THIEL

COLLEGE

THIEL COLLEGE STUDENT RESEARCH SYMPOSIUM

SATURDAY

APRIL 18, 2015

PEDAS COMMUNICATION CENTER

THIEL COLLEGE CAMPUS

SYMPOSIUM SCHEDULE

8:30 am	Registration and posters set-up (NOTE Poster Sessions start after talks end) Continental Breakfast, Foyer Area Following Oral Presentation at noon – Appetizers will be served, Foyer Area
9:00 am	Welcome and Opening Remarks Oral Presentations: Concurrent Sessions (Oral Abstracts listed in Symposium Bulletin by room and order of presentation) Presenters give zip drives containing presentations to Moderator at beginning of session to load on the computer

Oral Presentations: Concurrent Session 1

Room: Discovery Room

Moderator:	Dr. James Koshan
9:00-9:15 am	Robert Justin Law (HIST) **The Creation of the Office of the Emperor and Postwar Occupied Japan**
9:15-9:30 am	David Dye (HIST) **Foreign Assistance to the Communists during the Vietnam War**
Moderator:	Dr. Laura Pickens
9:30-9:45 am	Nico Russo, Dlyan Stevens (COMM) **The investigation into why college students fail to use Career Services**
9:45-10:00 am	Kirsten Kluck, Dawn Pastorius (COMM) **Media, bullying, and Mean Girls**
10:00-10:15 am	Kelsey Wise, Benjamin Montozzi (COMM) **Relational Dialectics and the Television Show "Parenthood"**
10:15-10:30 am	Dylan Lasher, Tyler Strite (COMM) **Public Humiliation Today**
Moderator	Dr. Christopher Moinet
10:30-10:45 am	Kayla Cramer (ENG) **The Self in Mythology**

10:45-11:00 am	Sean Oros (ENG) **Sir Gawain's Setting Sun: The Decline of Celtic Gawain in the Face of Foreign Influence**
Moderator:	Dr. Russell Richins
11:00-11:15 am	Zach Strobel (MATH) **The Distribution of M&M's Candies in Colors**
11:15-11:30 am	Kristin J. Patrick (MATH) **A Study of On-Base Plus Slugging**
Moderator:	Dr. Shannon Deets
11:30-11:45 am	Nathan Flory (REL) **Kierkegaard and longing: an investigation of his relation to Regine Olson and subsequent themes in his writing**
12:00 noon	Poster Session

Oral Presentations: Concurrent Session 2

Room: Pedas 125

Moderator:	Dr. Patrick Hecking
9:00-9:15 am	Kayla Langer (PHYS) **Fourier Series Circuits**
Moderator:	Dr. Eugene Torigoe
9:15-9:30 am	Keeley Criswell (PHYS) **Lab Characterization of the LISA Pathfinder Optical Metrology System**
Moderator:	Delbert Abi Abdallah
9:30-9:45 am	Nichole Carlton, John T. Riggans (BIO) **Mutation in the *Escherichia coli dgt* gene and its interrelatedness to other genes**
9:45-10:00 am	Hannah A. Stelmach (BIO) **The effect of a natural supplement on intestinal parasites in alpacas**
10:00-10:15 am	Andrew Gaul (NEURO) **Neuronal Growth in Dystonia Treatments for Rats**

Moderator:	Dr. Fatimata Pale
10:15-10:30 am	Sean M. Byham (BIO) ***Bacillus thuringiensis israelensis (Bti)* Aerial Spray Effectiveness on Black fly (Simulium *jenningsi)* Larvae Populations in Venango and Warren Counties**
10:30-10:45 am	Charles Thomas (BIO) **Injuries Sustained from Both Sprinters and Distance Runners Throughout the Track Season**
Moderator:	Dr. Michael Balas
10:45-11:00 am	Cassandra Cook (BIO) **Using Bioinformatics to Annotate the Pipsqueak Genome**
11:00-11:15 a.m.	Elizabeth McCurdy (BIO) **Cesarean birth rates: a comparison of a northwestern Pennsylvania obstetric/gynecological practice to state and national averages**
12:00 noon	Poster Session

Oral Presentations: Concurrent Session 3

Room: Stamm Hall

Moderator:	Mark DelMaramo
9:00-9:20 am	Derek Runge (HON) **Molecular Resonance**
9:20-9:40 am	Kristen Verina (HON) **The Effects of Autism on Caregivers**
9:40-10:00 am	Cassie Graham (HON) **The relationship between home range and host plants in the butterfly genius *Danaus***
Moderator:	Dr. Melissa Borgia
10:00-10:20 am	Ashley Reynolds (HON) **The educational controversy: what it means to be liberally educated in the 21st century**
10:20-10:40 am	Elizabeth Rice (HON) **Flowertown: A Creative Uprooting of Bullying and Oppression in Society**

10:40-11:00 am	Kourtney Polvinale (HON) **Are Millennials One with the Dao?**
Moderator:	Dr. Cynthia Sutton
11:00-11:20 am	Rebecca Campbell (HON) **The Journey for Answers: a quest to find out the story told by the 158 rocks found along the Eastern shore of Cayuga Lake in Aurora, NY.**
11:20-11:40 pm	Jaclyn Watkins (HON) **Black Twitter: the correlation of cultural backgrounds and social media**
12:00 noon	Poster Session

Oral Presentation Abstracts

The creation of the office of the emperor and post war Japan
Robert J. Law
David A. Buck, Ph.D., Professor of History

The current Office of the Emperor in the Japanese Constitution was the creation of General Douglas MacArthur. During the first twelve months of the occupation, General MacArthur wrote the current Japanese Constitution to preserve and limit the Office of Emperor. MacArthur did this through the authority invested in him as Supreme Commander Allied Powers, Japan. MacArthur made several controversial decisions and short circuited the established oversight regimen to preserve the Emperor. The resulting postwar Office of the Emperor resembles the Pre-Meiji institution.

