gastropods, sea squirts, and foraminifera). Despite a growing body of research, the material properties of vaterite remain elusive because of vaterite’s metastable nature and its propensity to form microcrystalline precipitates. To better understand both the material properties and crystal structure of vaterite, two distinct, yet complementary, research projects are being pursued with colleagues at the University of Tennessee, Oak Ridge National Laboratory, and Washington University. By combining neutron diffraction, X-ray diffraction (XRD), and ICP-MS data collected on otolith pairs (fish ear bones) that contain varying ratios of vaterite, aragonite, and calcite, the distribution coefficients for Sr, Mg, Fe, Zn, and Ca incorporation into the vaterite crystal lattice can be calculated for this biogenically-derived vaterite. Additionally, through controlled crystallization experiments using CaCl2, NaHCO3, and organic macromolecules associated with biomineralization, we hope to better define conditions of formation and stabilization of biogenic vaterite and empirically determine its crystal structure using single-crystal XRD.

**Poster # 515**

**Experiments with Magnetic Susceptibility of Lake Sediments**

*Luke R Blentlinger*

Student’s Department: Geography  
Faculty Mentor: Horn, Sally P

In paleoenvironmental reconstructions, multi-proxy analyses of sediment profiles recovered from lakes and other inland water bodies can result in a more detailed characterization of past conditions in and surrounding the water body compared to a single-proxy approach. Paleolimnological researchers are often faced with the obstacle of obtaining the maximum amount of information from a limited amount of irreplaceable sediment. One method to maximize data is to use the same sediment sample for multiple analyses when their pretreatment protocols are the same or similar. This study assesses the viability of using the same material for magnetic susceptibility (MS) and X-ray fluorescence (XRF) analyses without contaminating data. Specifically, we tested how varying temperatures and the exposure to metal utensils in sampling and pretreatment can affect MS readings and whether XRF cells for an Olympus BTX profiler can serve as a suitable vessel for MS analysis in a BartingtonMS2B sensor.

**Poster # 516**

**Using LiDAR to Survey Vegetative Areas in Knox County**

*Tyler Clark Bock*

Student’s Department: Geography  
Faculty Mentor: Li, Yingkui

This project uses Geographic Information Systems and aerial LiDAR data publicly available from the USGS 3D Elevation Program to classify vegetation characteristics in the selected Baker Creek area of Knox County. Using ArcGIS and other GIS based tools, I will create various surface models from the LiDAR data including Digital Terrain Models and Digital Surface Models. These models will allow me to derive vegetation from surrounding areas of bare earth, water and urban development, as well as create a canopy height model and determine canopy density. The resulting products are the beginning stages of further studies of local environmental issues using LiDAR by the UTK Geography department.
Global Spatial Gridding Software for Analysis and Exploration of World Spatial Patterns

Randall Jordan Brown

Student’s Department: Mathematics
Faculty Mentor: Raposo, Paulo

The Open Geospatial Consortium (OGC) has adopted Discrete Global Grid Systems (DGGS) as a standard geospatial data format because of their abilities to index and summarize world-wide data. This project built a piece of desktop software that models the globe using NASA WorldWind and world-wide spatial grids defined by original code. The app accepts any set of geographic data points as a CSV file and grids them at multiple resolutions to render multiple interactive maps. The app will be used to map and explore spatial statistics and distributions in both analysis and teaching settings. My role in the project involved writing and editing python scripts that grid multiple data points into cells defined along the earth’s surface.

Assessing Old and New Data to Digitally Reconstruct Morphology

Michelle Logan Qualls, Jennifer Elizabeth Bauer

Student’s Department: Geology
Faculty Mentor: Sumrall, Colin D

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Traditionally, in order to assess the internal anatomy of Paleozoic invertebrates, serial sections were made. Production of these sections renders destruction of the specimen unavoidable. New imaging techniques, including X-ray imaging via synchrotron or micro-CT, provide a nondestructive approach for internal morphological assessment. These techniques, however, cannot always differentiate the fine density variations between skeletal material and sediment infill that are present in many invertebrate fossils. Here, we compare the traditional serial sections and new imaging techniques via digital reconstruction of the internal respiratory structures of extinct echinoderms.

Here, the same species is reconstructed via both methods to reveal the major similarities and differences between the techniques. The traditional reconstruction methodology was developed by collaborators at Appalachian State University and requires a program to render vectors into 3-D; in this study, we use Rhinoceros. For synchrotron data, the internal anatomy was reconstructed using SPIERS. Both methods provided similar anatomical models, however, reconstruction via SPIERS proved to be more useful as you can easily examine the exterior of the specimen alongside the internal morphology whereas reconstruction via Rhinoceros was more precise as the internal anatomy was more easily distinguished from the surrounding sediment infill.

Archaeometric Approaches to the Roman Near East

Gayatri Nandwani
Student’s Department: Classics  
Faculty Mentor: Darby, Erin Danielle

The purpose of my research this summer has been to participate in a full suite of archaeometric and geoarchaeological analyses, particularly as they are applied to sedimentology. The first section of my research has focused on an introduction to these procedures at ARL including laboratory safety procedures, proper sample collection and processing methods, and introduction to methods and purposes for a variety of laboratory analyses including grain size distribution analysis using a state of the art Malvern Mastersizer 3000 laser diffraction particle size analyzer, organic matter and inorganic carbon analysis, and microartifact analysis. During the field collection phase I worked directly with Dr. Erin Darby and Howard Cyr (UT ARL) recording and analyzing soil stratigraphy and taking soil samples for post-season analysis. Upon their return from the field, I worked with ARL to analyze the curated sediment samples during the 2017 field season.

Poster # 520

Potential Contamination Risk in Tennessee Aquifers from Oil and Gas Drilling

Emma E Reed

Student’s Department: Geography  
Faculty Mentor: Tran, Liem

The practice of drilling for oil and gas raises environmental concerns for potable drinking sources such as underground aquifers since contamination is an associated risk. About 16,000 oil and/or gas well permits are in existence in the state of Tennessee, according to public record. A large portion of the permits date back to as early as the 1960’s while others pre-date state regulations requiring permits. The question of whether older wells introduce a greater risk of contamination is up to debate. Therefore, the objective of this research is to qualitatively assess the potential risk of contamination in Tennessee aquifers due to oil and natural gas drilling using temporal and spatial characteristics. This study uses public records that provide information on the wells’ location, purpose, and depth. The dates and statuses of the well permits are taken in account to determine which aquifers are at risk for contamination due to dated equipment, improper or defective sealing, poor management, etc. Using Esri’s ArcMap software, the study analyzes the density of in-operation, pre-permit, plugged, and abandoned wells within each county to determine the relative risk of contamination. This information may help manage and regulate old or abandoned wells by prioritizing those that pose a greater risk to groundwater supplies. Also, this information may be presented to governmental agencies to address the issue of missing data, and provide them with valuable insight into the practice of oil and gas drilling.

Poster # 521

Etheostoma Duryi

Hannah Marie Alloway

Student’s Department: Ecology/Evolutionary Biology  
Faculty Mentor: Keck, Ben

Although we do know much about the biodiversity in the Tennessee River and its tributaries, much of the diversity may be unrecognized. In order to fully understand biodiversity, we much gain a greater knowledge of the species present in this system. In the past, fully representing the biodiversity in this system has been difficult due to the lack of technology and the lack of manpower. However, recent phylogenies of darters (Percidae: Etheostomatinae) have identified possible unrecognized diversity in Etheostoma duryi. Etheostoma duryi is found throughout the Tennessee River and its tributaries. It mainly inhabits riffles and the rocky pools. We are evaluating morphological traits, like fin ray and scale counts, of specimens collected in the past. So far, we have found variation among three different regions of the Tennessee River.
We are currently working to increase the sample size, analyze our findings in more restricted areas of the system, and build a new genetic dataset.

**Poster # 522**

**Frequency of Hemlock Woolly Adelgid Information provided in the Media: Impacts, Ecology, and Citizen Outreach**

*Anna Kileen Cameron, Casey Jackson Fellhoelter, Lucas Jeffrey Smith, Bevin Alexandra Hardy*

Students’ Department: Biology

Faculty Mentor: Leppanen, Christy

An analysis of 165 media articles about the hemlock woolly adelgid (HWA), an invasive insect killing native hemlocks in eastern North America, was undertaken to determine possible influences to the public’s desire and ability to help with invasive species prevention and control. All of the articles mention at least one of the following: HWA impacts to ecosystems (55.2%), hemlock characteristics (47%), and the value of hemlocks (38.8%). Articles that mention HWA impacts and hemlock value also mention associated topics such as subsequent impacts from hemlock loss to shade and temperature control of forests and streams, trout and recreational fishing, and the importance of hemlocks as a keystone species. 22.4% of articles provide advice or contact information for citizens to report HWA infestations or get involved in outreach programs, or to help educate readers about how to prevent further HWA spread and introductions. Informing citizens about HWA invasions can be useful to detect early infestations, range, and spread, and to coordinate control. This allows transparency as well as education and community participation in management, reducing negative impacts.

**Poster # 523**

**Interactions and growth dynamics of Prochlorococcus, Rhodospirilaceae, and Alteromonas in a co-culture environment**

*Vasily Giovanni Carniello*

Student’s Department: Microbiology

Faculty Mentor: Zinser, Erik

Interactions between different species of microorganisms have a significant role in the growth dynamics within the environment. The specifics mechanisms of these interactions, however, are overall poorly understood. The purpose of this study is to study the interactions between Prochlorococcus (Vol1), Rhodospirilaceae (EZ54), and Alteromonas (EZ55) and establish what effects they will have on one another in co-culture. This study attempted to establish the exact method by which the interaction occurs. The EZ55 and EZ54 strains used in this experiment were marked with an antibiotic resistance mutation. The EZ55 strain was marked with kanamycin resistance, while EZ54 was marked with spectinomycin resistance. The mutations were otherwise fitness neutral.

Vol1 cells were grown up in nine tubes. Three of those tubes were left with Vol1 alone, as a negative control, three tubes were inoculated with EZ55, and the last three were inoculated with EZ54. Three tubes were inoculated with EZ55 alone and another three inoculated with EZ54 alone. Three tubes were also inoculated with EZ55 and EZ54. All tubes were incubated at 24°C in a rotating drum and viable cell counts were preformed every hour. Agar plates supplemented with kanamycin and spectinomycin were used to select for only EZ54 or only EZ55 colonies during the counting. The data for this experiment will be presented with the poster.
Synechococcus as an HOOH-Consuming Helper for Prochlorococcus

Abigail Mcgettigan Jarratt

The marine cyanobacterium Prochlorococcus is an abundant and globally important microbe that contributes an estimated 40% of bacterial production in the oligotrophic ocean. The success of this photosynthetic bacterium is largely a consequence of its small cell size and streamlined genome, which are advantageous in nutrient-limited environments. However, this genomic streamlining has also led to the loss of the gene (katG) encoding catalase, an enzyme that is essential for the degradation and detoxification of the reactive oxygen species hydrogen peroxide (HOOH). HOOH is naturally present in the illuminated waters of the ocean, and in the absence of catalase, Prochlorococcus is vulnerable to the cell-damaging and potentially lethal effects of HOOH-related oxidative stress.

Previous work has demonstrated that catalase-positive heterotrophic members of the marine microbial community—termed “helpers”—can facilitate the growth of Prochlorococcus by removing HOOH from their shared environment. The present study investigates whether Synechococcus, a catalase-positive cyanobacterium closely related to and often found alongside Prochlorococcus, is also able to serve as a helper to Prochlorococcus by consuming HOOH that is present in shared culture medium. The characterization of this interaction provides insight into the ecological relationship between these two numerically dominant cyanobacteria.

Breeding Behavior of the Gray-breasted Flycatcher (Lathrotriccus Griseipectus) in Southwestern Ecuador

William Harris Kirkpatrick

The Tumbesian region of southwestern Ecuador and northwestern Peru is home to a large number of endemic bird species. Many of these species are threatened with extinction, and little is known about their basic biology. Thus, information regarding natural history of species in the region is needed to guide conservation management. We studied the reproductive biology of the Gray-breasted Flycatcher, Lathrotriccus griseipectus, a small Tyrannid that lives in the Tumbesian region. Due to habitat destruction, the range size of L. griseipectus has dwindled and the species is now listed as Vulnerable on the IUCN Red List. We used a mounted camera to record for the first time the breeding behaviors of adults at the nest. We recorded 80 hours of activity across 7 days. We analyzed video footage for the amount of time adults cared for young and recorded fledging of the nestlings. We then compared these data to a species in the same genus, L. euleri, that is common and has a large range size to better understand difference between the two. By examining the breeding behavior of L. griseipectus, our work sheds light on reproduction of a rare, endemic species and provides critical information for conservation management plans.

"The disclosure of hemlock wooly adelgid management and control through media representation"

John Jacob Lockyer, Macey Renea Clevenger

"The disclosure of hemlock wooly adelgid management and control through media representation"
A systematic review of 165 media articles regarding the hemlock woolly adelgid (HWA), an invasive insect devastating native hemlocks in Eastern North America, was conducted to understand media portrayal of risk associated with invasive species management. The majority of articles discussing control report that managers supported the release of biological control agents and chemical use, the former a method with inherent uncertainty in risk estimates and the latter a broad-spectrum, non-specific control method. Only seven articles mention non-target effects of biocontrol on native species or the surrounding ecosystem, characterizing risk as unlikely in five articles and possible in two articles. Only seven articles mention some non-target effect of chemical control on native species (e.g., pollinators and birds), water quality, or the surrounding environment (e.g., soils). Only one native biocontrol agent is mentioned, a fungus, Leccanicillium muscarium, and there is no mention of other native species, notably about hybridization between an introduced biocontrol agent and the native beetle, Laricobius rubidus. Disclosing such information is necessary to accurately and ethically inform the public about invasive species management.

Poster # 527

**Post-fire ectomycorrhizal associations with Pinus sp. in the Great Smoky Mountains National Park: Year one**

*Alexis Victoria Case*

Student’s Department: Ecology/Evolutionary Biology \hspace{1in} Faculty Mentor: Hughes, Karen W

Table Mountain Pine (Pinus pungens), an Appalachian endemic, demonstrates serotiny in that the cones open and disperse seeds after a fire. In late-2016, three populations of Table Mountain Pine in the Great Smoky Mountains National Park were subject to high-severity fires. While the fires destroyed both trees and the organic soil layer, open cones on standing dead trees still dispersed seeds. As a result, germinating pine seedlings were observed in the spring following the fire. Pine seedlings require the development of symbioses with ectomycorrhizal fungi, which are crucial for their growth and establishment but can be sensitive to environmental disturbances such as soil heating from fire. This can affect availability of ectomycorrhizal fungi to form associations with the roots of young pine seedlings, and therefore have consequences for host survival and success following fires. This study investigates ectomycorrhizal recolonization of growing Pinus host seedlings by examining temporal and site-specific shifts in dominant ectomycorrhizal species after the 2016 fire. We hypothesize that: 1) there will be site-specific differences in early mycorrhizal colonization, and 2) there will be succession of ectomycorrhizal fungi as more efficient mycorrhiza recolonize the soil.

Poster # 528

**Using system dynamics to explore impact of draught on Tennessee agricultural practices**

*Cody Hudson*

Student’s Department: Geology and Environmental Stdy \hspace{1in} Faculty Mentor: Tran, Liem

Drought is a natural disaster that affects many citizens of Tennessee. Lack of rainfall reduces crop yields and, in turn, food availability and income. As droughts become more frequent and extreme, adaptation is a fundamental to drought is a concern for Tennessee. To support a development of drought adaptation policies, a system dynamics model was developed for Tennessee water resources. The model simulates the interdependencies between water availability, human population and agricultural production. This system is designed to explore the interactions between rainfall, water consumption and agriculture.
Poster # 529

Pollinator Exclusion Experiment as a Means of Testing the Strength of Phylogenetic Relationships in Solidago Species

Heiler Christian Meek

Student’s Department: Ecology/Evolutionary Biology  
Faculty Mentor: Schweitzer, Jennifer

Pollinators are important to the function and reproduction of angiosperm species and the ecosystems they contribute to. Pollinator species have been declining in recent years and have reached critical levels in some areas. As pollinator populations have begun to decrease at levels disproportionate to their recovery due to climate change, a future with dwindling pollinator populations seems all the more likely. Members of the genus Solidago are considered index species in many of the areas they inhabit. Because so much is known about them genetically and phenotypically, determining their responses to pollinator loss—through pollinator exclusion—can be applied to many other plant species to infer potential plant and plant community responses. A pollinator exclusion experiment was performed on replicates of thirteen different Solidago species native to North America, in a common garden setting. The goal of this study was to explore the possibility of a link between pollination and the growth output of these eighteen Solidago species by comparing growth traits of bagged flowering stems to unbagged flowering stems. It was found that plant height and internode diameter were somewhat correlated to pollinator exclusion. This was compared to a phylogeny for the tested Solidago species.

Poster # 530

Climate change would make trees from warm vs. cool populations more conservative of nutrients

Han Lee Noh

Student’s Department: Ecology/Evolutionary Biology  
Faculty Mentor: Schweitzer, Jennifer

The climate is changing. A recent report found that 2016 was the warmest average year on record in all of recorded human history on earth – this warming will have profound impacts on plants and their associated ecosystems.

Research conducted in the lab and field provides insightful information on how plants respond to warmer and colder conditions. Although studies have been conducted on how plants respond to climate change, we know very little about how climate change may influence nutrient conservation and translocation in plants. Riparian forests in the western U.S. are hotspots of biodiversity therefore any factor that influences plant growth and nutrient content will impact 100’s of other species.

Plant communities respond to temperature change but the direction and magnitude of climate change effects may vary among plant populations and communities (Harrison et al. 2010). Studies have shown that endemic plants have the ability to adapt to warmer and cooler environments (Harrison et al. 2009). Due to immobility of plants, some plants may adapt by conserving nutrients in the leaves and roots. So researching nutrients like Carbon and Nitrogen will help to predict how is growth rate of plants and crops reacts to the climate change. In addition different scales of elevation was used in research to see nutrients level will be differs.