Foreign Assistance to the Communists during the Vietnam War
David Dye
James Koshan, Ph.D., Professor of History

For the Thiel College Student Research Symposium, I would like to propose my research paper that discusses the assistance given to the Communist side of the Vietnam War. The paper was originally done as a final research paper for a recent class on the Vietnam War, and is currently six pages long, although the paper had been shortened multiple times already and can very easily be lengthened or shortened as required. I have selected this topic because of my interest in the Cold War, and particularly because of the many aspects of the Vietnam War that are either heavily classified or have yet to become well known, such as the rumors amongst many Vietnam veterans that they encountered “Soviet pilots” or “Caucasian Viet Congs.” The paper is divided into three main sections: the first is the economic aid and equipment provided to North Vietnam by the Soviet Union and the other Communist nations, the second section is the heavy foreign involvement in the North’s air and air defense forces, and the third section deals with the presence of foreign soldiers encountered in the field. I think that it is fascinating how Communist ideology motivated not just the Vietnamese, but also multiple other nations to become involved in what would become one of America’s most infamous conflicts.

The investigation into why college students fail to use career services
Nico Russo and Dlyan Stevens
Tiffany Petricini, M.A., Assistant Professor of Communication

Recent research shows that college students are not generally utilizing the career services available to them through their institution. Recent research also shows that college students do not feel prepared for the interview process to obtain entry level jobs. This project was conducted to evaluate Thiel students and their level of preparedness for jobs. By understanding how well prepared Thiel’s students are, we can specifically compare ourselves to colleges across the nation. We used interviews of students to understand levels of preparedness. This was done in a phenomenological approach which can offer unique insights of student preparedness in a small sample size. Our methodology involved creating a small five question interview for all of our students to take.

We interviewed 12 random people of all majors to try and get a small sample from people across Thiel. All interviews had a general format with questions gathering information relevant to providing data. In conclusion our assumption was correct must Thiel students do not feel as if they are prepared for life after Thiel. Each student voiced the same concerns over not providing relevant help to their major. In our opinion Thiel and career services should work to provide useful relevant help to all majors. By helping students of all majors the success rate of graduates attaining work immediately after college will be higher.

Media, Bullying, and Mean Girls
Kirsten Kluck and Dawn Pastorius
Tiffany Petricini, M.A., Assistant Professor of Communication

The following takes a look at bullying through the effects of the film Mean Girls. It encompasses Devito's types of bullying, as well as how they apply to the movie and other forms of media. The film focusses on bullying through high school students and shows many different types of bullying. This also discusses the popularity and effects of the film within the collegiate world. Upon analysis, the bullying shown ultimately has had varying effects on many different generations since it was released in 2004.

Relational Dialectics and the Television Show "Parenthood"
Kelsey Wise and Benjamin Montozzi
Tiffany Petricini, M.A., Assistant Professor of Communication

This paper takes a look at Baxter and Montgomery's theory of relational dialectics in the popular television show Parenthood. An interpretive analysis was used to explore, understand, and interpret the relationships of the main characters in the show using the theory. These include: Zeek and Millie, Adam and Christina, Sarah and Mark, Crosby and Jasmine, Joel and Julia. We will discover through this paper the roller coaster pattern that relational dialectics leaves us with.

Public Humiliation Today
Dylan Lasher and Tyler Strite
Tiffany Petricini, M.A., Assistant Professor of Communication

Some research suggests that humiliation is the most intense emotion for a human to experience. Public humiliation has numerous ill effects on both psychological and physiological health. Social media appears to now be a forum in which public humiliation occurs. To explore this phenomenon, we used a mixed methods approach using surveys, interviews, and interpretive analysis of social media feeds to solidify our data. From this, several themes emerged. First, college students are more likely to partake in the public humiliations of others in an online environment. Second, individuals perceive that they are humiliated more than they partake in the public humiliation of others. Third, the analysis uncovered gender differences in the act of publicly humiliating others. By putting our research together along with comparing to corresponding research we were able to validate our research and believe that this is a good theory that needs to be brought to attention.

The Self in Mythology
Kayla Cramer
Jared Johnson, Ph.D., Assistant Professor of English

The power of storytelling is not something new. Human beings have been creating stories to tell their children for centuries. Some of the earliest stories have become known as myths. What is it about these stories that were created long ago that have caused these stories to continue to speak to readers? In my paper, I discuss how mythological stories represent the outward manifestation of our internal struggle to become the people we want to be. Jung's analysis of archetypes and individual struggle has been used by students of mythology to help explain the deeper meaning of the struggles between characters in these mythic situations. By using Jung's concept of the collective unconscious we can use these stories from mythology not only to look in to the time period that these stories were created but also the mindset of the people who created them.

Sir Gawain's Setting Sun: The Decline of Celtic Gawain in the Face of Foreign Influence
Sean Oros
Jared Johnson, Ph.D., Assistant Professor of English

Sir Gawain, of any literary figure, has certainly had his share of both fame and obscurity. Some of the more common portrayals of the Arthurian Legends, both medieval and modern, revolve around three characters: King Arthur, Queen Guinevere, and dashing Sir Lancelot, the champion of the Round Table. However, ironically, Lancelot was never a part of the Arthurian legends until Chrétien de Troyes introduced him in the 12th century C.E. Before the French addition of Lancelot, Sir Gawain, Arthur's kinsman, was the undisputed champion of the court. However, since the introduction of Lancelot, Gawain has decidedly fallen behind his French comrade in arms in Arthurian lore. Gawain, although an original part of the Celtic legends that Arthur came from, was use in a variety of ways if French-styled romances: at times he was a great hero, but, at other times, he was an inferior foil to Lancelot to show Lancelot's superiority. To better understand this interplay, one must look past the French and Anglo-Norman romances for the traces of the earliest versions of the myths, based on Celtic Brittonic tradition that survived in regions such as Wales. Through exploration of Gawain's independent role from Lancelot, as well as Lancelot's eventual eclipsing of Gawain in Arthurian lore, one may see the influence of medieval French romances upon literature from their own day to today.

The Distribution of M&M's Candies in Colors
Zachary W. Strobel
Jie Wu, Ph.D., Associate Professor of Math

This study is conducted to determine how M&M's candies are distributed in different colors in one pack sold in stores, and try to find out whether the statistics advertised by the manufacturer of M&M's candies on its official website are true. Evidences are collected from a random sample of fifty packs bought in a supermarket for this study. First a goodness-of-fit test is performed to determine whether the actual distribution of M&M's candies in the six different colors matches the advertised distribution, and then a linear regression model is created to estimate the actual percentages of M&M's candies of the six different colors in the order of brown, orange, red, green, yellow and blue.

A Study of On-Base Plus Slugging

Kristin J. Patrick
Jie Wu, Ph.D., Associate Professor of Math

On-base plus slugging known as OPS, is a commonly-used statistic to measure a baseball player's offensive skills. In this study a multiple regression model is built to investigate how closely OPS is related to a player's age, years of experience, field position, number of at-bats, and other feature such as swinging by left-hand or right-hand. The utility of my regression model is tested by an F-test, the correlation between a player's OPS and each of the independent variables is analyzed by a t-test, and the OPS of each currently active player in the next year is predicted by a confidence interval. The population of this study is the major league of baseball (MLB). My sample set consists of more than fifty players, including currently retired and active players in the league.

Kierkegaard and longing: an investigation of his relation to Regine Olson and subsequent themes in his writing

Nathan Flory
C. Thompson, Ph.D., Professor of Religion

Søren Kierkegaard was a Danish philosopher and religious writer who lived in the first half of the 19th century. He is sometimes counted as the forefather of existentialism, as he was often filled with terror and melancholia and served as his own psychologist in many of his writings and journals. This melancholia appeared as a theme not only in Kierkegaard's writing, but in his outer life, as well. Having first met and become infatuated with Regine Olsen in 1837, he initiated interactions as the two became friends, fell in love, and were engaged in September 1840. However, this was the height of their relation. Kierkegaard broke off the engagement in August 1841 for unknown reasons. Some speculate that Kierkegaard saw that he was unfit to be a husband due to his melancholia, and that was his reason for breaking the engagement. Regardless of the reason, the two broke, yet Regine was constantly in Kierkegaard's mind. Much of his writing was done for her, and it could be said that he longed for her his entire life. This presentation examines the intricacies of Kierkegaard's relationship with Regine and its effect on themes in his writing; specifically the pseudonymous work *Concluding Unscientific Postscript to Philosophical Fragments*.

Fourier Series Circuits

Kayla Langer
Eugene Torigoe, Ph.D., Assistant Professor of Physics

The purpose of my senior research was to see how the Fourier series can be represented using two different electrical circuits. The first circuit was a basic RLC circuit. This circuit was tested and shows how the Fourier series can be used using basic electrical components. The second circuit was more complex and again showed how the Fourier series can be used using electrical components. The presentation will be with power point and examples of both circuits working. The presentation will cover how the circuits were tested and explain how they operate and relate to the Fourier series.

Lab Characterization of the LISA Pathfinder Optical Metrology System

Keeley Criswell
Patrick Hecking, Ph.D., Professor of Physics

LISA Pathfinder (LPF), set to launch in 2015, is designed to test technologies that can be used in future space-based, gravitational-wave observatories. LPF contains an Optical Metrology System (OMS) that is used to measure the relative distance between the test masses. The OMS of the LISA Pathfinder currently has a ground model located in Hannover, Germany for testing of the system and system controls before launch. Currently, the system is being changed from analog to digital. This past summer, Keeley Criswell spent two months working to improve the ground model and make the change to a digital system

Mutation in the *Escherichia coli dgt* gene and its interrelatedness to other genes

Nichole Carlton and John Riggans
S.J. Swerdlow, Ph.D, Assistant Professor of Biology