Poster # 531

Molecular Barcoding of Eupatorieae of Tennessee

Magen Rae Poindexter

Student’s Department: Biological Sciences  
Faculty Mentor: Schilling, Edward
Molecular analysis has become a popular method used to characterize the complex biodiversity of our world. In this project, we have been able to add to the understanding of the native species of Tennessee by analyzing particular regions of DNA. We obtained DNA sequences for a standard barcode marker from each of about 30 species belonging to the Eupatorieae tribe found in the state. This process of molecular barcoding has produced a catalog of the state’s diversity of these plants. With this, we are better able to identify unknown samples and aid in the conservation of rare plants such as Eupatorium leucolepis. This plant, also known as justiceweed, is a flowering plant currently listed as endangered in the state of Tennessee. While commonly found in the coastal plain region, justiceweed is also native to one county in Tennessee. Isolated by hundreds of miles from any other of its species, the populations of this plant found in Tennessee have raised some questions. Is this truly the same plant that grows along the eastern coast of North America? If so how did it come to occupy this land locked state? So far, we have been unable to find a characteristic to distinguish Tennessee’s justiceweed from that of coastal plain populations. However, molecular data have determined that the plants in Tennessee previously identified as E. leucolepis differ significantly from those found in the coastal plain region, and instead are hybrids of E. leucolepis and E. semiserratum, a species more commonly found in Tennessee.

Poster # 532

Spatial Analysis of Mountaintop Mining’s Impact on Water Quality and Macroinvertebrates

Samantha M Cahill

Student’s Department: Chemical Engineering
Faculty Mentor: Giam, Xingli

Since the 1970s, mountaintop mining (MTM) has been an important driver of land use change in the Appalachian Mountains. In many studies, MTM has been shown to have negative effects on both biological communities and water quality downstream of mining. However, the impacts of MTM have not been extensively studied in Kentucky. Here, I aim to analyze the effects of MTM on both water quality and benthic macroinvertebrates in streams of the Southern Appalachian Mountains in Kentucky. I combined a remotely sensed mining landcover product with data on water quality parameters and stream macroinvertebrate communities from state and federal monitoring programs to examine how mining at different spatial scales impacts stream water quality and biotic communities. Using geospatial statistical analysis in ArcGIS and the R statistical environment, the percent of mining on both a catchment level and larger watershed level is calculated and used to examine the effects of MTM on the sample sites. The analysis is centered around the year 2015, providing relevant and up to date analysis with the current coal mining in Kentucky. Through this project, a better understanding of the accumulative and local effects of MTM on both water quality and the benthic macroinvertebrates of nearby streams can be obtained.

Poster # 533

Investigating tPA and ethanol in the mammalian circadian clock

Rachel Brandes

Student’s Department: Interdisciplinary Programs
Faculty Mentor: Prosser, Rebecca A

The suprachiasmatic nucleus (SCN) in the hypothalamus of the brain regulates the circadian clock, controlling daily rhythms in behavior and physiology. Research from the Prosser lab shows that ethanol and tPa influence the circadian clock: ethanol blocks the effects of glutamate-induced phase shifts and tPa allows glutamate-induced phase shifts. In other brain regions, tPa mediates ethanol-induced effects, including rewarding effects and withdrawal. Therefore, we are investigating whether tPa mediates ethanol’s effects in the SCN using western blotting and electrophysiological recordings.
of SCN slices. By using tPa knockout mice, we will determine whether ethanol still blocks these phase shifts when mice are treated with both ethanol and glutamate through electrophysiological recording. We are also using western blotting to determine the presence of tPa in ethanol and glutamate treatments based on acute, rapid, and chronic tolerance as a control for the tPa knockout group. However, we hypothesize that ethanol will not have an effect on glutamate-induced phase shifts in tPa knockout mice, meaning that it uses only tPa as a mechanism for this function. These findings will determine if tPa is necessary for ethanol’s blockage of glutamate-induced phase shifts in the SCN or if other mechanisms could be involved.

Poster # 534

Effects of Social Dominence on Defeat–Induced Neural Activity in A Ventral Hippocampus-to-Basolateral Amygdala Circuit

Kimberly Summer Bress

Student’s Department: College Scholars Program

Faculty Mentor: Cooper, Matthew A

Interactions between the ventral hippocampus (vHPC) and the basolateral amygdala (BLA) play a critical role in the processing of emotional memories. While these brain regions are implicated in the development of stress-related mental illness, the role of a vHPC-to-BLA neural circuit in susceptibility to the effects of stress is not well understood.

After exposure to acute social defeat stress, male Syrian hamsters exhibit a submissive behavioral response called conditioned defeat (CD). Importantly, hamsters with subordinate social status display an elevated CD response compared to dominants and controls.

In this study, adult male Syrian hamsters were paired in daily agonistic encounters for 14 days, during which they formed stable dominance relationships. On day 9, stereotaxic surgery was performed and cholera toxin B (CTB) was injected into the BLA. After a 48-hour recovery period, animals completed days 10-14 of their dominance interactions. 24 hours after the last dominance encounter, dominant, subordinate, and social status control animals were exposed to acute social defeat stress, consisting of three 5-min defeats at 5-min intervals. 60 minutes after the third defeat, hamsters were transcardially perfused and brains were collected for CTB and c-Fos immunohistochemistry.

We found that exposure to social defeat did not alter the number of c-Fos positive cells in the vHPC, and that there was no effect of dominance status. Additionally, exposure to social defeat did not affect the number of c-Fos/CTB double-labeled neurons in the vHPC. There were no status dependent differences in c-Fos/CTB double labeling. These results suggest that repeated aggressive encounters do not affect stress-induced c-Fos expression in the vHPC. Because exposure to social defeat stress did not significantly increase neural activity in vHPC neurons projecting to the BLA, a vHPC-to-BLA circuit may not play a key role in controlling status-dependent changes in CD vulnerability.

Poster # 535

Examining diurnal differences in the extracellular matrix components in mammalian circadian clock

Randy Carpenter

Student’s Department: Interdisciplinary Programs

Faculty Mentor: Prosser, Rebecca A

The suprachiasmatic nucleus (SCN) of the hypothalamus synchronizes the body’s 24-hour (or circadian) clock to the environment. Sustained circadian disruptions are linked to the development of metabolic disorder, certain cancers, and neurodegenerative disorders. Our laboratory aims to uncover a relatively unknown aspect of circadian rhythms: how
extracellular matrix (ECM) proteins regulate SCN circadian rhythms. Recently, we saw that inhibiting matrix metalloproteinase-9 (MMP-9) in the SCN causes time dependent phase shifts in circadian rhythms. MMP-9 is known to cleave cellular adhesion molecules (CAMs) that connect adjacent neurons and glia. What is not known, however, is which ECM proteins MMP-9 may cleave in the SCN and if this relationship regulates circadian rhythmicity. We hypothesize that day/night changes in MMP-9 activity lead to decreased CAM interaction between neurons, subsequently affecting daily oscillations in SCN neuronal activity rhythms. To investigate this relationship, we used immunohistochemistry paired with fluorescent microscopy to locate and quantify levels of MMP-9 and the CAM collagen-4a. Preliminary results suggest increased nighttime expression of both MMP-9 and collagen-4a. These data provide fundamental information for further understanding which ECM components regulate circadian rhythms and can lead to future studies that investigate ECM involvement in disease pathologies associated with circadian disruption.

**Poster # 536**

**Identification of brain regions involved in neuronal plasticity in a female mouse model of Rett Syndrome**

Delaney Fisher, Ronald Franz

Students’ Department: Chemical Engineering
Faculty Mentor: Krishnan, Keerthi

Rett Syndrome is diagnosed as a neurodevelopmental disorder that results in loss of motor skills and Rett Syndrome is an autism-associated spectrum disorder that effects 1 in 10,000 females worldwide. Rett Syndrome is cause by mutations in the MECP2 gene. This neurodevelopmental disorder is characterized by altered synapse connections early in life that produce debilitating phenotypes during early development that worsen throughout life. One such phenotype is deficits in social communication. How MECP2 mutations affect social communication is unknown. Recently, we used the pup retrieval behavior, a robust ethologically-relevant social communicative paradigm, and showed that heterozygous mutant Mecp2 female mice (Mecp2Het) fail to retrieve pups. This altered behavior in the Mecp2Het was linked to aberrant experience-dependent plasticity of the auditory cortical GABAergic network, through the increased formation of perineuronal nets (PNNs). This pup gathering behavior is a multifaceted behavior that involves somatosensation, motor coordination, auditory and olfactory information. Using whole brain immunostaining and imaging, we found that the somatosensory cortex of the Mecp2Het exhibits similar abnormal increase in PNN formation as the auditory network, suggesting altered plasticity in the region. Moreover, we have identified interesting hemisphere-specific changes in the motor cortex of the Mecp2WT female post-behavior. Our data thus far suggest that during pup retrieval behavior, MeCP2 regulates plasticity of the extracellular matrix molecules, in a region-specific, hemisphere-specific manner.

**Poster # 537**

**Investigating urokinase-type plasminogen activator receptor’s (uPAR) role in the mammalian circadian clock**

Robert Martin Frederick

Student’s Department: Neuroscience
Faculty Mentor: Prosser, Rebecca A

The suprachiasmatic nucleus (SCN) in the hypothalamus of the brain functions as an internal clock, establishing and maintaining 24 hour circadian rhythms in behavior and physiology. The SCN maintains synchrony with the environment by phase shifting, or resetting the circadian rhythm. Glutamate in the SCN triggers phase shifts in response to light. Previous research demonstrated that tissue-type plasminogen activator (tPA) gates glutamate-induced phase shifting via BDNF maturation. Surprisingly, phase shifting occurs in tPA knockout (tPA-/-) mice. Evidence suggests urokinase plasminogen activator (uPA) compensating for the lack of tPA, but through a mechanism without mBDNF. uPA interacts
with its receptor, urokinase-type plasminogen activator receptor (uPAR), in other biological systems, therefore we are investigating uPAR’s contribution to SCN phase shifts. We investigated uPAR expression in the SCN using western blotting. We find that uPAR is stably expressed in the SCN, and is not rhythmic. Current studies involve single cell electrophysiology recordings of neuronal activity in the SCN to assess if the uPA-uPAR interaction is necessary for glutamatergic phase shifting. To test this hypothesis, we used the uPAR antibody (R&P Systems uPAR Antibody (AF534)) to disrupt the uPA-uPAR interaction and analyzed the recordings to see if a phase shift was still present.

Poster # 538

Olfactory Perception Behavior in Drosophila melanogaster (Fruit Fly)

Richard Vuong, Rachel Shah

Students’ Department: Interdisciplinary Programs

Faculty Mentor: Park, Jae H

Having a stuffed nose is not the only thing that affects the sense of smell. Various genotypic factors have also been found to influence olfactory chemoreception. Genotypic factors have been seen to influence olfaction, such as Congenital Anosmia from Kallman syndrome, but the molecular pathways of olfactory perception remain largely unknown. To develop a stronger understanding of the molecular underpinnings, we conducted olfactory behavior tests through the use of Drosophila melanogaster (Fruit Fly). In this experiment, we tested and compared the behavior of fruit flies by utilizing the olfactory trap assay mechanism developed last year (Vuong & Park, 2017). Three genotypes Wild-type (Cs), Corazonin (CrZR01), and Clock (CLKJrk) were used in this project. On average, Cs flies had the highest attraction index followed by CrZR01 then CLKJrk with the lowest index. The genetic mutations of CrZR01 and CLKJrk are thus assumed to have some influence on the resultant olfactory behavior. However, a phenomenon we discovered was the high death rate of CLKJrk flies within the trap system. The high mortality rate of CLKJrk flies may explain the low attraction index (0-20% over 24 hours) and motivates discussion of the influence of this genotype on other physiological processes.

Poster # 539

The role of executive functions in depression and attention-deficit/hyperactivity disorder (ADHD) symptomatology.

Jessica Lynn Anderson

Student’s Department: Psychology

Faculty Mentor: Bolden, Jenn

Attention-Deficit/Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder that affects about 5% of children (APA 2013). ADHD is characterized by symptoms of inattention, impulsivity, and hyperactivity that interfere with functioning in multiple areas of life (APA 2013). Larson et al. (2007) found that while 14% of children with ADHD experience depression, only 1% of children without ADHD experience depression. Models of ADHD link ADHD symptoms to underlying deficits in executive functions (EFs; Barkley, 1997). EFs are viewed as control mechanisms that coordinate complex cognitive processes (Miyake et al., 2000). EFs include working memory, monitoring, and inhibition. EF impairments are also associated with depression severity (Dermott and Ebneier, 2009).

Parents of children aged 8-12 completed ratings of ADHD symptoms and children completed ratings of depression. We examined the relations among ADHD symptoms, depression symptoms, and EF deficits. We examine the relation between ADHD and depression symptoms, the relation between ADHD symptoms and EFs, and the relation between depression and EFs. Preliminary analyses document only positive relations between ADHD symptoms and EFs.
ADHD symptoms were unrelated to depression symptoms. Exploratory analyses will examine the extent to which executive functions are related to specific depressive subscales (i.e., self-esteem, ineffectiveness). Clinical/research implications will be discussed.

**Poster # 540**

**Acute social defeat stress induces microglial activation in key limbic regions**

*Thomas T Clarity*

Research suggests a causal relationship between neuroinflammation and stress-related psychopathologies. Exposure to moderate psychological stress in rodent models leads to elevated markers of immune activity in the brain, for example, microglia. Research has shown that tail shock stress can prime the subsequent, immune-challenged activation of microglia, which can lead to a degradative, proinflammatory response. Although social defeat is an ethologically relevant model of acute stress, there has been little research investigating the effects of acute social defeat stress on immune activity. Here, we used an acute social defeat paradigm in Syrian hamsters consisting of three, 5-minute aggressive encounters in the home cage of a three, novel resident aggressors. Then, 24-hours following social defeat, the effects of stress-induced priming of microglial activation was assessed by exposure to an endotoxin immune challenge via intraperitoneal injection of lipopolysaccharide (LPS). Four hours after injection, hamsters were euthanized and the activation of microglia was determined via immunolabeling of the ionized calcium-binding adaptor protein-1 (Iba-1), a marker that is expressed in activated microglia. Preliminary data suggest that LPS injection leads to increased Iba-1 immunoreactivity both in the presence and absence of social defeat stress in the ventral medial prefrontal cortex and dorsal raphe nucleus. Interestingly, acute social defeat also led to the activation of microglia in these regions in the absence of an LPS injection. Furthermore, it appears that all defeated animals,

**Poster # 541**

**Effects of Alcohol on Defeat-induced Social Avoidance in Mice**

*Emily Lynn Graham*

Studying the effects of alcohol consumption on stress resilience is an important step towards understanding the comorbidity of alcohol abuse and Post-Traumatic Stress Disorder. Based on former stress models in rodents, it is apparent that social defeat induces social avoidance in mice. The objective of this study was to investigate how alcohol consumption of mice affects social avoidance. There were four groups studied in this experiment. Two sets of mice were socially defeated and one cohort was provided ethanol while the other was given water. Two other sets of mice were not socially defeated and one subset was provided ethanol, while the other was given water. The mice were tested for two five minute back to back trials, once with an empty, plastic perforated box and then immediately after with a mouse in the plastic perforated box. The mice were tested once every seven days for three weeks. We determined that social defeat causes the mice to spend significantly less time exhibiting social behavior than the non socially defeated mice. The data provides that mice that were socially defeated and drank alcohol did not gain resilience to the social stress, while the socially defeated mice that drank water did gain resilience over the course of three weeks. We also found that there is a trend that alcohol decreases the amount of time that the mice actively avoid socializing at the extreme. These findings suggest that alcohol consumption does affect the social tendencies of the mice. This research also improves the current
understanding of alcohol on stress resilience in mice, which could in turn aid knowledge on stress-related psychopathologies.

Poster # 542

Sex differences in the effects of social status on defeat-induced social avoidance in Syrian hamsters

Annie Laurie Loewen

Student’s Department: Psychology

Faculty Mentor: Cooper, Matthew A

Understanding the neuroendocrine mechanisms that support stress resilience is an early step toward developing more effective treatment options for patients who suffer from stress-related psychopathologies. We have previously shown that male Syrian hamsters exhibit elevated social avoidance following acute social defeat stress. Male hamsters with dominant social status exhibit elevated plasma testosterone, increased androgen receptor expression in the medial amygdala (MeA) and ventral lateral septum (vLS), and less defeat-induced social avoidance compared to subordinates and controls. The objective of this study was to investigate whether dominant female hamsters show changes in testosterone concentration, androgen receptor expression, and defeat-induced social avoidance. Adult female hamsters were matched according to their estrous cycle. Both female and male hamsters were paired in 12 daily social encounters to establish dominance relationships. Blood was collected subjects prior to and 15 min following their first dominance encounter. Animals experienced acute social defeat stress and 24 hours later received a social interaction test with a same-sex, unfamiliar hamster. While acute social defeat stress produced social avoidance in both male and female hamsters, social status altered social avoidance and plasma testosterone in males but not females. These findings suggest the neuroendocrine mechanisms controlling the effects of social status on defeat-induced changes in behavior in male hamsters do not generalize to female hamsters. This line of research improves our understanding of the neuroendocrine mechanisms regulating sex differences in vulnerability to stress-related mental illness.

Poster # 543

The Effects of Relationships on ANS function and Wellness

Olivia M Maples

Student’s Department: Psychology

Faculty Mentor: Baldwin, Debora

The quality of relationships and social networks plays a vital role on well-being (Feeney & Collins, 2015). Social support is linked to positive biological profiles in that social support protects against the negative effects of changes in cardiovascular, neuroendocrine, and immune function. Furthermore, when exploring Autonomic Nervous System (ANS) function, higher heart rate variability has been shown to reflect a psychophysiological state compatible with social interaction (Quintana, Guastella, Outhred, Hickie, & Kemp, 2012). Social support has been shown to buffer against the negative effects of life stressors (Cohen & Wills, 1985), and ultimately, mortality (Holt-Lunstad, Smith, & Layton, 2010). In summary, social relationships are important for both health and well-being (see review: Cohen, 2004).

Alternatively, social isolation, social disconnectedness, and loneliness have been shown to have negative effects on health (Cornwell & Waite, 2009) as individuals who are socially isolated display not only psychological, but also, physical consequences such as: increased risk of inflammation and hypertension (Yang et al., 2016) and greater vascular resistance, slower wound healing, and poorer sleep efficiency (Cacioppo & Hawkley, 2003). In a neuroimaging study examining the effects of social exclusion on health, results show that “social pain is analogous in its neurocognitive function to physical pain” (Eisenberger, Lieberman, & Williams, 2003, pp. 292).
In college students, females report more stress from romantic relationships, relationships with their parents, and quality of peer relationships when compared to their male counterparts (Darling, McWey, Howard, & Olmstead, 2007). Concordantly, aspects of social well-being (i.e. need to belong) tend to have greater negative impacts on college-aged females when compared to males (Baldwin, Towler, Oliver, & Datta, 2017). Moreover, the quality of such relationships have both psychological (Umberson & Montez, 2010), as well as physiological (Heaphy & Dutton, 2008) ramifications on health.

In order to better understand the health and well-being of an individual, one should consider his/her relationship qualities and characteristics. Although much is known about the positive and negative consequences that relationships have on individual health such as: research is lacking regarding its connection between ANS function and domains of wellness (i.e. physical, social, emotional, spiritual, psychological, intellectual). It is critical to examine the effects of both quantity and extent of relationships in conjunction with health and wellness to truly understand the effects that relationships have on quality of life.

Poster # 544
A Preliminary Investigation: Social Problems and Executive Functioning in an ADHD Pediatric Sample
Kriston Laadan Ramsey

Student’s Department: Child and Family Studies
Faculty Mentor: Bolden, Jenn

Attention-Deficit/Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder that is linked to a number of cognitive deficits including executive function (EF) impairments (Barkley, 2012). EFs refer to a number of separate (but related) processes that guide everyday behavior. While existing research has focused largely on the relation between ADHD-related social problems and EFs in general, the present study is unique in that we examined the relations among ADHD symptoms, social problems, and eight specific EF domains: working memory, shifting, inhibiting, controlling emotions, planning and organizing, organizing material, monitoring, and initiating.

Parents of children aged 7-12 completed ratings of social problems, ADHD symptoms, and Executive Functions (N=30). First, we examined the relation between social problems and EFs. Next, we examined the relation between social problems and EFs after controlling for ADHD symptoms. Social problems were correlated positively with at least four EF domains: inhibition, shifting, emotional control, and monitoring (all ps<.05). After controlling for ADHD symptoms, however, social problems were not related to EFs (all ps>.05). Preliminary findings highlight the extent to which EF-related social problems are better accounted for by ADHD symptoms. To inform current models of ADHD, clinical and research implications will be discussed further in the study and future research will be mentioned.

Poster # 545
Facial Expressions: A Psychophysiological Exploration into Performance
Matthew Thomas Richesin, Michael Darnell Oliver, Olivia M Maples, Fadi Edwar Hakeem, Alona Hunter

Students’ Department: Psychology
Faculty Mentor: Baldwin, Debora R

Facial expressions influence both affective and cardiovascular responses to stress. However, previous research focuses primarily on positive expressions and is limited regarding additional facial expressions utilized on a day-to-day basis. This study examined an expression that is colloquially called a “Game Face”: which refers to a serious, focused, or determined facial expression. The current study examined whether or not Game Face expressions would influence psychophysiological
response and performance. In an investigation of physical performance and cardiovascular reactivity (Study 1), participants (N=62) were asked to complete the cold-pressor task. Study 2 tested cognitive performance utilizing a puzzle task. Participants (N=62) were divided into two groups and were asked to complete a puzzle. In both studies, one group was asked to make a Game Face, while the other was given no instruction related to facial expression. Results show no significant differences in performance on the physical task (F (1, 61)=.494, p=.485). In terms of cognitive performance, results reveal significantly better performance in the Game Face group (F (1, 61)=7.95, p=.008). Additionally, assessments of skin conductance show that participants who employed the Game Face during the cognitive task, displayed significant decreases from baseline following the puzzle manipulation (F (1, 61)=4.333, p=.042). These results suggest that employing a Game Face can positively influence psychophysiological stress response and cognitive performance. Furthermore, our results lend support to the theory that physical tasks involving some sort of extensive cognition may benefit from utilization of a Game Face prior to performance.

Tickle College of Engineering

Poster # 546

Mobile Device for Height Measurement of Research Cotton

Matthew Dalton Dischner, Christopher Landon Keller

Students’ Department: Biosystems Engineering

Faculty Mentor: Wilkerson, John B

Cotton plant height is an excellent indicator of vigor and yield. Currently, many producers use research plots to adjust various soil and moisture conditions to determine the impact on yield. A popular method of recording the heights in these plots involves laborers measuring the plants by hand, and recording the results on paper.

This design seeks to develop a device that uses an ultrasonic sensor to read and record plants’ heights while moving quickly through the research plot. The output signal of the ultrasonic sensor is run through an averaging and manipulation algorithm, and the final height is stored to an SD card. The recorded heights are stored in a .csv file to be easily retrieved and analyzed by the crops’ researchers. Plots are tagged with an RFID chip, and a corresponding RFID sensor on the device will read each tag and store the plot ID with each recorded height. With onboard processing and sensor consistency, the device creates a faster, more repeatable method of acquiring plant height measurements in research plots.

Poster # 547

Second Generation Mobile Biochar Unit Design

Samuel Thomas Long IV, Andrew Watts

Students’ Department: Biosystems Engineering

Faculty Mentor: Abdoulmoumine, Nour

The goal of this engineering capstone project was to design and construct a system to autonomously feed and control a biochar production system. A previous design team constructed a first-generation mobile biochar reactor prototype using down-draft gasification technology to convert woody construction site waste into biochar for use as a soil additive rich in organic carbon that increases water and nutrient holding capacity. This project improves upon the previous prototype by
addressing limitations in the first design, namely providing an automated feeding mechanism and enhancing the controls. Our second-generation design autonomously feeds woodchips from a hopper via a conveyor belt that supplies the inlet chamber of the biochar reactor equipped with two self-actuated doors that operate in series to maintain an air lock. An Arduino microcontroller governs the entire biochar producing unit by utilizing inputs from multiple sensors that monitor temperature, woodchip levels, exhaust gas quality, and the state of various actuators and fans. Arduino program control logic optimizes operating conditions to maximize biochar yields while ensuring that exhaust gases are fully oxidized for emission control. The resulting improvements to the biochar system provide the capability to produce biochar from woody biomass while requiring no manual input.

Poster # 548

The Design of a System to Georeference Underwater Video Utilizing Citizen Scientist Scuba Divers

Emine Nur Fidan, Miles Christopher Ownby, Natalie Peay

Students’ Department: Biosystems Engineering
Faculty Mentor: Ayers, Paul D

The need for a simple system of collecting georeferenced under-water videos in open waters has been long due. With increased ocean acidification and coral bleaching, the monitoring of our oceans is needed now more than ever. The goal of this project is to create a system that georeferences scuba divers and produces high quality data of our oceans. This project entails the construction of a dive buoy prototype that will house a hand-held GPS unit, contain a retractable line that will maintain the GPS afloat the water and in proximity to the scuba diver, and meets all safety laws and regulations. This design of a dive buoy system will allow for collection of high quality video of monitored coral reefs and allow for researchers to target areas of concern within the waters. The criteria for this system revolves around producing high resolution data; thus, success criteria for this system includes ability to determine the scuba diver location, capture video, integrate the GPS and the video, and develop ArcGIS based maps that include video playback. Specifically, the prototype must position a scuba diver within 3-meters of error at a 5-meter depth, it must also operate within 5-meters of error at 15-meter depth. Test conditions for this prototype operation include winds at <10 knots and current at <3 knots.

Poster # 549

Volunteer Landfill Leachate Treatment Design

Christina Danielle Cowan-Banker, Curtis Maffei, Michael Pelle

Students’ Department: Biosystems Engineering
Faculty Mentor: Buchanan, John R

Landfill leachate is water that percolates through the compacted solid waste and is withdrawn by sumps located within the landfill. Substances within the landfill become dissolved in this water resulting in a solution that is contaminated and is often rejected by local wastewater treatment plants (WWTP). Volunteer Landfill in Onedia, Tennessee has been innovatively treating their leachate before sending it off site with biological pretreatment and aeration, lowering the oxygen demand, as measured by biochemical oxygen demand (BOD) and chemical oxygen demand (COD); and the ammonia levels. However, during the winter months the cold poses a problem for pretreating the leachate due to reduced microbial degradation of the dissolved contaminants. By utilizing the heat from the methane flare, located within close proximity to the leachate tank, microbial pretreatment during the winter months could continue, saving Volunteer Landfill roughly $67,000 a year in surcharges from the local WWTP. An air to air heat exchanger was designed to transfer the heat from the methane flare to the leachate holding tank to maintain an optimal temperature for microbial pretreatment. The heated air is blown through microbubblers to aerate the tank, introducing oxygen allowing for aerobic biodegradation,
and lowering ammonia levels by off-gassing. A bench-scale prototype was constructed to evaluate the best temperature for BOD, COD, and ammonia levels from the leachate.

**Poster # 550**

**Reconstructed Implantable Limb Prosthetic**

*Lexus Morris, Samantha Z Brachter*

Students’ Department: Biomedical Engineering  
Faculty Mentor: Crouch, Dustin Lee

Problem:
Amputation causes loss of function and an overall decline in quality of life. Prosthetic limbs provide a solution, but many have restrictions on full range of restored ability. Most prosthetic designs have limited direct interface with the musculoskeletal system. They must be connected through a system of pulleys, electroencephalography (EEG), or electromyography (EMG).

Proposed Solution:
Orthopedic implants offer new limb replacement methods to address the limitations in common prosthetics. An implantable design will act to fully reconstruct or imitate a missing appendage from underlying bone structure to outer skin layer.

Goals/Objective:
Our goal was a preliminary implant design. We created designs for two different animal models: a prosthetic to replace a rat forelimb and test an osseointegrated attachment method and a rabbit hindlimb with a silicone sleeve to test tendon attachment methods.

Methods:
Computer-aided design (CAD) modeling in SolidWorks was used to design our prototypes. Designs were 3D printed using PLA filament.

Discussion/Conclusions:
Our next steps are to print the final model in titanium and begin an experimental tendon reconnection method to further investigate restoration of missing muscle.

**Poster # 551**

**Alex Haley Farm**

**Mitigation of River Bank Erosion**

*Garcia Jose Manuel Luna Garcia, David Blake Anthony, Christian Wayne Kidd, Jeremy Lee Melton, Chelsey Ann Brummer*

Students’ Department: Civil Engineering  
Faculty Mentor: Retherford, Jenny

Substantial bank loss attributed to erosion and urbanization of the region has created an undesirable and potentially hazardous environment at Haley Farm, in Clinton, TN. Upon review, the student team has deemed resolution of site
stability issues paramount. The Haley Farm, named after former owner Alex Haley, was acquired by the Children’s Defense Fund (CDF) in 1994. CDF is a 501(c)(3) nonprofit whose mission is to create an equitable future for all children.

A student design team from the University of Tennessee, Knoxville has been tasked with developing design concepts to address the needs of the farm. The approach to the restoration was holistic, as required by the nature of the issues. Testing of the site included flow measurements to model the behavior of the creek. Additionally, soil samples were extracted to obtain current geotechnical data to determine solutions for soil stabilization as well as the design of abutments for a bridge across Hines Creek. To quell the accelerated erosion of the bank, native vegetation will be implemented in the final design. Abatement of other effects produced by the creek flooding will include options for altering the culvert, including complete removal of control orifices.

Poster # 552

**Chandler Road-Airport Auto Auction Drive Roadway and Drainage Networks Improvements**

**Jackson Clark Oakes, Nicole Ruth Pearlman, Dylan C Jenkins, Justin Curtis Condon**

Students’ Department: Civil Engineering

Faculty Mentor: Retherford, Jenny

The City of Alcoa is interested in making improvements to the roadway and drainage networks of Chandler Road and Airport Auto Auction Drive to better service the businesses and community in the surrounding area. Airport Auto Auction Drive is a private road, owned by Airport Auto Auction and Chandler Road is a public road, maintained by the City of Alcoa. Cost estimations and traffic analyses were performed based on different design options to determine the best option for improvements. Economic and social benefits were also considered. Improvements or replacements to the drainage structures and systems, the retaining wall located along Airport Auto Auction Drive, and pavement were included in the cost analysis and estimation. To evaluate existing drainage conditions and to model improvement options, stormwater runoff analyses were performed using the Rational Method in Autodesk Storm and Sanitary Analysis. Superelevation calculations for roadway improvements were performed in Autodesk Civil 3D. The traffic analysis consisted of recording traffic counts for both Chandler Road and AAA Drive. These counts were compared to traffic counts for the adjacent roads: Airbase Road and Wrights Ferry Road which was recorded on TDOT’s website. Comparing the observed traffic counts to TDOT’s years of data allowed for the traffic projections for Chandler Road and AAA Drive to be extrapolated. The concerns related to the existing soldier pile wall located on AAA Drive stemmed from one buckled piling. The wall was evaluated to determine the structural stability based on the existing conditions of the displaced wall to determine the need for replacement or rehabilitation by performing maximum moments experienced by the piling, overturning moments, and active and passive pressures calculations. Recommendations for improvements were reported to the City of Alcoa.

Poster # 553

**Eureka Trail Expansion and Improvements Phase II**

**Michael Graham Feeney, Todd Anthony Huber, Erik John Perfetto, David Robert Dillard**

Students’ Department: Civil Engineering

Faculty Mentor: Retherford, Jenny

The City of Athens and McMinn County has recently acquired approximately six acres of land and 4.8 miles of retired railway property for further development of the Eureka Trail by the Athens Parks and Recreation Department. The Eureka Trail is a recreational trail for pedestrians and cyclists that will, through this project, connect the City of Athens to the Town of Englewood. The development of this trail into Englewood will help drive up local economy. Five miles of the trail has already been completed in Phase I of the project, with the remaining two miles of the trail needing completion in
Phase II. In order to complete Phase II, several tasks need to be performed. Designing an ADA compliant mini-park that will act as a trail way access point will need to be completed. The safe crossing of Highway 39 using TDOT standards is necessary. The execution of a bridge analysis and decking design for an existing trestle bridge will need to be completed. And lastly, a trail through Don Edgemon Park and into the historic, downtown area of Englewood will need to be designed. This complete design of the Eureka Trail will connect the City of Athens to the town of Englewood, increase quality of life for the locals, and create higher foot traffic into Englewood.

Poster # 554
Innovative Application of Limestone Fines in Landfill Berms
Zachariah Levi Arwood
Student’s Department: Civil Engineering
Faculty Mentor: Retherford, Jenny

The stone processing industry has faced the issue of producing a by-product of fines during various crushing stages since the industry's inception. Aggregate fines typically have very limited applications, and often require further processing to become suitable for these applications. Rogers Group, Inc., a processed stone supplier, recently collaborated with the senior design group, Aggregate Innovation Engineers (AIE), of the Civil and Environmental Department at the University of Tennessee, to investigate purposes for the limestone fines produced by the company during processing. After literature review spanning concrete, asphalt, water filtration, plastic production, and landfill gravity wall filler applications, a cooperative decision was made to explore landfill gravity wall filler applications, due to high volume of fines required, the ability to utilize the fines without further processing, and the positive environmental impact of vertical landfill expansion versus lateral expansion. To establish the viability of utilizing limestone fines for gravity walls, material properties relevant to gravity wall design were investigated including: shear strength, cohesion, internal friction angle, and particle size distribution. The properties were then used as parameters to design a landfill gravity wall that Rogers Group could integrate into marketing materials to encourage sale of the limestone fines.

Poster # 555
Rails-to-Trails Greenway Expansion in Maryville, Tennessee
Matthew Ryan Davis, Sydney Katherine Reeder, Jeffrey Blake Floyd, Jacob B Gasnow
Students’ Department: Civil Engineering
Faculty Mentor: Retherford, Jenny

D.T.S. Engineering was requested by the City of Maryville to expand upon its greenway trail by connecting surrounding neighborhoods North of East Harper Avenue in Maryville, Tennessee, to the surrounding city center. The project requires the inspection and likely replacement of two wooden trestle bridges along the proposed trail site following an abandoned railway bed. The city has asked that D.T.S. Engineering to investigate replacement alternatives for each of the wooden trestle bridges and to ensure that the greenway trail meets compliance with the American with Disabilities Act (ADA) and Public Rights-of-Way Accessibility Guidelines (PROWAG) standards. Alternative options for the potential East Harper Avenue Bridge replacement include filling the existing grade and eliminating the need for the bridge, replacing the bridge with a concrete box culvert, or designing a new vehicular bridge. All of these options were included in a cost comparison evaluation to identify a preferred alternative. The second bridge crossing over East Broadway Avenue was redesigned into a steel pedestrian bridge. Other pedestrian crosswalks that did not require bridges were designed at Wright Road, Everett Avenue, and Sevierville Road. The greenway trail, bridges, and crossings included design and analysis calculations from construction, structural, geotechnical, transportation, and water resources engineering disciplines. The City of
Maryville hopes that this expansion will allow new access to the greenway trail and will continue to boost the economy around the city center.

**Poster # 556**

**Roadway Improvements for Project Python Meteor Access**

*Samuel Paul Rodgers, Ethan Benjamen Miller, Case Alexander Offutt, John Michael Wilson*

Students’ Department: Civil Engineering  
Faculty Mentor: Retherford, Jenny

TDOT and the city of Alcoa, TN are needing to hire a new client for an industrial development project. They are able to hire CEMS Engineering through the State Industrial Access Program (SIA). This program provides funding for highway access to new and expanding industries across the state. Engineering services are needed to improve the surrounding infrastructure of Project Python Meteor. TDOT has tasked our company, CEMS Engineering, with the roadway design, storm water management, traffic signalization, and overall safety of this SIA. The roadway design aims to improve the intersection on State Route 334. These improvements need to be made adequate for WB67 trucks to access Proffitt Springs Road and will align with the AASHTO Greenbook standards. Also, a traffic analysis will be run to decide if right and left turn lanes on State Route 334 will be needed to reduce congestion. With the addition of the turn lane on Proffitt Springs Rd and the design having 12 foot lanes, the existing culvert will need to be demolished and reconstructed. The new design for the culvert will follow the D-PG-4 design standards in the TDOT manual. A no-rise analysis will consider the hydrological impacts of redirecting the unnamed tributary branch of the TN River.