All organisms undergo mutations in their DNA which can lead to an altered expression of a gene. Mutagenesis experiments analyze how these mutations occur and can utilize model systems such as the bacteria *Escherichia coli* (*E.coli*). Recently it was discovered that knocking out the *dgt* gene in *E. coli* resulted in increased mutant bacteria. To further understand the role of the *dgt* gene in *E.coli*, we created bacteria containing a double gene knockout by performing a P1 transduction. A papillation assay was utilized to determine if *dgt* interacts with other genes to cause an increase in mutagenesis. An increase in mutagenesis can be identified by observing the number of blue colonies present on an XPG plate. This study continues experiments to identify genes that interact with *dgt* to determine the role of these genes in preventing mutations. Although the 8 genes used in this study did not show a drastic increase in mutagenesis when combined with a *dgt* knockout, future experiments could be done utilizing other genes with in the *E.coli* genome.

The effect of a natural supplement on intestinal parasites in Alpacas

Hannah A. Stelmach
S. J. Swerdlow, Ph.D., Assistant Professor of Biology

Medications and natural supplements have been used to control and manage parasites on many farms; however, several parasites have become resistant to common deworming medications. The growing resistance has caused more farmers to look in to herbal and mineral options to decrease the parasite loads on their farms. To determine the effectiveness of the natural supplement Bug Check at controlling the parasite load in alpacas, two groups of female alpacas were tested for three months. One group received the Bug Check while the other group was not given the natural supplement. The animal's weights were taken once a week to determine if they lost weight which can be an early indication of a large parasite load. To determine the exact parasite load of the animal, fecal samples were taken and analyzed to find the exact egg count once a month. The weight of the animal and fecal egg counts were not significantly different between animals receiving the Bug Check and those that did not. In this study, the natural supplement, Bug Check, did not significantly reduce the parasite loads of the alpacas. Since Bug Check was not an effective way to prevent parasite infections, new substances need to be tested

at varying concentrations to control parasites especially the ones that are growing resistant to common medications.

Neuronal Growth in Dystonia Treatments for Rats
Andrew Gaul
Greg Butcher, Ph.D., Associate Professor of Neuroscience

For many years, Deep Brain Stimulation (DBS) has been used to treat neurological diseases. The movement disorder dystonia is one of those diseases. When treating dystonia, many patients experience a period of weeks to months before they start to see an effect. This delay period is what we are studying in this experiment. Our hypothesis is that the stimulation from DBS creates neuronal growth in the stimulated areas of the brain; thus, creating a beneficial effect for the patient with dystonia. By stimulating rats in their homologous region to the human stimulated region, we hope to find neuronal growth after close examination of the neurons of the stimulated rats. If neuronal growth occurs as a result of the stimulation, further experiments can be done to see if this growth is the reason it takes so long to see an effect in dystonia DBS treatment.

***Bacillus thuringiensis israelensis (Bti)* Aerial Spray Effectiveness on Black fly (Simulium *jenningsi)* Larvae Populations in Venango and Warren Counties**
Sean M. Byham
Michael T. Balas, Ph.D., Professor of Biology

The effectiveness of *Bacillus thuringiensis israelensis (Bti)* helicopter applied spray operations done by the Department of Environmental Protection (DEP), for black fly pest control, was studied on the Allegheny River during the 2013-2014 years. Samples of black fly larvae were taken at various locations along the Allegheny River before spray operations and were compared to samples taken after spray operations. The collection method for samples was done within the guidelines of the DEP black fly program protocols. Results showed that the spray operations during the 2013-2014 years were significantly within the expected effectiveness of a 90% decrease in larvae population. The results suggest that the helicopter applied *Bti* spray operations done by the DEP black fly program are continuing to be effective at decreasing black fly populations.

Injuries Sustained From Both Sprinters and Distance Runners Throughout the Track Season
Charles Thomas
Michael T. Balas, Ph.D., Professor of Biology

This lab report is the study of track athlete's and the injuries and the severity of injuries that they asses during the track season due to different workout plans. Five male sprinters and five male long distance runners who haven't received a prior injury where the focus of this study. The study focused on seeing if long distance low impact training causes more injury than short distance high impact training. This study also took a measure of femur lengths of all of the athletes that participated to see if there was a positive correlation between femur length and injuries sustained. My predictions given the stats that were taken at the beginning of the season

is that long distance runners will sustain more injuries however they won't be severe because they will be overuse injuries. Because of the length of the track season and the caliber of track athlete I predict that overuse injuries will be prevalent however muscle injuries won't be seen as much.

Using Bioinformatics to Annotate the Pipsqueak Genome

Cassandra M. Cook
S.J. Swerdlow, Ph.D., Assistant Professor of Biology

This project was focused on bioinformatics, which utilizes computer software programs to analyze a genome, by identifying each specific gene and the resulting proteins. DNAMaster which incorporates several different gene annotation systems was used for this project. Annotation of genomes is required to double-check the various predictions of the DNAMaster program and decide if the gene and resulting protein are an accurate prediction. The main focus of the project was to annotate base pairs 19,000-29,000 of the pipsqueak mycobacteriophage genome. It was found that the program predicted the majority of the genes and resulting proteins of the pipsqueak genome correctly. Identifying each gene in the pipsqueak genome will give scientists more insight into how mycobacteriophages function and may lead to the ability to treat bacterial diseases using a phage instead of antibiotics.

Cesarean birth rates: a comparison of a northwestern Pennsylvania obstetric/gynecological practice to state and national averages

Elizabeth S. McCurdy
S. J. Swerdlow, Ph.D., Assistant Professor of Biology

Following a twelve year rise, cesarean section (c-section) birth rates have recently leveled off both at the national and state levels. While vaginal births are inherently safer for both mother and baby, there are some situations where c-sections are deemed necessary. Researching and measuring the c-section rates of individual physician practices allows for a comparison to the national and state averages in order to assess delivery practices. Birth data, specifically the method of birth—vaginal or cesarean—and indications for c-sections were collected from a North Western Pennsylvania obstetric/gynecological practice between January 1, 2013 and December 31, 2013. Using that data, the c-section rate was determined and compared to state and national averages. While the c-section rate of the practice was above Pennsylvanian and national rates, the difference was not found to be one of significance therefore suggesting the practice was in accordance with comparable rates. Determining the main indications for c-sections allows practitioners to reflect and assess upon their practices and helps in decreasing c-section rates, whenever medically possible. The knowledge gained from this study can be used to increase better practices in order to ensure the safety of both mother and baby.

Molecular Resonance
Derek Runge (HON)
Christopher Stanisky, Ph.D., Associate Professor of Chemistry

The resonance energies of two aromatic molecules (phenol and resorcinol) were determined through enthalpy of combustion. Bomb calorimetry was used to obtain experimental values for enthalpies of combustion. These values were compared to similar non-aromatic compounds to determine resonance energy. The experimental resonance energies were compared with conceptual models of resonance.

The Effects of Autism on Caregivers
Kristen Verina (HON)
Cynthia Sutton, Ph.D., Professor of Sociology

Autism is a disorder that interferes with a person's ability to communicate with and relate to others. Out of one in sixty-eight people who have autism, one in forty-two of those are boys. Children and adults with autism experience many struggles with this disorder, yet so do the people who take care of them, or the caregivers. The role of a caregiver is to care for the individual needs of those with autism at any given time. Throughout my interview process, I have met with multiple caregivers who have explained how difficult and time-consuming their role is, yet also rewarding at the same time. Many people see the effects autism has on the individual, however not many people realize autism also affects the caregivers for these individuals. Overall, I have learned the difficulties and realized the strengths personally of some caregivers in my vicinity.

The relationship between home range and host plants in the butterfly genius *Danaus*
Cassie Graham
M.T. Balas, Ph.D., Professor of Biology; B. Parkinson, Ph.D., Professor of Psychology

Seed plants and the insects that feed on them have undergone rapid diversification throughout their existence, leading them to be very successful in generating biodiversity. The purpose of this study was to investigate how the utilization of host plants and the geographic home range of species of butterflies within the genus *Danaus* could have promoted speciation. Data on the number of host plants utilized and number of sites in which the butterflies inhabitant were collected for eight *Danaus* butterfly species. This data was analyzed using a Fisher's exact test and yielded a significant positive correlation ($p = 0.0179$). It is concluded that species with fewer host plants also have a restricted geographical home range. This suggests that speciation within the genus *Danaus* is caused by a restriction in host plants.

The educational controversy: what it means to be liberally educated in the 21st century
Ashley Reynolds
James Koshan, Ph.D., Professor of History

Education in the 21st century remains a trending topic of controversy and a source of frustration for many scholars. The influence of the government and the limitations they enforce on the

educational system serve as a source of questions regarding what it meant to be liberally educated in times past, and what it means today. Does liberal arts education still truly exist in modern times and with more government involvement than ever before? How much has the liberal arts changed over time and do any specific incidents in history catalyze these changes? The meaning of liberal arts has yet to be firmly agreed upon by scholars and others alike, yet it is said to be the paramount form of education in the world. Is this true? If so, what makes liberal arts education different and superior from its counterparts? With the help of a student survey, this research describes many controversial views on the influence of government on education and the morphology of the educational system and the liberal arts over time. This research also depicts the directions in which education is heading and if the liberal arts is indeed superior and whether it will remain the paramount form of education worldwide.

Flowertown: A Creative Uprooting of Bullying and Oppression in Society
Elizabeth Rice
Mary Theresa Hall, Ph.D., Professor of English

This Honors project examines the connection that exists between bullying and nature by using various disciplines—art, poetry, and psychology—in Rice's creative short story titled Flowertown 2015. In this short story, a town has succumbed to its bully, an asphyxiating plant known as Big Ivy, whose purpose is to condemn and overpower those who are artistic, unique, and beautiful. Through struggles against himself, his country, and Big Ivy, the protagonist Mummsie takes a stand against bullying. With literary and artistic creativity and psychological insight, the hero rises against the oppressive society and confronts the bullying problems in his community.

According to the National Bullying Prevention Center, in a typical American school, more than half of all children are bullied, and over 10% of victims are bullied every day. In order to better detail the devastating effects of bullying on adolescents, this Honors project analyzes the psychology of a bully and how to rip up those deep roots. It becomes apparent that bullying is the responsibility of all persons, human or flower, and that this harassment of others delays the advancement of society. The story portrays the necessity of both psychology and creativity in effecting progressive change in human behavior that supports rather than ridicules one's neighbor.