**Poster # 557**

**The Harbor of Loudon**

*Maxwell Robert Carter, Nathan Ismail Kabir, Elijah Seth Roberts*

Students’ Department: Civil Engineering  
Faculty Mentor: Retherford, Jenny

The Harbor of Loudon is the senior design project of a group of civil engineering students. The team was tasked with designing a marina on the Tennessee River in downtown Loudon, TN. The goal of project is to bring economic growth to the area by attracting the recreational users of Watts Bar Lake to use marina services like vessel fueling and waste dumping and access to dining from lake. There is currently not a fueling facility on the upstream portion of Watts Bar Reservoir. Two of the major challenges of the project were regulatory approval of the design and creating a feasible resolution to the utility relocation. Throughout the project, students have meet with mentors from the Tennessee Valley Authority, Army Corps of Engineers, Loudon Utility Board, Tennessee Department of Environment and Conservation and professional engineers from around the area to guide them with their design. The final deliverables for the project are a set of complete construction drawings and a detailed engineering report discussing all of the elements of their design. Existing site conditions contained a creek flowing through two large floodways separated by a road and culvert. To make the site navigable to boaters, they plan to remove the road and the culvert and dredge the floodways. Thru traffic will be diverted to other streets around the site. Dredging is required to allow enough depth in the harbor for motorboats to maneuver. The students performed their own survey of the site. The design gave students the opportunity to use and improve their skills in the fields of water resources, geotechnical, and transportation engineering. The marina banks needed to be protected from rising and falling reservoir levels with stable design. A retaining wall was designed to increase the navigable area of the harbor. Some utility lines running through the site had to be rerouted to prevent them from interfering with marina activities. An existing sanitary sewer pump station on site provided
ACS Transmission Tower Design

*Williams A King, Morgan Christen Jenkins, Trenton Michael Wiles, Liliana Carolina Porras, Matthew Tyler Livesay*

**Students’ Department:** Civil Engineering  
**Faculty Mentor:** Retherford, Jenny

Transmission Towers, commonly constructed with steel, often stand in stark contrast to the surrounding environment. These structures typically have been designed with a focus on functionality over aesthetics. This project was designed for the Aesthetic Competition Series. While the competition had specific parameters for the transmission tower the team decided to limit the material to timber. The aesthetic design concept is inspired by nature and is visually abstract; this combination allows a single design to be incorporated in harmony with both urban and rural location considerations. Collaboration with both forestry professionals and architects helped build the motivation to demonstrate the viability and versatility of timber in contrast to other common construction materials such as steel. Wood is a natural renewable resource with a higher weight to strength ratio than steel. Within this project, the proposed wooden structure is compared to a similar steel structure to assess the practicality of utilizing timber for transmission tower construction. Structural, geotechnical, and construction engineering analyses were completed along with a life cycle analysis for both steel and timber. The evidence provided from the analyses within this work will help inform engineers about the differences of utilizing steel or timber for future transmission tower designs.

Neyland Drive Traffic Study

*Evan Ray Lockhart, Colin Thane Williams, Clark Bowman Marshall, Colton Kraemer Scott, Frank Henry Becker*

**Students’ Department:** Civil Engineering  
**Faculty Mentor:** Retherford, Jenny

Cities across the state, such as Nashville and Chattanooga, recently integrated their riverfront property into economic centers for people to congregate, but Knoxville has not been able to employ the Tennessee River as a resource in this way. Neyland Drive, a 4.5 mile four-lane highway, hugs much of the northern shoreline of the river and eliminates potential economic development from occurring by limiting available space. The University of Tennessee Landscape Architecture department in association with the Tennessee River Studio has proposed several design scenarios that reduce the number of lanes on Neyland Drive to allow for future development along the Tennessee Riverfront. This future development could include infrastructure such as mixed-used developments to greenway extensions and beautification projects to try attract foot-traffic to the Tennessee River. CHECK, a student team of design engineers, was contacted to assess multiple lane reduction scenarios and identify a design solution(s) that offers the ability to enhance the waterfront without harming the regional traffic system. While evaluating the various design scenarios, CHECK considered numerous attributes including roadway Level Of Service, corridor travel time, practicality, space attained, network absorption count, and cost analyses to guarantee that the best options were considered for future construction.

The Effects of Vortex Oxidizer Injection on Hybrid Rocket Fuel Regression

*Robert A Nickel, Nicholas Kearse, William Putthoff, William Kobler, Sara Martin, Benjamin Barnhill*
While most modern rockets utilize either solid or liquid propulsion systems, hybrid rockets utilize a combination of solid fuel and a liquid oxidizer to offer a high-performance compromise between the complexity and expense of liquid propulsion and the unforgivable nature of solid rocket propulsion. The simplicity of the system minimizes required ground support equipment compared to liquid propulsion systems while also allowing increased safety compared to solid rocket propulsion and the ability to regulate thrust. Hybrid rocket technology has existed for at least 75 years, and in this time a plethora of research has been done with various fuels. Utilizing metalized paraffin fuel, researchers have achieved performance comparable to liquid rocket propulsion, but fuel regression rates with traditional oxidizer injection systems leave much to be desired. By utilizing vortex oxidizer injection, the centrifugal force applied to the oxidizer allows for greater combustion efficiency compared to standard axial injection systems. Given the possibility of solving the greatest drawback of hybrid rocket propulsion, our team committed to developing a low-cost method of implementing these high-performance injection systems as upgrades to pre-existing rocket engines, and in testing achieved a 40% increase in performance over unmodified engines.

Poster # 563
Evaluation of Polypropylene Blends for 3D Printing Applications
Madeline G Wimmer, Daniel Joseph Rutstrom, Cody Lee Pratt, Lifu Zhang

Polypropylene (PP), sometimes referred to as “the new mild steel”, is less expensive, lighter, has a higher strength-to-weight ratio, and boasts improved chemical resistance over ABS or PLA while maintaining similar strength, durability, and elongation. Unlike ABS or PLA, PP cannot be additively manufactured due to its rapid crystallization inhibiting interlayer bonding. By changing the polymeric composition of isotactic polypropylene (iPP) through the addition of a malleated copolymer (PP-g-MA) and atactic polypropylene (aPP), the overall crystallization rate can potentially be depressed. Initial tests will be conducted on 8 iPP blends with 8, 10, 12, and 14 wt% PP-g-MA and 1, 3, 5, and 7 wt% aPP added to determine the ideal ratios of the two additives. These will be used for additional blends with both PP-g-MA and aPP in the same iPP matrix. Preliminary results using differential scanning calorimetry (DSC) show uniform compositions after blending with a twin-screw extruder. After re-extruding the pelletized filament with a single-screw extruder to produce a uniform diameter, further DSC and melt flow rate (MFR) testing will be evaluated to understand temperature and viscosity changes. Success will be determined by evaluating the filaments' ability to print a standardized testing shape on a 3D printer.

Poster # 564
Exploring Au-Ni Alloys for Magnetic-Plasmonic Applications
Brandon Davis Rowell, Christopher Cole Walker, John Caleb Carothers, Michael David Roulier

Magneto-plasmonics seeks to understand how magnetic fields can influence the optical properties of certain materials at the quantum level. This understanding can be used to improve technology involving optical interactions such as efficient solar energy harvesting, high density memories for computers, and medical imaging, among other applications. The magneto-plasmonic properties of a gold (Au) nickel (Ni) thin film were characterized in this study. This system was chosen for the unique magnetic properties of Ni and the propensity of plasmonic interactions in Au. A film was synthesised via a
co-sputtering combinatorial process that resulted in a compositional gradient. This film was subjected to energy dispersive spectroscopy (EDS) and x-ray diffraction (XRD), to allow for compositional and structural characterization across the film. EDS confirmed this gradient and XRD indicated the presence of metastable states. Ellipsometry was utilized to determine the change in the refractive index and the dielectric constant as a function of composition. Future experiments will involve annealing a separate film in order to observe the relationship between microstructure and magneto-plasmonic optical properties moving along the gradient. If time permits, magnetic testing will be performed in order to determine the magnetic contribution of Ni to the system.

Poster # 565

Formulations for Three-way Catalyst Supports in the CeZrLaO System

Quentin Alexander Eustace, Christina Lynn Cox, Grant Christain Hanthorn, Caitlin Jeanette Duggan

Students’ Department: Materials Science & Engineer Faculty Mentor: Keffer, David J

Toxic gases and pollutants are produced from fuel used during the operation of an internal combustion engine. Carbon monoxide, nitrous oxides and unburned hydrocarbons are the most detrimental produced and can be managed with a heterogenous three-way catalyst (TWC). It is capable of oxidizing and reducing simultaneously receiving its title from those three pollutants. Noble metals such as Pt, Rh, and Pa act as the catalyst in these reactions. These metals need uniform dispersion over a large surface area. Gamma-alumina is employed as the support along with a formulation of ceria, zirconia and lanthana (CZL) to store and supply oxygen. Ceria’s transition of its oxidation states is essential in this system. Advanced Catalyst Systems, LLC are experimenting with a coprecipitation process of their CZL formulation and seeks to understand a significant performance enhancement. In this work, we investigate the structure, the missing link in Processing-Structure-Performance relationship. The structure is investigated at both the microstructural and atomic level using a variety of characterization techniques, including transmission and scanning electron microscopy, x-ray diffraction and particle size distribution.

Poster # 566

Investigation into Failure Mechanisms of John Deere Manual Transmission Shifter Forks

Austin Quang Tri Ngo, Christian Andrew Kocak, Gavin Hunt Dorrity, Xiaoyang Hu, Cameron Thomas Hilliard

Students’ Department: Materials Science & Engineer Faculty Mentor: Sickafus, Kurt Edward

Shifter forks are essential parts in the manual transmission systems commonly used in automotive, agricultural, and construction machinery. Several shifter fork assemblies, built at John Deere Coffeyville Works (JDCW), fracture after only a few hours in service, much lower than the expected lifetime of the part. The shifter fork fracture can prevent gear shifting and ultimately cause total failure to the transmission. For a senior design project in MSE 489, our team is focusing on identifying the cause of shifter fork failure. Ultimately, our goal is to propose design improvements to reduce the probability of fracture in the shifter fork assembly. We are examining shifter forks, which are low-carbon steel plug & plate pieces welded with stainless steel, using a methodology known as failure analysis. Our failure analysis process includes characterization of alloys and microstructures, as well as stress testing newly manufactured shifter forks to reproduce failures. We will present results of our shifter fork analyses based on hardness testing and metallography. In addition, we will propose possible design improvements such as the use of different weld filler metals, additional heat treatments, or introducing different processing techniques.
Poster # 567

Advancements on Spent Fuel Pools through Passive Cooling

Jonathan Daniel Hartman, Gavin M Webb, Christopher Robert Duff, Tyler M Naughton, Sean Keith Alcorn

Students’ Department: Nuclear Engineering
Faculty Mentor: Grossbeck, Martin L

This project addresses the Fukushima accident where spent fuel pools lost forced cooling and overheated. Although fuel was never uncovered in the accident, it was just a matter of time before boil-off and rapid evaporation would have led to exposed fuel and consequent fuel melting. A system is being designed to use the radiation from the spent fuel to power back-up circulation pumps to cool the pool water. Exposed spent fuel rods can emit strong damaging radiation, particularly gamma rays, and can quickly lead to a significant safety concern. Therefore, the goal of this project is to utilize gamma production in the spent fuel to cool itself and prevent such a fuel melting accident. It is proposed to install solar cells within the fuel racks to produce electric power to operate circulation pumps. Solar cells are optimized for visible light. Gamma rays and any other photons with energy greater than the band gap of the solar cell semiconductor will generate charge carriers and therefore enable a current, but energy greater than the band gap is lost. In addition, the interaction cross section for gamma rays decreases with increasing energy resulting in many of the photons penetrating without interaction. These problems can be solved by using a plastic scintillator similar to those used in radiation detectors. This external system could be applied to existing nuclear power plants and contribute to preventing another event similar to that at Fukushima.

Poster # 568

Robust and Cost Efficient Method for Fabrication of Tungsten Tips for Scanning Tunneling Microscopy

Bahar Meshkat

Student’s Department: Biochem/Cellular/Molecular Bio
Faculty Mentor: Khomami, Bamin

The quest for green energy has sparked considerable interest plant biology, specifically in Photosystem I. PSI is the photosynthetic protein complex that acts as a nano-scale biological photodiode and allows for light-activated charge separation to facilitate unidirectional electron flow. This light-activated charge separation has nearly 100% quantum efficiency. The structural and photo-electrochemical properties of PSI allow it to be suitable for incorporation into bio-electronic or hybrid photochemical devices. Prior to this advancement, the first step towards the rational design of such revolutionary devices requires a fundamental understanding of the morphological and electronic properties of PSI on various donor substrates/electrodes. This aspect sparked the interest of STM research. Scanning Tunneling Microscopy (STM) is a powerful scanning-probe technique that allows simultaneous high-resolution analysis of localized topography and charge transport properties of at atomistic resolution. To this end, preparation of quality STM tips is critical in acquiring high quality images and in turn tunneling current of PSI nanostructures. Such demand for high-precision STM tips has launched the exploration of many techniques used to produce STM tips with uniform and controlled tip radius and geometry. These multiple methods are marked by distinct parameters which demand highly specific configurations. Our highly developed method in particular, facilitated by electrochemical (EC) etching of tungsten wire, allows the creation of sharp and clean STM tips via judicious selection of the process parameters. This method takes into account the chemical and physical properties of tungsten wire to create consistent replicates of STM tips. The tips are prepared, etched, and insolated with particular methods. In this presentation an overview of our novel device that produces robust, efficient tips that provide the design and operation of our affordable, cutting-edge
alternative to costly manufacturing of STM tips will be discussed.

Poster # 569

A Synopsis of Studies on Steel-Timber Composite Structures

Harrison Takuya Ooi

Student’s Department: Civil Engineering
Faculty Mentor: Denavit, Mark David

Steel-timber composite structural systems are capable of providing high strength and ductility for commercial and residential buildings. The combination of steel, a highly recycled material, and timber, a renewable resource, can also be a more sustainable and environmentally friendly alternative to traditional methods of construction. Steel-timber composite structures have become a topic of recent and growing research interest with an ever increasing volume of relevant results becoming available. In this work, a broad range of research on these innovative structures is identified, categorized, and summarized. The studies are divided into three major categories: walls, floor systems, and a specific framing system known as Finding Forest Through Trees. Each major category is broken down into more detailed subsections, giving the reader a better understanding of the state-of-the-art of steel-timber composite structures. The results of this work provide an overview of the research findings on the topic of steel-timber composite structures with the goal of exposing a wide range of students, researchers, and practitioners, to this innovative structural system.

Poster # 570

Comparison of Traditional and Advanced Methods of Evaluating Roof Ponding

Morgan Christen Jenkins

Student’s Department: Civil Engineering
Faculty Mentor: Denavit, Mark David

The accumulation of water on roofs can cause progressively increasing deformations and even collapse. Water gravitates to low points in a roof, resulting in nonuniform loading that is dependent on the deflected shape of the roof. This effect, known as ponding, is a design consideration for all buildings. The most commonly used method of assessing roofs for ponding was developed over 50 years ago and has many limitations. For instance, it is not strictly applicable to roofs with slopes, despite the fact that minimum roofs slopes are required for all buildings. A new method of design has recently been developed which more accurately captures the behavior of roofs under ponding conditions through computer analysis. The new method provides more accurate solutions and is applicable to a wider range of cases while still being simple to use for practicing engineers. In this work, the traditional method is compared to the new advanced method for a set of practical examples. The results will quantify the differences between the two methodologies with the intent of informing engineers as they decide which method to employ for a design.

Poster # 571

Fine Coal Refuse Slurry: Influence of Background Chemistry on Viscosity

James Edward Throckmorton

Student’s Department: Civil Engineering
Faculty Mentor: Palomino, Angel

Fine coal refuse is a by-product of the coal mining process. A flocculant is added to the material to accelerate consolidation. However, the flocculant addition changes the effective grain size distribution.
This material was collected as a suspension from the coal mine without alterations for testing purposes. The solids in the suspension were approximately silt-sized (~mm).

The purpose of this study is to investigate the influence of the supernatant chemistry and solids content on the rheological properties of fine coal refuse slurries. Coal refuse at different concentrations was mixed with various background solutions: as-received supernatant, distilled water, and a dispersant. The viscosities of these mixtures measured over a range of rotational speeds with time. All suspensions were observed to have shear-thinning to near-Newtonian behavior.

**Poster # 572**

**Development and validation of a nonlinear inelastic model for slender reinforced concrete columns**

*Aston Martin Hutchison*

Student’s Department: Civil Engineering  
Faculty Mentor: Denavit, Mark David

Methods of designing structures have evolved over time with the ever increasing power of computer hardware and analysis software available to engineers. New methods or changes to old methods are often justified by comparisons to existing methods. As these changes accumulate, it is prudent to occasionally verify the methods in a more rigorous manner. One area which may be overdue for such an evaluation is stability and strength behavior of slender reinforced concrete columns. A robust evaluation of the current design provisions requires computational models running broad parametric studies. However, for this research to begin, a reliable analytical model needs to be in place. The goal of this work is to develop a model for slender reinforced concrete columns loaded monotonically to failure and to validate the model against published experimental results. The model is developed within the OpenSees framework using published constitutive relations for steel reinforcing bars and confined concrete. Validation of the model is made through a comparison between experimental and analytical load-deformation curves for a suite of specimens representing ranges of column length, concrete strength, reinforcing ratio, and other relevant parameters.

**Poster # 573**

**Numerical Modeling of Particle Fracture**

*Jeremy Lee Melton*

Student’s Department: Civil Engineering  
Faculty Mentor: Alshibli, Khalid

Particle fracture is integral to the constitutive behavior of soils. Deformation and failure of soils are largely influenced by the fracture of individual particles. Analysis of failure modes in a laboratory setting can be costly both fiscally and temporally. Numerical models could eventually replace these costly experiments. These models can eventually be used to model larger samples and systems.

To create the model, it was necessary to monitor particles under high strain rate loading. It is under high strain rate loading that the particles are likely to experience failure in the form of fracturing. Prior to loading, three-dimensional tomographic images were taken of each particle. After loading the pieces of the particle that remained were also imaged. These images were vital in comparing the mode of fracture between the experimental result and results produced by the created model.

The created numerical model was intended to mimic brittle fracture via finite element analysis. Each particle’s failure was compared to experimental data by inspecting mode of failure, force-displacement curves, and deformation relative to an
ideal sphere. The model worked well with particles that had points of contact with large surface areas, but was less effective with particles that had sharp contact points.