Psychological principles, artistic depictions, and literary expressions convey this thesis. The poems of this literary piece are written in the format of the villanelle, limerick, curtal sonnet, heroic couplets, and journal entries as parallels of the characteristics of the personae of Flowertown.

Are Millennials One with the Dao?
Kourtney Polvinale
Jenni Griffin, Ph.D., Assistant Academic Dean & Professor of Psychology, Beth Parkinson, Ph.D., Professor of Psychology

Presently, our multicultural world is becoming smaller and more conscious, and the social variations between generations have created an age of people whose life principles reflect both Eastern and Western beliefs, as well as modern and traditional values. Eastern belief systems',

specifically Daoism's, presence in the United States can be linked to the spiritual principles present in Ralph Waldo Emerson's contributions to the Transcendentalist literary movement. However, just as the juxtaposition of belief systems and revolutionary period of 19th century industrialization caused reactions within American culture, the millennial generation's culture reflects a similar apposition of Eastern and Western ideals through this modern revolutionary period. Does Daoism, specifically, have a prominent place in our Western Culture through this generation? Also, what does this juxtaposition tell us about the next generation of political leaders, parents, scientists, etc.?

The Journey for Answers: a quest to find out the story told by the 158 rocks found along the Eastern shore of Cayuga Lake in Aurora, NY.

Rebecca Campbell
Anna Reinsel, Ph.D., Associate Professor of Chemistry/Environmental Science

I picked up rocks along the Eastern Shore of Cayuga Lake in Aurora, New York as a child with my family. With the help of the research team at The Museum of the Earth in Ithaca, New York I discovered the stories the rocks with holes and the other rocks had to tell. Some of these 158 rocks that I picked up because I thought they were "cool," turned out to be ancient fossilized sea life. Three hundred and sixty million years ago there was an inland ocean over the northeastern New York, northern Pennsylvania and western Ohio. Species long ago were decimated by a great extinction at the end of the Permian. This life is now preserved in the form of fossils that I found in the northeastern part of New York State. I have glacial erratic rocks from Canada as well as three types of coral, and other types of rock. These rocks are my part of my childhood and I never imagined I would get the opportunity to learn their journey from being sentiment in the ocean, then being covered by glaciers, and years later washing ashore on Cayuga Lake for a curious little girl to research one day.

Black Twitter: the correlation of cultural backgrounds and social media

Jaclyn Watkins
A.M. Hunchuk, Ph.D., Professor of Sociology

In the year 2015, statistics show that a mind-blowing 56% of Americans have a profile on a social-networking site. Sites such as Facebook, Instagram, and specifically, Twitter have become highly popular among citizens of all race, color, and ethnicity. It has evolved into a tool that has changed the way people communicate and perceive each other both positively and negatively. The use of Twitter and other social media websites has led to the creation and growth of cultural subgroups, such as Black Twitter, and has provided a platform for greater unity and awareness of people of different cultural backgrounds throughout the world. This descriptive, exploratory research project sampled Thiel College students and administered a brief spontaneous questionnaire on the awareness of Black Twitter and other cultural subgroups on social media. Results indicate that although variety thrives in social media, most within the Thiel population are not familiar with the massive diversity of social networkers.

Poster Session

Presenters will be present by their posters at the end of the Abstract Presentations. Poster abstracts are listed by number in the Symposium Bulletin. Posters may be removed after the session

Poster Presentation Abstracts

1. **Preferred Baits of Ictalurus Punctatus in Pymatuning Reservoir**
Shane Allen
Michael Balas. Ph.D., Professor of Biology

This study researches the preferred baits of the channel catfish (Ictalurus Punctatus) during the summer months in Pymatuning Reservoir. Catfish have an array of amazing sensory capabilities that are rivaled by none. Dr. John Caprio, a neurophysiologist from Louisiana State University claims that "no fish have more finely honed senses of taste, touch, smell, and hearing to keep them attuned to their environment" (Page, 2007). The sensory capabilities of the channel catfish were put to test with four different types of baits with particular rigging in this experiment. Mature fish use all of their senses to locate an easy familiar meal while juveniles tend to be more bottom scavengers of detritus material. The size of the fish caught and rig used was recorded as well as the sex and time elapsed between catches. It was my hypothesis that the preferred bait choice of I. punctatus would correlate with the size of the fish. I predicted that a large number of fish would be caught using an unnatural bait like chicken liver, only because of the high amount of amino acids and other compounds that will be released into the water as it rests in the bottom muck of the reservoir. However, larger fish should be caught using natural and live baits. My predictions were correct in that larger fish preferred baits natural to their environment and juvenile fish did in fact go after the easiest unnatural bait. A total of 29 channel catfish were caught and recorded. Fish were not recorded if they were of another catfish species or not successfully landed. The results of the experiment showed that larger mature fish did in fact prefer a natural bait like cut bluegill or minnows while juveniles were caught more on unnatural baits like chicken liver. The research that I have proposed will grant a better understanding of how to use science as a tool to catch channel catfish. It may help explain why certain baits and methods have different outcomes in terms of the size and quantity of fish caught.

2. **Music Therapy and its Effects on Alzheimer's disease**
Natasha Barber, Kelley Bellia, Amanda Hautmann, Ryan Weldon
Greg Butcher, Ph.D., Associate Professor of Neuroscience

Currently an estimated 5.2 million people are affected by Alzheimer's disease and is the sixth leading cause of death in Americans. Alzheimer's disease has become a target for music therapy to help alleviate symptoms such as agitation, aggression, or depression.