Poster # 574

Part-Based Detection of Excavators for Construction Safety Monitoring

Kadee Klimowicz, Harrison Takuya Ooi

Students’ Department: Civil Engineering Faculty Mentor: Li, Shuai

The construction industry continues to have a high number and rate of fatalities compared to other industries. In 2015, the fatal injury rate per 100,000 employees was 10.1 in the construction industry. The 937 fatalities claimed in the construction industry represented 21.4% of all industry worker deaths. 75% of struck-by fatalities in construction sites involve heavy equipment/machine and poor visibility. Therefore, there is a pressing need to address this significant problem. This research aims to detect the components and track their movements of an excavators by computer vision algorithms. Datasets of excavators working in various settings are collected, segmented and labeled for training. The convolutional neutral networking algorithm is implemented to recognize the parts of the excavator. Field experiments are conducted to validate the method and evaluate its performance.

Objectives of Project

1. Analyze Blitznet code via GitHub, extract and download appropriate subsets, data files, model training, coding softwares that are compatible with the program
4. Run Blitznet demo, piece by piece, testing a model already trained by owner, understand python language in coding software
5. Create a detailed varied data set of images of first prediction: excavator
6. Train the AI via neural networking creating our first model
7. Half portion training: test the prediction sensor with half of never before tested data
8. If successful, use the “create, train and test model” process with greenery (summer season tree data sets)

Poster # 575

The Effects of Pressure on Chemical Interactions with Shale Rock During Hydraulic Fracturing

Leah Frances Stephens

Student’s Department: Civil Engineering Faculty Mentor: Palomino, Angel

This research focuses on hydraulic fracturing, or fracturing, specifically the interaction between the chemicals used in the fracting fluid and the shale during the fracting process. In fracturing, oil or gas is extracted from fissures in subterranean shale rock. The fissures are made by injecting liquid into a well and applying high pressure. However, little is known about the impact of shale on the fracting fluid quality. Further understanding of the shale-fracting fluid chemical interactions is needed to develop more appropriate and efficient fracting fluid disposal practices. For this study, a series of high pressure experiments were conducted on shale-fracing fluid suspensions. Crushed Marcellus shale was added to a pressure vessel with one of four solutions: water, hydrochloric acid, persulfate, and hydrochloric acid and persulfate. The suspensions
were then placed under 3,000 psi of pressure for 8 days, the mean contact time during the fracing process. The solids were analyzed using SEM, XRD, and PSA to identify changes in particle and chemical characteristics. The liquid samples were analyzed using ICP and pH to quantify changes in water quality. These results will be utilized to show how pressure influences the chemical reactions in the fracing fluid.

**Poster # 576**

**Expanding Our Aromatic Waste Degradation Platform**

*Jared Clark Clements, Ralph Bermejo Laurel, Matthew R Kubis, Katherine Lynne Krouse, Neel Jayantibhai Patel, James Courtland Ragland, Elyssa Faith Ridley, Abbigail Elaine Link, Thomas Maxwell Welker, Jay N Patel, Annabel Li Large*

Students’ Department: Chemical Engineering  
Faculty Mentor: Trinh, Cong

Crude oil processing produces toxic byproducts, such as benzene, toluene, and xylenes capable of contaminating groundwater and soil leading to potentially serious health risks for both humans and wildlife. As a result, the effective removal of these hazardous organic compounds is imperative towards protecting natural resources. While it is possible to manually clean contaminated sites, such efforts are costly and time consuming. Our project seeks to degrade the toluene-based contaminants into valuable aromatic aldehydes by expressing the xyl ortho pathway from Pseudomonas putida in E. coli. As a continuation of our 2016 project, the 2017 UT-Knoxville iGEM team aims to use synthetic biology and metabolic engineering techniques to further develop our bioremediation strain by (1) creating an on/off switch through the implementation of the Pu promoter for the xylAMB pathway, (2) determining potential homologues for the TOL pathway from Pseudomonas stutzeri OX1 and Acinetobacter calcoaceticus, and (3) designing an efflux pump system by which E. coli can expel the desired aromatic benzaldehyde products.

**Poster # 577**

**Innovation of Analytical Methods in Art Conservation**

*Jose Nicolas Velasco*

Student’s Department: Chemical Engineering  
Faculty Mentor: Kit, Kevin M

Art conservation and restoration has been a delicate and intricate task for many years. To retain the high value of the artist’s original workings, art conservators are required to work in a non-invasive manner. The innovation of understanding materials down to the molecular level has greatly improved many areas including art conservation. Through literature review, it has been noted that analysis such as Raman spectroscopy and IR spectroscopy have been used to identify degradation agents on works of art (Hahn, 2012). Unilateral NMR is a new technique that has been considered as a tool for non-invasive analysis (Del Federico et al., 2010). This research investigates what techniques have been used to analyze paintings and what other techniques could be applied in the future. The advantages and disadvantages of a few of these techniques will be compared to determine the optimal usage of each technique. The goal of this research is to layout a set of experiments that can be conducted to further the understanding of these analytical methods when applied to art conservation.
Utilization of 1-D Spatial Information from Laser-Induced Breakdown Plasma for Determination of Fuel/Air Ratios

David Barnes

Laser-induced breakdown spectroscopy (LIBS) is a rapid, analytical technique that provides elemental analysis of gaseous, liquid, and solid matter, and is widely-used for detailed elemental composition analysis, including by the Curiosity rover on Mars. Furthermore, LIBS has been a very popular tool for investigation of combustion phenomena, most notably for plasma assisted ignition and fuel-to-air ratio (FAR) measurements. In this work, 1-D spatial information combined with spectral information from a Czerny-Turner spectrometer is used to analyze the distribution of Hα(656 nm), NII(568 nm), and OI(777 nm) spectral emissions along the laser-induced plasma in a methane-air flame to demonstrate the capability of using LIBS for 1-D FAR measurements. Nano-, pico-, and femtosecond laser-induced breakdown plasmas are investigated to show the effect of laser pulse width on the distribution of Hα, NII, and OI emissions and to understand the level of precision expected for each case. Furthermore, calibration curves are generated which can provide FAR information from appropriate spectral emission ratios.

A Virtual Testing Environment for Brain-Controlled Vehicle

James Howard Cate, Jinxiao Yu

Brain computer interface (BCI) is an emerging field with the goal of controlling computer programs and robotic devices using brainwaves. As an important application of BCI, neuro-rehabilitation aims at recovering physical movements from one’s brain activities for patients with disabilities, especially amputees and stroke victims. This project developed a portable, simulated virtual reality environment that works as a testbed for brain-controlled vehicles. The environment consists of a graphical user interface, a data acquisition protocol and platform, decoding algorithms, and a 3D racing car with tracks/goals for testing performance. The GUI and the algorithms are developed in MatLab. The virtual car is implemented in Unity, allowing cross platform and VR support. Signal communication between Unity and MatLab is achieved in real time through UDP protocol. The developed testbed can be used as a platform for testing and developing other BCI protocols and algorithms and has the potential to be used as a rehabilitation tool to train subjects with brain disorders to improve both memory and attention. Observations made and tests run in this virtual space accurately model behavior of analogous physical systems, with a fraction of the cost and setup time. This has been shown through multiple stages of testing across various well-known brain-control paradigms such as Imagined Body Kinematics and Steady State Visually Evoked Potentials. The authors aspire to make neuro-rehabilitation training available to more researchers and patients in order to increase the progress and impact of this life-changing technology.

Stoichiometry effects on matrix stability in simplified five-component borosilicate nuclear waste glass studied by Total Neutron Scattering and Raman spectroscopy

Adriano Fernandes Santos Filho, Igor Maximovich Gussev

Stoichiometry effects on matrix stability in simplified five-component borosilicate nuclear waste glass studied by Total Neutron Scattering and Raman spectroscopy

Adriano Fernandes Santos Filho, Igor Maximovich Gussev
Safe encapsulation of nuclear waste materials is a pressing environmental challenge that modern society faces. The waste form must retain its immobilization matrix properties and prevent diffusion of radioactive materials into the environment on a timescale of tens to thousands of years. Therefore, the critical point of searching for a reliable waste form is a deep understanding of structural properties of a waste form. Borosilicate glass is a widely accepted material for immobilization of either spent nuclear fuel or high-level waste generated by nuclear fuel reprocessing process. Borosilicate glass can accommodate the complex chemistry of waste into the borosilicate network, and the synthesis process is relatively simple and developed. The crucial question is how long the glass will remain as an effective immobilization matrix and how self-irradiation will impact the stability of the material.

The current study uses a simplified five-component borosilicate glass, consisting of Al2O3, B2O3, CaO, Na2O, and SiO2. There are 4 different compositions used in this study; the concentrations of Na2O and Al2O3 are varied from the base composition at the expense of remaining components to influence the glass network, mainly ratio of bridging to non-bridging oxygens.

Current work shows Raman spectrometry and neutron total scattering results on the stoichiometry-induced changes in borosilicate matrix by means of pair-distribution function analysis. Due to its amorphous structure, glass materials have the extremely limited local structure (1.5 to 6 Å) and no mid-range or long-range structure. Therefore traditional diffraction techniques such as Neutron or X-Ray diffraction that are commonly used for crystalline materials cannot be applied. Instead, “small-box” pair-distribution function analysis and Raman spectroscopy are used to get an insight into the local structure.

Poster # 581

Device Characterization of Gallium Nitride Solar Inverters

Katelyn Alexandria Bolinsky

Student’s Department: Electrical Engineering

Faculty Mentor: Costinett, Daniel Jes

Solar energy is one of the most significant research thrusts in the modern era. Solar inverters are devices used to convert the DC energy of sunlight into AC energy that can be used on the power grid. Typically, they contain silicon; however, new substances such as silicon carbide and gallium nitride are being tested. These materials could increase the efficiency of solar energy, decrease the overall cost, and are potentially more durable than silicon. In order to determine if these new substances can actually benefit the solar industry, they need to be characterized for different attributes with different parameters. As such, my research has been focused on testing these gallium nitride inverters with different packaging to determine different attributes of the devices and finding a new method of storing the data gathered so that it can be easily searched and implemented into the industry with greater ease.

The two main types of testing done on these devices are static and dynamic characterization. Static tests show the behavior of the device when it is fully turned on or off, measuring losses in the device while it is in use. Dynamic tests show how the device works while it is switching between being on and off, measuring the power loss.

With this data, it has become necessary to create a database with searching capability, making it easier for these devices to be analyzed. Having a database like this allows for not only the university, but also the industry in general to keep from repeating tests when the data has already been gathered.

The results gathered so far demonstrate the principle of overshoot present in the devices during shut off, an internal resistance that increases with temperature, and a switching loss, all of which are still being analyzed for exact values relative to silicon and silicon carbide while factoring in cost analysis.
Poster # 582

**Accelerated Thermal Transport Design of Aluminum Alloy via Machine Learning**

*J Dean Blanks*

Student’s Department: Mechanical Engineering  
Faculty Mentor: Shin, Seungha

Precipitation-hardened cast aluminum (Al) alloys are widely used in industrial applications due to their favorable combination of lightweight and strong characteristics. While precipitates increase mechanical performance, their increasing density indirectly affects the thermal transport of the alloy. The finite element method (FEM) has proven itself effective in simulating the thermal behavior of these alloys by addressing microstructural features; however, recent advances and trends in data science could offer an expedited approach for prediction and design of thermal properties. By using a Python script to automate the geometrical generation and location of the precipitates in ABAQUS, extensive data on various geometrical parameters (e.g., precipitate size, thickness, aspect ratio) and thermal transport has been created and validated by experimental results of Al RR350 and Al 319. Correlation analysis of this data has quantified the influences of various descriptors on thermal transport and shown the significance of surface-related descriptors, such as the diameter of precipitate. Machine-learning models have been trained using FEM data, and the trained model predicts thermal properties accurately without additional FEM simulations. If consistency can be obtained on future works of greater scale, the scientific community will be aided in its pursuit to more fully understand the effects of these precipitates, and the design process for alloys with desirable thermal properties will be expedited.

Poster # 583

**Analyzing memcapacitive capabilities of lipid and polymer bilayers for use in smart materials**

*Megan Elise Pitz*

Student’s Department: Biomedical Engineering  
Faculty Mentor: Sarles, Stephen Andrew

Neuromorphic engineering involves designing artificial neural systems that mimic the way neuron circuits in the brain process information and make computations. It took the fourth most powerful computer in the world (with 705,024 processor cores and 1.4 million GB of RAM) 40 minutes to simulate just one second of human brain activity. This shows a clear difference of energy use in the human brain versus modern computers; neuromorphic engineering could be how we mimic the computing power of the brain to create energy-efficient, neuron-based computers. Memristors and memcapacitors are proposed circuit elements with memory components. Memristors have been extensively studied in the past and have already been used in artificial neural networks. However, much less research has been done with memcapacitors. We have studied static lipid and polymer bilayers in the past, but our goal with this experiment is to dynamically test bilayers of different lipid or polymer makeup in various oils and then to compare which combinations exhibit the best memcapacitive capabilities. Bilayers will be tested using AC voltage and analyzed based on resulting current. With the combinations that exhibit strong memory capability, the next step will be determining how to incorporate these bilayer systems into soft smart materials.

Poster # 584

**Investigation into the Variability of Fused Deposition Modeling 3D Printers from the Same Manufacturer**

*William Clay Buttrey, Gabrielle Tessa Witt*
Variability of 3D printing is an issue that is becoming more apparent as more companies develop their own software and hardware for 3D printers. Since common stl files are used to print the same object on different printers, there is a need to analyze the differences in printers in order to anticipate and compensate for inherent differences between machines. Other studies have compared the physical dimensions of objects printed on different printers, but little information about the difference of mechanical properties exist. This paper will look at the variability between printers of the same manufacturer, Lulzbot, by comparing ASTM D638-14 type 5 tensile bars printed on each printer. The bars will be printed in one of three principal directions: XY, YX, and Z. The materials that will be printed are ABS-CF and ABS as they are the most commonly printed materials which will provide more relevant results. Each specimen will then go under a tensile test utilizing DIC (digital image correlation) to see how the specimens act under stress. The results will quantify the discrepancies between the mechanical properties of the same printed files from different printers, specifically Young’s Modulus and ultimate tensile strength. The results will inform future researchers and engineers which printer should be used to obtain desired properties.

Poster # 585

Optimization of Skin Panels to Prevent Buckling

*Samantha N Golter, Benjamin R Ingling*

Students’ Department: Aerospace Engineering

Faculty Mentor: TerMaath, Stephanie Carmella

The overall objective of the NASA University Leadership Initiative project is to demonstrate a viable aerodynamic wing-design concept enabling a 70% reduction in fuel and energy usage. One of the main considerations is weight reduction, primarily in the wing boxes and the upper and lower skins of the wings. The initial stage of design, which this presentation focuses on, will be to optimize the weight and specifically the thickness of the skin panels for a variety of aviation quality metals. The metals being analyzed include the Aluminum alloys 2024-T4, 6061-T6, 7075-T6, and 7050 as well as a Titanium composite Ti-6Al-4V. To accomplish this, code will be created and executed in MATLAB and Dakota based on thin plate buckling equations. The results of the two programs will be compared to known solutions in order to ensure the accuracy of the findings. Understanding the properties of these metals at critical buckling loads will allow for proper material selection based on strength properties and overall optimized weight.

Poster # 586

Synthesis and characterizations of graphitic coated Aluminum nanoparticles produced as energetic materials via laser ablation in organic solutions.

*Camille Elizabeth Bergin*

Student’s Department: Aerospace Engineering

Faculty Mentor: Mukherjee, Dibyendu

Camille Bergin, Seyyed Ali Davari and Dibyendu Mukherjee

Department of Mechanical, Aerospace & Biomedical Engineering; Nano-BioMaterials Laboratory for Energy, Energetics & Environment (nbml-E3); University of Tennessee, Knoxville.

This poster presents a research initiative in collaboration with the US Army Research Lab (ARL) to synthesize carbon-coated aluminum (Al) nanoparticles (NPs) as energetic materials via laser ablation in organic solutions. Nanomaterials have gained widespread attention recently from an array of scientists and engineers for their desired physical and
chemical properties believed to be a product of their high ratio of surface area to volume, thus making them favorable for a wide variety of applications. Specifically, here Al NPs are favored for their energetic characteristics and usually employed as solid-state propellants. However, it is challenging and unsafe to preserve pristine Al NPs without any unwanted surface oxidation in ambient conditions, which in turn passivates and also retards their energetic activities. Therefore, a facile technique is proposed to synthesize Al NPs encapsulated in graphitic shells to prevent the unwanted surface oxidation. This research focuses on the laser ablation synthesis in solution (LASiS) method to synthesize the aforementioned graphitic-Al shell-core NPs. In recent years, LASiS has proven to be a green, facile, and inexpensive way to synthesize various nanomaterials with engineered interfacial properties for energetic and catalytic applications. The size distribution and composition of the nanoparticles can be manipulated by controlling the laser wavelength, laser flux, ablation time, solvent in which the metal target was immersed, and the laser beam’s focus. Finally, laser-assisted shock wave velocity measurements from the US ARL team confirmed that the carbon-coated Al NPs exhibit excellent exothermic and propulsive behaviors. We hypothesize that this is due to the tailoring of the particle sizes and the carbon shells, which in the future can be more specifically designed as fullerene-type shells to fine-tune the interfacial stresses, pressure, and consequently, the reactivity of these shell-core NPs.

Poster # 587

Identifying Methanotrophic Candidates for Trichloroethylene Remediation in Fracking Flowback

Eriko Mito Gordon

Student’s Department: Microbiology

Faculty Mentor: Hazen, Terry C

The Safe Drinking Water Act (SDWA) excludes hydraulic fracturing related activities from regulations that govern underground injections.1 This deregulation has led to the adoption of poor flowback management protocols in which inadequate treatment and disposal contribute to elevated levels of hazardous compounds in downstream water systems. Elevations of halogenated volatile organic compounds (VOC) have been demonstrated in downstream water systems that are used recreationally and feed into drinking water sources.2 This downstream elevation is a major health hazard.

There may be a biological solution in the methane monooxygenase enzyme (MMO) which allows for the co-metabolism of chlorinated VOC’s. Methanotrophic candidates will be found by serially diluting fracking flowback fluid on NMS liquid media with methane headspace. The most suitable strain will be introduced into a simulated water system contaminated with trichloroethylene in which MMO efficacy under differing conditions would be assessed with GC-MS measurements. Furthermore, a genetic identification of the co-metabolic pathway for trichloroethylene degradation will be conducted.