The current study sought to investigate if a customized music selection would have a greater positive outcome on a patient's psychological state than the usage of a generalized music selection or a conversation session. Fifteen residents from a local nursing facility were sorted into two experimental groups which included a customized music selection, generalized music selection, and a control group consisting of just conversation sessions. The Mini Mental State Exam (MMSE) was administered at the preliminary and debriefing sessions, whereas the Neuropsychiatric Inventory Questionnaire (NPI-Q) was administered during each therapy session to track the effectiveness of the sessions. If the customized music selection has a greater effectiveness on the scores of the MMSE and the NPI-Q then the study will suggest that a customized selection may improve the quality of life in Alzheimer's patients.

3. **The effectiveness of different caffeine levels on mice activity**

A.L.Buchanan
N.G.Despo, Ph D., Professor Emeritus of Biology

In this experiment, the effect of caffeine levels on the wheel running activity of mice was tested. In human subjects, caffeine can act as a stimulant to the central nervous system and cause increased alertness, heart rate, breathing and blood pressure. This too has similar effects on animals. Twelve mice were divided into three groups; one group served as a control, one group was exposed to 200 mg caffeine, while group three was exposed to 400 mg caffeine. The caffeine was administered *ad libitum* in the drinking water for a period of three weeks. The controls received non-treated drinking water. The weekly daytime and nighttime activity of each mouse was accessed using activity wheels outfitted with a mechanical counter that recorded revolutions of the wheel. The results show that caffeine exposure significantly increased the nighttime activity of the mice during weeks two and three but had no effect during the first week of exposure. Additionally there was no difference in nighttime wheel activity in the groups receiving the doses of caffeine during weeks two and three. Further experimental could be done to determine the dose of caffeine needed to manifest the heightened nighttime activity as well as to determine if there is a plateau effect regarding caffeine dose exposure.

4. **Utilizing Mycobacterium smegmatis to Isolate Novel Mycobacteriophages from Soil**

Colt Capan, Shay Kashey, Anne Mullhausen, Amanda Callahan, John Grondwalski
S.J. Swerdlow, Ph.D., Assistant Professor of Biology

Bacteriophages are viruses which infect a specific kind of bacteria and are known to be an immensely diverse population. In the early 2000s, very few bacteriophages (phages) had been identified and their genomes sequenced. However, recently hundreds of phages have been discovered from environmental sources, such as soil or water and their genomes have been either partially or fully sequenced. The object of this research was to isolate novel mycobacteriophages that are naturally present in soil that has sufficient moisture and organic decay. The bacteria that was used for isolation and purification of the mycobacteriophages was Mycobacterium smegmatis (M. smegmatis). Utilizing protocols from The Mycobacteriophage Database, multiple soil samples, along with one water sample, were collected to isolate the phages. Unfortunately, no areas of viral activity were identified from these samples and therefore the phages could not undergo

further purification and analysis. We concluded that more soil samples would be required in order to increase the chance of isolating a phage. This research is of growing interest for many reasons two of them being: to gain a better understanding of phage genetic diversity and future use in treating antibiotic resistant bacteria.

5. **The amount of bacteria found on fish from different habitats**

Troy W. Elsea
S.J. Swerdlow, Ph.D., Assistant Professor of Biology

Bacteria is a microorganism that can be found in almost any environment however, most research regarding different types of bacteria and fish are mostly focused on the internal microflora instead of the bacteria on the scales of the fish. The purpose of my experiment is to determine what type of habitat has more of a variety of bacteria growing on the bass. Bass were obtained from three different habitats including a river, sea, and pond. The scales of the bass were then swabbed and then inoculated into a bacterial growth medium. The samples were then isolated on a commonly used general purpose nutrient agar plate. The river and sea each had three different types of bacteria while the pond only had two different bacterial organisms that were able to be isolated in 48 hours at 25°C. In this experiment the river and sea had more different types of bacteria growing on the scales of bass however, it is highly likely that more bacteria could have been isolated if the bacteria was grown under different conditions. This experiment shows that although the pond had one less type of bacteria, all three habitats were relatively similar and that further research would be required to identify the specific strains of bacteria found on the fish scales.

6. **Investigating the role of physical attributes, scent, and context in human mate selection**

Courtney J. Fatta and Mandalynn R. Slupek
Greg Butcher, Ph.D., Assistant Professor of Neuroscience

Olfactory cues are used in many species of animal as signals, and evidence is piling that humans are no exception. While the existence of human sex pheromones is still debated, multiple studies suggest that scent is related to the gene for the major histocompatibility complex, important in the immune system, and it influences mate choice. People are more likely to rank scents of individuals with slightly varied versions of the gene from their own as more attractive. It has also been shown that females prefer men with more feminine faces for long-term relationships and more masculine faces for short-term relationships. It is speculated that this is because masculinity of the face is linked to testosterone levels and testosterone to aggressive behavior. Our study examines whether or not the long- or short-term context of a relationship influences the perceived attractiveness of a scent, as well as the correlation of similar physical traits to attractiveness rankings.