Poster # 588

A Window through Time: Simulation of Meteorite Microstructural Evolution

Caitlin Amanda Harpell

Student’s Department: Materials Science & Engineer

Faculty Mentor: Keffer, David J

Stars such as our Sun variably supply energetic particles throughout the solar system. Whereas the low energy, 1-2 keV, protons associated with the solar wind can have limited radiation effects, high energy/protons from Young Stellar Objects
(YSOs) emitted during early solar system evolution could result in chemical, nuclear, and morphological changes in early solar system solids. Insight into the nature of the early solar system can be gained through the residual structure of meteorites. Thus, this work studies the effects of energetic particle irradiation in early solar material by observing the effects of an ion beam on a primary meteorite mineral, forsterite, Mg2SiO4. Experimental ion bombardment can simulate this process to a limited extent. The purpose of this research is to complement experimental studies with a computational model, that describes energy transport and phase transformation in irradiated forsterite. We first validate the model by reproducing laboratory results. We then simulate early solar system conditions and compare the results with available meteorites. By changing the simulation parameters, we are able to account for effects in models of solar system evolution, such as the assumption of uniform or depth-dependent energy deposition.

Poster # 589

Ceramic to Metal: A Functionally Graded Material

Jared William Floyd

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Faculty Mentor: Rawn, Claudia J

Functionally graded materials (FGM) have been the topic of research since the late 1980’s, both in design and processing. Over the dimensions of the FGM there is a gradual variation in composition, microstructure, and physical, thermal, electrical, and mechanical properties. Targeted and tailored during the design process for improvement of specified properties the FGM can be optimized. The research here focuses on various ways to create a FGM where one side is a metal and the other side is a ceramic processed by hot uniaxial pressing, which combines high pressure with high temperatures. The ceramic side is a calcium aluminate (Ca12Al14O33) with titanium chosen for the metal side due to its high melting temperature (1941 K) and ability to reduce Ca12Al14O33. When reducing Ca12Al14O33 to Ca12Al14O32 the occluded O in the center of the host lattice cage of the atomic structure is removed and can be replace with electrons resulting in a conductive oxide. The resulting FMG showed that the ceramic side changed from highly electrically resistive to conductive. However, the mechanical integrity suffered due to surface and interior cracks.

Poster # 590

Effect of Laser Power on Defect Characteristics in Selective Laser Melt Additively Manufactured Stainless Steel

Elijah Cook Darby

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Recent improvements in the field of metal additive manufacturing have made possible the large scale production of various engineering components for a multitude of applications. However, critical advances in load-bearing structural applications require an improved fundamental understanding of the processing conditions and how they affect basic characteristics such as component dimensions and defect density. In this study, 316L stainless steel was additively
manufactured with a powder bed platform using selective laser melting as a function of the laser power. The AM samples were characterized using synchrotron x-ray computed microtomography at beamline 2-BM at the Advanced Photon Source. The tomography data were analyzed using Fiji and Scan IP software for crack and pore distribution. Moreover, the as-printed specimen dimensions were also measured. Finally, the correlation between the laser power, sample dimensions, and defect characteristics are investigated.

Poster # 591

Effects of Design Parameters on Fluid Flow in Ventricular Catheters

Allison M Campbell

Student’s Department: Materials Science & Engineer Faculty Mentor: TerMaath, Stephanie Carmella

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Cerebral shunts are commonly used as a standard treatment for patients suffering from life-threatening intracranial pressure (ICP) disorders, particularly congenital hydrocephalus, which is present in roughly 1 per every 1000 newborns [1]. While a cerebral shunt often leads to symptoms of relief and prevents immediate brain damage and death, the failure rate is around 40% within the first two years of initial placement and continued risk thereafter. These failures result in continuous neurosurgeries throughout a patient’s lifetime due to various complications, including the most prevalent, obstruction of the proximal catheter that diverts cerebrospinal fluid (CSF) from the ventricles to the shunt valve [2]. Understanding the dependence of CSF flow on the structure of obstructed catheters is critical to optimize ventricular catheter design. In this work, we present our effort to investigate the influence of different design parameters (catheter depth, inlet hole size, and insertion position) on CSF flow in ventricular catheters. A ventricle that mimics the human ventricle system is first modeled via additive manufacturing. The obtained ventricle is filled with water to represent CSF as the relevant properties of water are similar to those of CSF. A catheter is then placed into the ventricle and the flow rate of water that passes through the catheter is measured. By recording the water flow rate at various depth, inlet hole size, and insertion position of the catheter, we could establish the correlation between the catheter structure and fluid flow rate. This correlation provides the guideline to discover the optimal design parameters of the catheter with desired flow rate.

Poster # 592

Fabrication of dense UO3 pellets for neutron detection applications

Jessica Marie Ossyra, Aaron Crigger

Students’ Department: Chemical Engineering Faculty Mentor: Meek, Thomas T

High-efficiency detection of neutrons is fundamental to societal safety and the advancement of a variety of fields including nuclear medicine, high-energy physics, nuclear energy, structural biology and radiochemistry. Helium-3 and boron trifluoride currently provide the vital capability of direct conversion neutron detection, but each present difficulties due to cost, rarity, and toxicity. While previous research on uranium oxides has focused on their use as nuclear fuels, recent research has shown these uranium compounds exhibit semi-conducting characteristics with a broad range of electrical
properties. These properties make them potential candidates for use as direct conversion neutron detectors. In this study, a procedure for fabrication of uranyl oxide pellets was determined and verified through preliminary characterizations.

**Poster # 594**

**Influence of Volumetric Energy Density on Defect Formation in 3-D Printed Hastelloy X**

*Austin Quang Tri Ngo*

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In Additive Manufacturing (AM) of metallic structural alloy components, laser printing parameters influence the formation of cracks, pores, and lack-of-fusion defects which determine the mechanical properties of the material. For this study, five specimens of Ni-based alloy Hastelloy X were printed using SLM, with varying parameters to control laser volumetric heat input (VHI) in the range 146—58 J/mm³. These specimens were studied using synchrotron x-ray computed micro-tomography for internal defect imaging. Qualitatively, tomography data shows that a decrease in VHI causes an increase in porosity, in both pore size and the number of pores, and lack-of-fusion defects. Higher VHI reduces porosity but also causes hot cracking in Hastelloy X. The relationship between AM processing conditions and defect structures will be determined to understand how mechanical integrity can be determined from printing parameters.

**Poster # 595**

**Laser Brazing of Nickel Superalloys with a Ni-Mn-Fe-Co-Cu High Entropy Alloy Nanopaste**

*Samantha Christine Lang, Denzel Aaron Bridges*

Students’ Department: Materials Science & Engineer     Faculty Mentor: Hu, Anming

In this study, laser brazing was conducted with a nickel superalloy and Ni-Mn-Fe-Co-Cu high entropy alloy (HEA) nanopaste of molar ratio 1:1:1:0.25:1.75 to observe changes in mechanical performance, diffusion behavior, and microstructure evolution. HEA nanoparticles were formed by a top-down synthesis approach and condensed into paste. Shear strength testing of joints formed by brazing revealed the nanopaste gave similar mechanical properties to joints brazed with a bulk sample of the HEA, but with a lower temperature threshold. The nanopaste and bulk metal achieve maximum bonding strength near the liquidus temperature of the HEA. Far above this temperature, the strength suffers due to excessive diffusion of the filler and base metals. [1] Cr in the nanopaste was observed to migrate toward the base metal ahead of other constituents during diffusion, suggesting a phase change of the HEA contributes to the bonding strength.

Poster # 596

Optimizing Europium Concentration in Cs4SrI6 and Cs4CaI6 Scintillators

Daniel Joseph Rutstrom

Student’s Department: Materials Science & Engineer  Faculty Mentor: Zhuravleva, Mariya

One of the main driving forces behind interest in searching for new inorganic scintillators is the need for improved nuclear detection capabilities in homeland security applications. These scintillators must be easy to fabricate and producible in large quantities, while maintaining high light yield and good energy resolution. Cs4SrI6:Eu and Cs4CaI6:Eu scintillators were recently discovered and meet some of these criteria. Given that they are currently in the early stages of development, it is necessary to evaluate effects of Eu2+ concentration on scintillation properties. In this work, single crystals of Cs4SrI6:Eu and Cs4CaI6:Eu with 0.5 mol%, 1 mol%, 3 mol%, and 7 mol% were grown from the melt via the vertical Bridgman method. Scintillation performance was evaluated to determine the optimal amount of Eu2+. The observed trend was that energy resolution and light yield both improved with increasing Eu2+ concentration. The best results were a 3.4% resolution with 65,000 ph/MeV light yield for Cs4SrI6:Eu 7% and a 4.2% resolution with 55,000 ph/MeV light yield for Cs4CaI6:Eu 7%. Evaluation of 9 mol% Eu2+ concentration is currently in progress. Additionally, Yb2+ and Ce3+ are each being investigated as new activators for Cs4SrI6 and Cs4CaI6 due to their potentially faster decay times.

Poster # 598

Synthesis and Phase Identification of Lithium Gallium Oxide Compositions for Scintillator Applications

Katherine L Gordon, Camera Janelle Foster

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Creating and examining sintered pellets is a cost- and time-efficient alternative to growing single crystals for analysis. In this study, pellets of three different lithium gallium oxide compounds were doped with cerium and sintered. The purpose of making these pellets is to investigate compositions of lithium gallium oxide for scintillator applications. Scintillators are fluorescent materials used for various applications in high energy radiation detection. Compositions of LiGaO2:Ce, Li5GaO4:Ce, and LiGa5O8:Ce were created from combining Li2CO3, Ga2O3 and CeO2 at different ratios. These ratios were found stoichiometrically assuming the CO2 produced would burn off, and aiming to use 5% cerium by weight. The pellets were doped with cerium to activate scintillation. These mixtures were made into pellets using a SPEX mixer mill for 10 minutes and a Carver pellet press at 750 psi, and sintered using a Carbolite Gero box furnace in air. The sintering temperatures of LiGaO2 and LiGa5O8 used were based on the principle of being 2/3 the melting temperatures. The sintering temperatures used for LiGaO2 and LiGa5O8 were 1100°C and 987°C, respectively. The sintering of Li5GaO4 was investigated at 1100°C, 800°C, and 500°C. The only temperature tested that did not melt the Li5GaO4 pellets was 500°C. In future research, the phase of the pellets will be determined with the use of x-ray diffraction and analysis using a Panalytical Empyrean and PDF-4+ database.
Poster # 599

Automating an ORIGAMI-MCNP Workflow for Analyzing Spent Nuclear Fuel via X-Ray Fluorescence

Jonathan Trent Mitchell

Student’s Department: Nuclear Engineering
Faculty Mentor: Skutnik, Steven Eugene

ORIGAMI has tools through which it can more seamlessly integrate with MCNP, primarily through its ability to generate spent nuclear Fuel (SNF) isotopic assays in a format directly compatible with MCNP. While this simplifies the process of performing MCNP simulations involving SNF, when such simulations are completed using SNF of different assays, a more streamline process for integrating the two codebases can reduce development time and user error. For this purpose, modular Python scripts have been developed to quickly generate ORIGAMI files for calculating SNF assays for a user-customizable range of fuel burnups, enrichments, assembly types, and cooldown times. From these input files, ORIGAMI can then generate SNF assays as MCNP materials cards. Another Python script then iterates over each MCNP data card and integrates it into an HKED (hybrid K-edge) MCNP model, which can then be executed automatically to generate HKED data for the SNF sample, including an x-ray fluorescence (XRF) spectrum. Utilizing the model, successful analysis has been performed on a set of sample data to determine the ratio of the K-α and K-β peaks for Uranium and Plutonium. Utilizing these automated Python tools, this analysis can be quickly performed for many SNF assays, and the trend between the ratio of Uranium to Plutonium in the sample can be correlated to these peak ratios as seen in the XRF spectrum.

Poster # 601

Investigating Isotopic Concentration Variability in Used Nuclear Fuel

Amanda Marie Bachmann

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Faculty Mentor: Coble, Jamie Baalis

Electrochemical reprocessing of used nuclear fuel helps to provide a sustainable advanced fuel cycle. However, it comes with nonproliferation concerns as the actinides, such as Uranium and Plutonium, are separated out of the rest of the material in the fuel. This project aims to create usable data of isotopic and elemental concentrations to use for comparison in the Separations and Safeguards Performance Model produced by Sandia National Labs [1]. The data compiled is generated data from the ORIGAMI module of SCALE, and it designed to represent used nuclear fuel after normal operations of a reactor. The characteristics examined include fuel assembly, burnup, enrichment, and cooling time. The fuel assemblies examined only a Westinghouse 17x17 fuel assembly for a Pressurized Water Reactor (PWR), but will be expanded to include other PWR models, as well as other reactor types. The burnup values examined ranged from 20 GWd/MTU to 70 GWd/MTU, increasing in increments of 5 GWd/MTU. The enrichment values examined were calculated based on the following formula from LANL [2]:

\[
\text{Enrichment} = 0.31 \times \text{Burnup}^{0.65}
\]

From the calculated values, ± 5% and ± 10% were included. The discharge times examined were 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 15, 20, 25, 30, 40, and 50 years.

The data was compiled according to a hierarchy of the fuel assembly, burnup, and enrichment, followed by the cooling time, followed by if it was isotopic concentrations or elemental concentrations. This database is incorporated into the model provided by Sandia National Labs, expanding the capabilities of the model and the fuel it is able to examine.
References:


Poster # 603

Molten Salt Reactors: Instrumentation and Control

William Andrew Naylor

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Faculty Mentor: Upadhyaya, Belle R

Molten salt reactors (MSRs) are a class of nuclear reactor which contain fissile material in a salt solution. This is in contrast to existing nuclear power reactors which contain fissile material in a solid form. There are many safety advantages to MSRs, chiefly, the inability of the fuel to melt down. Additionally, most MSR designs feature a freeze plug that allows the core to drain in the event of a loss of electrical power. Passive safety features like this offer the opportunity for less stringent regulatory requirements—this in turn leads to more economical reactors.

To date there has only been one MSR to be built and operated for a significant amount of time, the molten reactor research experiment (MSRE) conducted at Oak Ridge National Laboratory. This experiment was documented extensively and serves as the basis for most current MSR research.

As the push for MSR development continues economic feasibility becomes ever more important. This research is focused on implementing modern instrumentation and control techniques to further enhance the economic feasibility of larger scale MSRs. Since the time of the MSRE many advancements have been made in on line monitoring including high temperature measurements, ex-vessel neutron monitoring, and on line salt concentration measurements.

Poster # 604

Structural stability of REE-PO4 (REE=Sm,Tb) under high pressure and ion irradiation

Jacob Edward Cooper

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Rare earth element (REE) phosphates (REE-PO4) have attracted much attention in recent years. Due to their unique crystal structures, these compounds are being investigated as a possible host material for long-term, high-level radioactive waste storage. REE phosphates form two main structures, monazite and xenotime, both of which are being studied for nuclear applications. To test the structural durability of these two different crystal phases under extreme
conditions, we have performed two experimental investigations on SmPO₄, which contains the monazite structure, and TbPO₄, which contains the Xenotime structure: (i) irradiation with swift heavy ions (1.1 GeV Au ions) and (ii) compression to very high pressures (SmPO₄ up to 41 GPa and TbPO₄ up to 21 GPa) using diamond anvil cells (DACs). Synchrotron X-ray diffraction (XRD) and Raman spectroscopy were used to study structural modifications in situ (i.e., during pressurization) and ex situ (i.e., after pressurization or irradiation). Under high pressure, SmPO₄ shows no evidence of phase transformations, while TbPO₄ transformed to the monazite structure. In contrast, the behavior under irradiation is similar between both compositions with ion beam-induced amorphization starting at a similar fluence.

Poster # 606
Synthesis and Structural Analysis of Zirconate Pyrochlore Oxides

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Due to their structural and chemical stability under high energy irradiation, pyrochlore oxides have recently been studied for their potential use as nuclear waste mediums or inert fuel matrices. In order to better understand how these oxides maintain their structural and chemical integrity, the analytical techniques of X-ray diffraction and neutron total scattering have been utilized to study their nanostructure and atomic spacing. Although both techniques are used to reveal detailed structural information about the polycrystalline materials, a recent study has shown that the traditional model of a disordered, defective fluorite structure is not quite the correct model. X-ray diffraction experiments on pyrochlores seem to agree with the pyrochlore to fluorite model, but neutron total scattering experiments show that these pyrochlores do not match with this model.

This presentation compares neutron total scattering results made at the Nanoscale Ordered Materials Diffractometer (NOMAD) at ORNL to X-ray diffraction results of 6 different pyrochlore oxides with the A₂Zr₂O₇ stoichiometry (A=Nd, Lu, Yb, Er, Ho, Y). A possible explanation of why the two analytical techniques yield differing results is also discussed. The X-rays used in X-ray diffraction interact only with the electrons in a material and are not as adept at characterizing lighter atoms such as the oxygen present in the pyrochlores (~64 atom%). Neutrons, on the other hand, interact with atomic nuclei and yield a more complete depiction of the pyrochlore structure.

References

Poster # 607
X-Means Clustering Implementing the Gap Statistic for Multiple Positron Emission Particle Tracking

Matthew T Herald

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Faculty Mentor: Ruggles, Arthur E
Abstract: The most efficient and accurate method for clustering Coincidence Lines (CL) for Positron Emission Particle Tracking (PEPT) is undetermined. A number of methods have been created to perform this task. A novel clustering method featuring x-means is presented using an automated k-value estimator for k-means clustering. Gap statistic is used to select the best k-value. Geant4 Application for Tomographic Emission is used to simulate particles of 50 µCi and the detection and electronic chain associated with the Siemens Inveon Pre-Clinical Scanner. The simulation produces an array of coincident lines (CL) in format consistent with scanner output. The CL are used to reconstruct particle positions every 100 ms. The position reconstruction is compared to earlier methods.

Poster # 608

Synchrotron X-ray Computed Microtomography Study on the Relationship Between Processing Parameters and Defect Characteristics in a Selective Laser Melt 3-D Printed Alloy

Kacey Yukai Tomsovic

Student’s Department: Materials Science & Engineer Faculty Mentor: Choo, Hahn

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The fundamental understanding of the effects of processing parameters on various 3D printed defect characteristics is critical to the development of structural or functional metal 3D printing. A systematic study of constant power of 380 W and varying laser scan speeds from 100 to 1200 mm/s using 316L low carbon stainless steel alloy was conducted. From this data, an ideal combination of scan speed and 380 W was demonstrated to optimize microstructural defect characteristics. Defect characteristics studied include defect density and distribution, aspect ratio, and orientation with respect to the Z printing direction. Initial data was acquired at the Advanced Photon Source (APS) at Argonne National Lab using synchrotron x-ray computed microtomography at beam line 2IBM. Acquired initial data had to be reconstructed to usable images via TomoPy, an open source software created at APS 2IBM. Using Fiji and Simpleware Scan IP software, processing parameters were qualitatively and quantitatively correlated to defect characteristics in order to demonstrate an optimal range of scan speed at constant wattage.

College of Agricultural Science and Natural Resources

Poster # 609

Determining and modeling the residence time distribution of biomass particles in a bench-scale bubbling fluidized bed reactor

Benjamin Cruz

Student’s Department: Biosystems Engineering Faculty Mentor: Abdoulmoumine, Nour

Benjamin Cruz1, Oluwafemi Oyedeji1, Emilio Ramirez2, Charles Stuart Daw1,2 and Nourredine Abdoulmoumine1,4
Fluidized bed reactors are frequently used during biomass fast pyrolysis to produce primarily a dark organic liquid known as bio-oil or biocrude. In the process, the raw biomass is converted to a solid residue, biochar, and non-condensable gases. While the gas residence time of vapors during biomass fast pyrolysis is well investigated, the residence time distribution of solids are seldom studied. Yet, knowledge of the residence time of different biomass particles under various operating conditions is essential to accurately model the pyrolysis kinetic process and the heat-transfer characteristics of the system.

In this study, we propose to investigate the residence time distribution (RTD) in a bench-scale bubbling fluidized bed reactor using pine biochar at different devolatilization stages during fast pyrolysis. The flow of solid biochar materials will be monitored using an acoustic sensor and the resulting signal will be processed to derive RTD curves. RTD curves will be further analyzed to determine the effect that experimental parameters have on the non-ideal biochar flow patterns within the fluid bed.

Poster # 610

Devolatilization kinetics of high ash containing switchgrass by differential thermogravimetry (DTG) – Elucidating the impact on ash constituents on the kinetic parameters

Miles Christopher Ownby

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Faculty Mentor: Abdoulmoumine, Nour

Marginal, high ash containing lignocellulosic biomass are potential low cost feedstocks for thermochemical conversion via fast pyrolysis. While the kinetics of devolatilization for low ash containing whole biomass feedstocks have been well studied, that of high ash containing biomass is poorly understood despite the well-established connections between ash content and composition and pyrolysis product yields and quality. This study investigates the effect of global ash and individual inorganic elements on the devolatilization kinetics of switchgrass before and after serial pretreatment with 2,6-pyridine dicarboxylic acid (PDA) to selectively remove inorganics.

The devolatilization behavior and kinetics of high ash containing switchgrass were evaluated using differential thermogravimetry (DTG) under various heating rates (25, 50, 75, 100, 125 °C/min) from room temperature up to 650 °C. The DTG curves were deconvoluted into the three principal DTG curves representative of structural polymers (i.e. hemicellulose, cellulose and lignin) using lognormal distribution functions. The global reaction kinetics were modeled by three independent parallel reactions, describing the degradation of the aforementioned polymers using the Avrami-Erofeev and the power rate law models. The reactivity of the different biomass type varied by primary polymer (cellulose vs. lignin), total ash content as well as individual inorganic elements. The activation energies ranged from 175 to 184 kJ/mol while the reaction orders ranged from 1.49 for hemicellulose and cellulose and lignin and 1.38 for lignin. Statistical analysis was performed to discriminate between rate laws and inorganic constituents.
Poster # 611

Importance of Force and Angles during the Design of the EZ-Lift

Emily Lauren Rice

Student’s Department: Environmental/Soil Sciences  Faculty Mentor: Ayers, Paul D

The redesign of the Roll Over Protective System (R.O.P.S.), now known as the EZ-Lift, was restructured by the University of Tennessee R.O.P.S Team. The goal behind this was to make the original R.O.P.S. on lawn mowers more manageable to fold down and bring back up. This innovation allows the original two post model to now pivot on a hinge, making it easier for the R.O.P.S. to go under low branches or brush with little inconvenience to the user.

When creating the R.O.P.S, force and angle measurement play a large part in the design. One part specifically would be the stopper, the stopper sits below the pivot point allowing the R.O.P.S. to fold back no further than a certain angle, which varies depending on the weight and force the R.O.P.S implements. This design allows the operator to lift the R.O.P.S. into the upright position without being too strenuous on the user. Although each R.O.P.S. will vary in size due to the size and weight of the mower, the goal is to have a universal design one for the larger R.O.P.S. and one for the smaller versions.

Poster # 612

Sorghum Starch Ultrasonication Project

Zhihong Wang

Student’s Department: Food Science  Faculty Mentor: Dia, Vermont Punongba

Sorghum, a highly nutritious grain, is usually not considered as a main staple in many families because it is not as easy to be digested as other grains such as rice or maize. But recent studies of ultrasonication shed a light on potential utilization of this world’s fifth important cereal other than being raw material source of biofuel or liquor. This experiment was meant to compare the differences between unsonicated and sonicated sorghum starch in terms of their physical chemical properties and digestion ability. Despite their similarities in shapes under microscopes and their thermal properties, but sonicated sorghum starch was higher than unsonicated sorghum in the results of water retention capacity, swelling power, solubility and especially digestibility. The results might provide the background for further research to broaden the practical usage of sonicated sorghum in foods.

Poster # 613

Oral Tactile Sensitivity and Processing

Zoe Nicole Resmondo

Student’s Department: Food Science  Faculty Mentor: Luckett, Curtis Robert

Texture perception is one of the most important factors in food acceptance, yet population-wide differences in texture sensations are not well understood. The variation in texture perception across populations is thought to depend on oral tactile sensitivity and oral processing behaviors. To address this hypothesis, we aimed to measure tactile acuity and quantify the relationship to chewing efficiency. The study was performed on 100 subjects, in 3 age groups (20-25, 35-45, or over 65). Two main measures of oral tactile sensitivity were performed. To assess sensitivity to pressure, subjects were asked to discriminate between foam samples of varying hardness. Secondly, to assess lingual sensitivity the subjects were asked to identify 3D printed shapes, ranging from 3mm to 8mm, using their tongue. Additionally, chewing efficiency
was measured through assessing each participants ability to mix specially prepared chewing gum. In general, we found that oral sensitivity and mastication ability in the younger age groups was superior to those over 65 years old. We also found a significant positive correlation between pressure sensitivity and chewing efficiency. These results help bolster evidence that oral tactile sensitivity and oral processing are related, as well previously reported declines in both as people reached older age.

Poster # 614

Characterization and frictional response of biomass based on principles from soil mechanics

Emma Mcdonald Beach

Student’s Department: Biosystems Engineering Faculty Mentor: Drumm, Eric C

There has been substantial research conducted on the chemical conversion of lignocellulosic biomass to high value products, but the efficiency of these conversion processes has been limited due to problems with feedstock conveyance and handling. Our focus in this study is to address this problem by applying principles from the mechanics of coarse-grained soils to investigate the frictional response of several biomass feedstocks. Three biomass materials were investigated: pine, pine bark and switchgrass processed through a hammer mill and knife mill. These materials were characterized by sieve analysis tests and bulk density measurements, and compared with a uniform “play sand” obtained from a big box store. The angle of repose, which is an approximation to the angle of internal friction when the density of the material is low, was determined for all four materials. The interface friction angle, which defines the friction mobilized between a granular material and a rigid surface such as the side of a storage hopper, was determined for each material with respect to both carbon and stainless steels. The interface friction ratio, defined as the interface friction angle normalized by the angle of repose, was fairly consistent for all three biomass materials, ranging from 0.53 to 0.67. The ratio was determined to be slightly lower for stainless steel than carbon steel for all three biomass feedstocks, suggesting that stainless steel may offer some advantages in hopper performance. Interestingly, the friction ratio for the sand was greater with stainless steel.

Poster # 615

Tropical soil health and agricultural land use change

Sarah Louise Ottinger

Student’s Department: Environmental Soil Science Faculty Mentor: Stier, John

One of the greatest challenges for agriculture in the tropics is land degradation. In the developing country of Belize, these challenges manifest themselves in forms of deforestation, water quality reduction, and decreased soil health; the frontline of agriculture and conservation converge in Belize’s Vaca Forest Reserve. The Vaca Forest Reserve is an area of tropical biodiversity and a critical buffer to adjacent communities such as the Chiquibul National Park, Mountain Pine Ridge Forest Reserve, and Guatemala. Land use change has occurred in this region over a 30-year period as primary and secondary forest is converted to agricultural land. My research aims to compare the soil physical, nutrient, and carbon properties among farms and forest land. We hypothesized that these indicators of soil health would be impacted by agricultural disturbance of varying intensity, and preliminary results indicate that agriculture in this region has significantly altered the soil system. It will be critical to identify cropping practices that cause this decrease in soil health. This research is expected to provide comprehensive understanding of the local soil system to aid in management decisions that impact multiple Belizean stakeholders.
**Poster # 616**

**Soil moisture and soil temperature variability among three plant communities in a High Arctic Lake Basin**

*Megan Lee Davis*

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Soil moisture and soil temperature are critical to plant community distribution and soil carbon cycle processes in High Arctic tundra. As environmental drivers of soil biochemical processes, the predictability of soil moisture and soil temperature by vegetation zone in High Arctic landscapes has significant implications for the use of satellite imagery and vegetation distribution maps to estimate of soil gas flux rates. During the 2017 growing season, we monitored soil moisture and soil temperature weekly at 48 sites in dry tundra, moist tundra, and wet grassland vegetation zones in a High Arctic lake basin. Soil temperature in all three communities reflected fluctuations in air temperature throughout the season. Mean soil temperature was highest in the dry tundra community at 10.5±0.6ºC, however, did not differ between moist tundra and wet grassland communities (2.7±0.6 and 3.1±0.5ºC, respectively). Mean volumetric soil moisture differed significantly among all three plant communities with the lowest and highest soil moisture measured in the dry tundra and wet grassland (30±1.2 and 65±2.7%), respectively. For all three communities, soil moisture was highest during the early season snow melt. Soil moisture in wet grassland remained high with no significant change throughout the season, while significant drying occurred in dry tundra. The most significant change in soil moisture was measured in moist tundra, ranging from 61 to 35%. Our results show different gradients in soil moisture variability within each plant community where: 1) soil moisture was lowest in dry tundra with little change, 2) highest in wet grassland with negligible change, and 3) variable in moist tundra which slowly dried but remained moist. Consistently high soil moisture in wet grassland restricts this plant community to areas with no significant drying during summer. The moist tundra occupies the intermediary areas between wet grassland and dry tundra and experiences the widest range of soil moisture variability. As climate projections predict wetter summers in the High Arctic, expansion of areas with seasonally inundated soils and increased soil moisture variability could result in an expansion of wet grassland and moist tundra communities with a commensurate decrease in dry tundra area.

**Poster # 617**

**Agroforestry Alternatives in Belize: Evaluating the Potential of Teak**

*Andrew Thomas Franks*

Student’s Department: Forestry  
Faculty Mentor: Hodges, Donald G

Many rural families in Belize rely on small-scale agriculture as their primary source of income. Near the country’s western border, Belize is establishing a community management program in the Vaca Forest Reserve. The Belize Forest Department is working with Friends for Conservation and Development to organize and educate local farmers on sustainable land management. Currently, farmers in the area heavily rely on slash and burn techniques to clear vast amounts of forest for grazing and row crops that have saturated the market. However, teak may act as a short-term, high-value timber crop in the area, providing farmers with an opportunity for additional income. Teak (Tectona grandis) is a tropical hardwood species with high commercial value in other countries. To assess teak viability in the Vaca Forest Reserve, six plantations of various sizes were assessed. Each plantation’s management history and future harvest plans
were ascertained through interviews with the owners. Plots were established in each plantation, and spacing, diameter at breast height, and height were measured. With an average growth rate of 1.42 meters per year in height and 1.82 centimeters per year in diameter at breast height, teak may offer farmers an opportunity to utilize marginal lands to increase income.

Poster # 618

Potential Pathogens of Industrial Hemp (Cannabis sativa)

Angel Grace Chaffin

Student’s Department: Forestry  Faculty Mentor: Gwinn, Kimberly D

In hemp, cannbigerolic acid is primarily converted to cannabidoil (CBD); whereas, in marijuana (C. sativa or C. indica), it is converted to tetrahydrocannabinol (THC). Industrial hemp contains less than 0.03% THC. Hemp is a recent crop in Tennessee, and its diseases are not described. The purpose of this study was to identify pathogens of hemp in Tennessee. Since some pathogens are seed borne, seeds of two hemp cultivars, ‘Futura’ and ‘Fedora’, were treated using 10% sodium hypochlorite or deionized water, or were untreated. Seedlings were counted nine days after planting in greenhouse growing mix. Surface sterilization reduced germination, and development of symptoms was not related to treatment. Symptomatic leaves were collected from other greenhouse grown plants and placed in moist chambers. Fungi were cultured and identified as Chaetomium globosum based on colony characteristics, spore and perithecia morphology, and sequence of ITS region. Surface-sterilized seeds of both cultivars were germinated on water agar plates. Bacteria emerged from both germinated and non-germinated seed. Additional studies are needed to determine the impact of these

Poster # 619

Evaluating the susceptibility of Notophthalmus viridescens to Batrachochytrium salamandrivorans (Bsal)

Daniel Malagon

Student’s Department: College Scholars Program  Faculty Mentor: Gray, Matt

The fungal pathogen Batrachochytrium salamandrivorans (Bsal) is emerging in Europe and is pathogenic to several salamander species. Recent risk models indicate the southeastern United States is an area of high concern following Bsal introduction; however, these models ignore relative susceptibilities of native fauna and biotic interactions (e.g., contact rates) that drive the epidemiology of Bsal. Thus, our goal was to robustly estimate the susceptibility of eastern newts (Notophthalmus viridescens) to Bsal, and to determine contact rates between aquatic adults. Newts from six populations spanning the geographic range of N. viridescens were inoculated with Bsal zoospores in a dose-dependent design and monitored for signs of disease for ≥ 70 days.

Observed mortality was generally low (x̅ = 21%) and dose-dependent. Mortality differed among populations, with newts collected from Michigan experiencing the greatest mortality due to chytridiomycosis. For all populations, infection was maintained in a majority of individuals (x̅ = 80%) exposed to the pathogen, suggesting this species could be a reservoir and help maintain and translocate Bsal in the environment. To measure contact rates, wild-caught N. viridescens were placed in 1-m2 pools at densities of two, four, or eight newts either with or without plants. Contacts were video recorded for four hours per day, one hour in each diel period. In general, contacts increased exponentially as density increased, but did not differ among diel periods. With the addition
of plants, contacts were significantly reduced at higher newt densities. These results indicate that *N. viridescens* could play a major role in the emergence of Bsal in North America, and that increasing structural complexity of their aquatic habitats could reduce Bsal transmission and help control outbreaks.

**Poster # 620**

**Confirmation of Odorous House Ant Clades in Knoxville, Tennessee Using a Novel and Cost-Efficient Assay**

*Geordan Wyatt Hall*

Student’s Department: Ecology/Evolutionary Biology  
Faculty Mentor: Vail, Karen M

The native, invasive *Tapinoma sessile* (Say), commonly known as the odorous house ant (OHA), is found throughout the US in diverse habitats. Recent research suggests this species may consist of four closely related mitochondrial clades, two of which were reported from Tennessee. Determining if different clades are present in an area is important because management strategy outcomes may be clade specific. This project will determine the OHA clades present in Knoxville, TN as well as test a new method to identify these clades that is cost efficient. Ants were collected locally and sent by contributors from regions with suspected north and south clades. OHA were visually confirmed, then to identify the mitochondrial clades DNA was extracted, COI gene was amplified with PCR, and select samples were sequenced to identify clades. To improve efficiency, we identified a restriction enzyme that only cut the north clade (~300/400bp) and left the south intact (~750bp). We confirmed clade identity and restriction enzyme assay success. The north and south clades were identified using both methods. Knowing clade identity may improve management strategies specific to each clade. Future research will verify multiple Knoxville OHA clades and restriction enzyme assay efficiency using widely dispersed samples collected later this year.

**Poster # 621**

**The enzymatic and geochemical properties of bone**

*Emily Abigail Grimes*

Student’s Department: Biological Sciences  
Faculty Mentor: DeBruyn, Jennifer Mary

The study of bone taphonomy has important implications for paleontology and forensic science. Studies have shown that microbes inhabit bones and are presumably playing a role in their decay, however there have not been any studies detailing the functional activity of the microbes in bones and how they affect the composition of bone. The objective of this research is to determine the microbial collagenase enzymatic activity and bone chemistry in 30 skeletal elements from three North American beavers (*Castor canadensis*), which decomposed on the soil surface in a mixed deciduous forest. My hypothesis is that microbes are modifying bone chemistry and there will be a correlation between microbial enzyme activity and bone chemistry. To examine the variation in microbial enzyme activity, modified collagenase assays were used. For bone chemistry, Fourier-transform infrared (FTIR) spectroscopy was utilized to examine crystallinity, carbonate, phosphate, and organic content. The results indicate that certain areas of the skeleton (i.e., ribs) have more collagenase activity than other areas. There were no correlations between bone chemistry and microbial activity. However, there were some differences in bone chemistry between different skeletal areas. Ultimately, microbial activity may not be controlled by bone chemistry, and beaver skeletons exhibit some chemical variation.
Poster # 622

Antimicrobial Resistant Bacterial Isolates from Raw Bulk Tank Milk

Emily Marie Stone

Student’s Department: Animal Science
Faculty Mentor: Kerro Dego, Oudessa

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Abstract

Antimicrobials are used for treatment and prevention of diseases affecting humans and animals. In dairy farms antimicrobials are mainly used for the treatment of mastitis. Despite these benefits, antimicrobial resistance increasingly becomes a major concern both in human and veterinary medical services. Transmission of an antimicrobial resistant bacteria or resistance gene to humans could occur if contaminated unpasteurized milk and/or dairy products made from contaminated raw milk is consumed. The objective of this study was to evaluate the presence of antimicrobial resistant bacteria in raw milk samples. A total of 20 bulk tank raw milk samples were collected from 4 commercial dairy farms in Tennessee. Samples were evaluated for the presence of bacteria resistant to tetracycline (TTC), cephalosporins (CTX, CMY-2), erythromycin (ERY) and quinolones (nalidixic acid-Nal). We also extracted genomic DNA from resistant bacterium and evaluated presence of resistance gene by PCR. We found tetracycline, ceftriaxone and nalidixic acid resistant E. coli, Klebsiella pneumonia, Klebsiella oxytoca, and Pseudomonas aeruginosa from tested farms. Our result also showed that all resistant bacteria carry resistance gene. The consumption of nonpasteurized milk predispose consumers to infection that may not be treatable. Therefore, consumption of raw milk must be avoided by all costs.

Poster # 623

Enumerating and Differentiating Zoospore Types of Batrachochytrium salamandrivorans using Flow Cytometry

Ciara N Sheets

Student’s Department: Wildlife & Fisheries Science
Faculty Mentor: Miller, Deb

Ciara N. Sheets1, E. Davis Carter1, J. Patrick W. Cusaac1, Shigetoshi Eda1, Anastasia Towe1,2, Matthew J. Gray1, and Debra L. Miller1,2.
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Batrachochytrium salamandrivorans (Bsal) is a recently discovered fungal pathogen that is causing salamander declines in Europe. Bsal has two life forms: a motile, flagellated zoospore and a non-motile, highly adhesive encysted zoospore, which differ in their environmental persistence. Our goal was to optimize flow cytometry to differentiate between viable and dead zoospores as well as encysted and flagellated types. Understanding the shedding rate of viable zoospores for each life form is fundamental to modeling Bsal epidemiology and predicting likelihood of emergence and geographic spread. We optimized flow cytometry for Bsal enumeration then compared the variability in counts between this technology and traditional hemocytometer counts. Hemocytometer counts were more variable than flow cytometry counts for researchers with limited to moderate hemocytometer experience, but not for experienced researchers. We optimized flow cytometry to differentiate between viable and dead zoospores using propidium iodide staining and verified that the
viability of Bsal zoospores in vitro ranged from 85 – 97%. Lastly, we were able to differentiate between motile and encysted zoospores using flow cytometry by staining the latter life form with Calcofluor White, and verified these counts using fluorescent microscopy. Our results demonstrate that flow cytometry is effective at enumerating and differentiating Bsal zoospores.

Poster # 624
BG-4, a novel peptide from Momordica charantia, induces apoptosis in Ovarian Cancer Cells
Ashley Dalyn Bloom

Student’s Department: Food Science And Technology
Faculty Mentor: Dia, Vermont Punongba

Momordica charantia is a perennial plant with reported health benefits. Food-derived molecules, like the novel peptide BG-4 found in Momordica charantia, have been shown to have anticancer properties by promoting apoptosis in colon cancer cells. Ovarian cancer (OVCA) is the deadliest form of all gynecological cancers. The high fatality rate of OVCA is due to late presentation of the disease, cancer persistence, and recurrence in patients. The objective of this study was to determine the ability of BG-4 to cause cytotoxicity to ovarian cancer cells (A27801AP and COV318) and determine the mechanism involved by measuring proteins associated with apoptosis. BG-4 treatment caused a decrease in viable cell count by 65.1% at 250 μg/mL (A27801AP) and 19.8% at 250 μg/mL (COV318). The mechanism involved in the decrease in viable cell count is due to promoted apoptosis as evidenced by increased percentage of A27801AP undergoing apoptosis from 7.1% (untreated) to 23.9% (BG-4 treated, 250 μg/mL). The molecular mechanism explanation for the induced apoptosis of ovarian cancer cells due to BG-4 is caused by the increase in expression of pro-apoptotic marker BAX while reducing expression of anti-apoptotic marker XIAP. This led to an increase in expression of caspase-3 and caused an affect on the expression of cell cycle proteins p21 and CDK1. These findings support the hypothesis that there is anti-cancer potential for the BG-4 peptide isolated from Momordica charantia in vitro against ovarian cancer and should be further addressed using in vivo models of ovarian carcinogenesis.

Poster # 625
Selective, Sensitive, and Rapid Detection of Target Viral Nucleic Acids via Catalytic DNA Biosensor
Heena Patel

Student’s Department: Microbiology
Faculty Mentor: Eda, Shigetoshi

Pseudorabies also known as Aujeszky’s disease occurs via the infection of animals by pseudorabies virus (PRV). PRV branches from the family of Herpesviridae with double stranded DNA enveloped with icosahedral symmetry in a capsule. PRV has an extensive host range a few including: domestic animals (i.e. dogs, cats, pigs, cattle) and wild animals (i.e. raccoons, skunks, rabbits, possums). Thus, pseudorabies is proposed to be a model disease for this project. Prompt disease diagnosis and pathogen identification is imperative for treatment and disease prevention/control. Most diagnostic tests target a protein or nucleic acid biomarker as an indicator of viral presence. Many of the widely used diagnostic assays can be expensive and tedious thus creating a need for rapid and affordable diagnostic assays. Polymerase Chain Reaction is considered most reliable for pathogen detection via DNA biomarker however, catalytic DNA biosensors have gained interest as an alternative due to inexpensiveness, ease of use, and compatibility with a wide range of assays. Our lab has designed a distinctive catalytic DNA biosensor and demonstrated the biosensor’s ability to rapidly and selectively detect target viral genomic sequences. The specificity of the biosensor was presented using colorimetric, chemiluminescent, and electrochemical methods. For all methods, we were able to successfully detected target nucleic acid molecules in the nanomolar range within 16
minutes. The specificity and rapid detection achieved by our biosensor over various detection methods indicate our approach could be useful in the development of a rapid detection assay for pathogenic viruses.

Poster # 626
The Q-system: A New Technology To Regulate Coordinated Transgene Expression in Plants

Robert Graham Sears, Elgin Henry Akin

Students’ Department: Plant Sciences
Faculty Mentor: Stewart, Neal

Elgin Akin1*, Robert Sears1*, Wusheng Liu1, Reggie J. Milwood1, Yonghui Wu1, Yuanhua Shao1, Mitra Mazarei1, Christopher J. Potter2 and C. Neal Stewart, Jr1.

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This work examines the Q-system from the fungus Neurospora crassa for controlling gene expression in plants. The Q-system is an inducible binary system containing a transcription factor (QF) and the 16 bp transcription factor binding site for QF known as the QUAS motif. The Q-system has been implemented in Drosophila melanogaster and human HeLa cells, suggesting that this technology has relevant application outside of fungi. This study seeks to determine whether the number of QUAS motif repeats influences the expression of an orange fluorescent reporter protein in Nicotiana tabacum (tobacco). Transient expression experiments were performed in tobacco leaves by co-infiltrating Agrobacterium. Agrobacterium strains harbored plasmids that contained the QF transcription factor driven by the cauliflower mosaic virus (CaMV) 35S promoter, or plasmids containing variable repeats of the QUAS motif (1x, 2x, 5x, 10x, 15x) with a minimal CaMV 35S promoter driving OFP expression. We observed no difference in OFP expression with 1x and 2x QUAS repeats compared to a negative control, but there was a significant increase in OFP expression with 5x, 10x, and 15x QUAS repeats. Based on these results, the Q-system could be a valuable tool for the regulation of gene expression in plants regardless of promoter choice.

Poster # 627
The use of potato (Solanum tuberosum) suspension cells for rapid screening of chloroplast transformation vectors

Lindsey Hale Shover

Student’s Department: Plant Sciences
Faculty Mentor: Stewart, Neal

Chloroplast genetic engineering is unique in that it allows for high levels of gene expression while providing a means of natural bio-confinement. Although the chloroplast genome sequence of over 800 plant species is known, the elements that naturally regulate chloroplast gene expression are poorly understood. Recently, our lab has developed a 264 part modular cloning kit that contains known chloroplast regulatory elements. This kit can be used for the construction of novel chloroplast transformation cassettes; however, functional testing of these cassettes is currently hindered by standard chloroplast transformation technologies. Therefore, the aim of this experiment was to develop a rapid cell-based screening method that can be used for analyzing chloroplast transformation vectors. Golden Gate cloning was used to assemble a cassette from our kit that contained the native chloroplast Prrn promoter driving expression of a spectinomycin resistance/green fluorescent protein gene fusion. The cassette was introduced into potato (Solanum tuberosum) suspension cells via particle bombardment and the cells were screened as early as 48 hours for GFP expression. The results
of this study could significantly enhance chloroplast genetic engineering efforts by allowing for rapid testing of chloroplast regulatory elements and by accelerating the screening time of novel chloroplast transformation vectors.

**Poster # 628**

**Geographical location drives the population structure of the native Asian Cornus kousa population**

*Logan Cole Houston*

Student’s Department: Biochem/Cellular/Molecular Bio  
Faculty Mentor: Trigiano, Robert N

Cornus kousa F. Buerger ex Hance is a popular big-bracted dogwood species native to eastern Asia. Cultivars of C. kousa and C. kousa hybrids with North America native C. florida L. are economically important for their ornamental value and superior pathogen response compared to C. florida cultivars. Prior research developed microsatellite markers and analyzed the genetic diversity of C. kousa commercial cultivars. Here, a collection of 130 genomic DNA samples were extracted from current (arboreta) and historical (herbaria; up to 65 years old) plants originating from China, Japan, and Korea. Using 18 microsatellite markers, we assessed the genetic diversity, considering both time and location as factors possibly shaping the population structure. Results of the subsequent population genetics analyses using R suggested that the 5 subpopulations retained Hardy-Weinberg Equilibrium with high gene flow, as expected of an obligate outcrossing species. The analyzed loci demonstrated little linkage disequilibrium. Expected heterozygosity exceeding the observed values and F-statistics indicated minor genetic differentiation. We discovered that C. kousa population structure was influenced primarily by geographic location. As the first exhaustive study of the genetic diversity of wild non-cultivated C. kousa, our results carry significance in their application for future cultivar development.
## Poster Index

<table>
<thead>
<tr>
<th>Student Name</th>
<th>Poster #</th>
<th>Student Name</th>
<th>Poster #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdurehman, Rena</td>
<td>486</td>
<td>Aspden, Chase</td>
<td>211</td>
</tr>
<tr>
<td>Akin, Elgin</td>
<td>626</td>
<td>Atkins, Elizabeth</td>
<td>161</td>
</tr>
<tr>
<td>Akins, Bailey</td>
<td>197</td>
<td>Attar, Auva</td>
<td>75</td>
</tr>
<tr>
<td>Alcorn, Sean</td>
<td>567</td>
<td>Bachmann, Amanda</td>
<td>601</td>
</tr>
<tr>
<td>Alexander, Jayson</td>
<td>20</td>
<td>Bader, Sofia</td>
<td>50</td>
</tr>
<tr>
<td>Alexander, Mckenna</td>
<td>207</td>
<td>Baek, Eunice</td>
<td>212</td>
</tr>
<tr>
<td>Alexis Victoria Case</td>
<td>527</td>
<td>Baird, Aidan</td>
<td>213</td>
</tr>
<tr>
<td>Alikhanova, Dina</td>
<td>38</td>
<td>Baldwin, Amber</td>
<td>185</td>
</tr>
<tr>
<td>Aljundi, Jacob</td>
<td>561</td>
<td>Baljepally, Vinila</td>
<td>214</td>
</tr>
<tr>
<td>Allan, Emeri</td>
<td>168</td>
<td>Bangash, Leila</td>
<td>196</td>
</tr>
<tr>
<td>Allison, Chelsea</td>
<td>139</td>
<td>Banick, Mary</td>
<td>215</td>
</tr>
<tr>
<td>Alloway, Hannah</td>
<td>521</td>
<td>Banks, Emily</td>
<td>192</td>
</tr>
<tr>
<td>Alvaro, Nicholas</td>
<td>78</td>
<td>Bard, Kendall</td>
<td>106</td>
</tr>
<tr>
<td>Ambrose, Alix</td>
<td>561</td>
<td>Barkeloo-Carter, Audrey</td>
<td>216</td>
</tr>
<tr>
<td>Anasky, Samantha</td>
<td>148</td>
<td>Barker, Brandon</td>
<td>503</td>
</tr>
<tr>
<td>Anderson, Erin Scott</td>
<td>160</td>
<td>Barnes, Aya</td>
<td>93</td>
</tr>
<tr>
<td>Anderson, Hannah</td>
<td>156</td>
<td>Barnes, Charles</td>
<td>492</td>
</tr>
<tr>
<td>Anderson, Jessica</td>
<td>539</td>
<td>Barnes, David</td>
<td>578</td>
</tr>
<tr>
<td>Anderson, Joseph</td>
<td>208</td>
<td>Barnette, William</td>
<td>113</td>
</tr>
<tr>
<td>Anderson, Westena</td>
<td>209</td>
<td>Barnhill, Bailey</td>
<td>217</td>
</tr>
<tr>
<td>Andrews, Aubrey</td>
<td>40</td>
<td>Barre, Faith</td>
<td>218</td>
</tr>
<tr>
<td>Anthony, David</td>
<td>551</td>
<td>Bass, Hannah</td>
<td>169</td>
</tr>
<tr>
<td>Apostoaei, Alec</td>
<td>210</td>
<td>Bates, Lajerica</td>
<td>163</td>
</tr>
<tr>
<td>Aranda, Miguel</td>
<td>135</td>
<td>Batts, Kayla</td>
<td>163</td>
</tr>
<tr>
<td>Arowood, Reid</td>
<td>16</td>
<td>Bauer, Jennifer</td>
<td>511</td>
</tr>
<tr>
<td>Arwood, Zachariah</td>
<td>554</td>
<td>Bauer, Jennifer</td>
<td>518</td>
</tr>
<tr>
<td>Student Name</td>
<td>Poster #</td>
<td>Student Name</td>
<td>Poster #</td>
</tr>
<tr>
<td>------------------------------</td>
<td>----------</td>
<td>----------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Beach, Emma</td>
<td>614</td>
<td>Brachter, Samantha</td>
<td>550</td>
</tr>
<tr>
<td>Beasley, Amanda</td>
<td>69</td>
<td>Brandes, Rachel</td>
<td>533</td>
</tr>
<tr>
<td>Becker, Frank</td>
<td>560</td>
<td>Brawner, Anna</td>
<td>229</td>
</tr>
<tr>
<td>Beets, Jordan Katherine</td>
<td>5</td>
<td>Bress, Kimberly</td>
<td>534</td>
</tr>
<tr>
<td>Behrens, Jason</td>
<td>605</td>
<td>Breu, Elizabeth</td>
<td>230</td>
</tr>
<tr>
<td>Bell, Olivia</td>
<td>219</td>
<td>Bridges, Denzel</td>
<td>595</td>
</tr>
<tr>
<td>Bellione, Savannah</td>
<td>498</td>
<td>Bronson, Alice</td>
<td>231</td>
</tr>
<tr>
<td>Benson, Eric</td>
<td>220</td>
<td>Brower, Emily</td>
<td>56</td>
</tr>
<tr>
<td>Bergin, Camille</td>
<td>586</td>
<td>Brown, Emeline</td>
<td>111</td>
</tr>
<tr>
<td>Bess, Daniel</td>
<td>221</td>
<td>Brueher, Savannah</td>
<td>185</td>
</tr>
<tr>
<td>Bialic-Murphy, Coulisse</td>
<td>151</td>
<td>Brummer, Chelsey</td>
<td>551</td>
</tr>
<tr>
<td>Bishop, Jennifer</td>
<td>81</td>
<td>Bruninga, Cassidy</td>
<td>6</td>
</tr>
<tr>
<td>Black, Marlo</td>
<td>222</td>
<td>Bruns, Jessica</td>
<td>232</td>
</tr>
<tr>
<td>Blanks, J Dean</td>
<td>582</td>
<td>Buccelli, Alexandra</td>
<td>74</td>
</tr>
<tr>
<td>Blentlinger, Luke</td>
<td>515</td>
<td>Buckley, Jesse</td>
<td>233</td>
</tr>
<tr>
<td>Blokland, Lara</td>
<td>223</td>
<td>Burnside, Michael</td>
<td>234</td>
</tr>
<tr>
<td>Bloom, Ashley</td>
<td>624</td>
<td>Bustamante, Carolina</td>
<td>235</td>
</tr>
<tr>
<td>Boles, Haley</td>
<td>94</td>
<td>Buttrey, William</td>
<td>584</td>
</tr>
<tr>
<td>Bolinsky, Katelyn</td>
<td>581</td>
<td>Buziak, Melanie</td>
<td>593</td>
</tr>
<tr>
<td>Bond, Alex</td>
<td>152</td>
<td>Byrd, Riley</td>
<td>493</td>
</tr>
<tr>
<td>Bond, Brianna</td>
<td>224</td>
<td>Cable, Miranda</td>
<td>236</td>
</tr>
<tr>
<td>Bondarenko,</td>
<td>27</td>
<td>Cahill, Samantha</td>
<td>532</td>
</tr>
<tr>
<td>Bondarenko, Jennifer</td>
<td>18</td>
<td>Caiole, Mara Celina</td>
<td>41</td>
</tr>
<tr>
<td>Bondarenko, Jennifer</td>
<td>19</td>
<td>Cameron, Alayna</td>
<td>487</td>
</tr>
<tr>
<td>Boone, Kassidy</td>
<td>225</td>
<td>Cameron, Anna</td>
<td>522</td>
</tr>
<tr>
<td>Borgmier, Megan</td>
<td>150</td>
<td>Campbell, Allison</td>
<td>591</td>
</tr>
<tr>
<td>Borsari, Rowan</td>
<td>226</td>
<td>Canfield, Kevin</td>
<td>119</td>
</tr>
<tr>
<td>Bowman, Hannah</td>
<td>227</td>
<td>Cannon, Christopher</td>
<td>237</td>
</tr>
<tr>
<td>Bowman, William</td>
<td>228</td>
<td>Cantrell, Courtney</td>
<td>83</td>
</tr>
<tr>
<td>Student Name</td>
<td>Poster #</td>
<td>Student Name</td>
<td>Poster #</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------</td>
<td>-------------------</td>
<td>----------</td>
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