7. **Effect of Thiel College football strength and conditioning program on player strength**

Chase Good
S.J. Swerdlow, Ph.D., Assistant Professor of Biology; D.M. Duriancik Ph.D., Visiting Assistant Professor of Biology

Strength and conditioning has been demonstrated to improve performance in team sports. In this study I hypothesized subjects performing the recommended training would have significant increases in maximum lifts. Subjects were tested for one repetition maximum squat, bench, and power clean to determine overall strength by the Thiel College football team. The subjects performed the recommended training program that included a form of clean, a core lift, and several auxiliary lifts. There was a significant increase in strength as determined by paired t-test comparing pre and post program maximum lifts. Based on this data, the Thiel College football strength and conditioning program should stay in place to keep meeting team goals of strength, conditioning, and injury prevention.

8. **Worms**

Aaron Herman
Michael Balas, Ph.D., Professor of Biology

I performed an experiment to see how much soil saturation was needed for earth worms to emerge from the soil. My hypothesis was as the soil became more saturated; more worms would emerge from the soil over the time frame of 30 minutes. To conduct this experiment, I got equal size containers, soil, and worms. I took the four containers and filled them up with equal amounts of soil in each container. Then I took one of the containers and tested to see how much water it took to completely saturate the soil and then I cut the amount into fourths. After seeing that it takes 3 L to saturate the soil I discarded the saturated soil and refilled the container. I then added 25 worms to each container and allowed then to adjust for 15 minutes. Then I added the different amounts of water to each container. The worms that were close to the surface emerged immediately in all of the containers. Then by observing the worms for 30 minutes, I looked to see if any other worms would emerge. Worms in both the 25% and 50% container remained active on the surface over the time span. But in the 75% and 100% containers, the worms stopped moving on the surface after 75% saturation was reached. Only a few more worms emerged in only the 25%, 50%, 75% containers before 30 minutes was reach. However surface activity was still only in the 25% and 50% containers. After the 30 minutes was up, a total worm count was taken to see how many worms emerged from the soil in each container. The total amount of worms in the 25% saturation container was 11 worms. For the 50% and 75% containers, a total of 10 worms emerged. Finally for the 100% container, a total of 9 worms emerged. These results were unexpected and do not support my hypothesis. These results also show that the worms that are close to the surface reacted immediately when water was added. Also that more worms emerged with the less soil saturation and stayed more active on the surface than the worms with more soil saturation.

9. **The effect of tree diversity on the biodiversity of ant species in two differing areas**
Timothy Hutton
Michael Balas, Ph.D., Professor of Biology

Tree diversification in an area has an effect on the number of animal species that are found there as well. It is hypothesized that there is a direct correlation between the number of tree species to the number of ant species in the same area. This report studies the effect of tree diversity on the diversity of ant species. Two wooded areas of Thiel College were sampled for tree and ant diversity. Roadhouse Woods was selected for high biodiversity, as 8 species were found in our tree sampling. East Acres was selected for its lower number of tree species and high prevalence of Red Maples. Winkler sacks were used to collect 10 leaf litter samples in each site. The collected ant species were sorted, identified, and counted. 10 different ant species were found in Roadhouse Woods, and almost every species was in higher abundance for a total of 170 individuals. 7 of the 10 species were found in East Acres, with a total of only 35 individuals. Using the data from each site, Chi-Squared tests were performed on each ant species found. For some of the species, the null hypothesis was rejected. However, most of the species were inaccurately concluded to have no difference between sites because the low numbers observed make it impossible to find an accurate trend. Overall, our hypothesis was supported from the obviously higher biodiversity and quantity in Roadhouse Woods. To increase the accuracy, more sites could be sampled, along with an increase of samples taken.

10. **Evaluation of Solvent Systems for the Extraction and Separation of Carnosic Acid From Rosemary**
Kaile Jump
Kathryn Frantz, Ph.D., Professor of Chemistry

The experiments and research performed in this study were done to determine the best solvent system for the extraction and separation of carnosic acid from crude rosemary oil. Carnosic acid has shown tremendous potential in medical industries due to its natural antibiotic properties as well as potential to prevent the onset of certain cancers and Alzheimer's disease and also in the food industry as a natural preservative. Carnosic acid (crude oil) was obtained from rosemary powder via soxhlet extraction and the constituents were isolated using silica gel column chromatography. TLC plates were used to identify carnosic acid and HPLC was used to test its purity and concentration.

11. **Cross-Sex Friendships in Selected Psychological Experiments and Literature**
Tina Kramer
Shannon Deets, Ph.D., Assistant Professor of Psychology

The purpose of this evaluation was to compare and analyze three pieces of psychological literature, all of which focus on the topic of cross-sex friendships. Each study evaluated had some similarities as well as differences in their findings. There was a variety of questions answered within each study because each dealt with unique aspects of cross-sex friendships. Things such as sexism, relationship commitment, communication, and

gender role orientation were all under examination within one or more of these articles. These three articles combine several pieces of the total idea of cross-sex friendships to create a basis for understanding their complexity. The first article covered a variety of issues, including elements outside and within the cross-sex friendship, including social views and their effects on setting relationship boundaries. The next study examined the participants' views of the cross-sex friendship in relation to communication within the friendship, especially each party's intent, whether romantic or otherwise. The final article studied the effect of gender role orientation on cross-sex friendships, offering an explaining of the role of male versus female qualities in an individual seeking friendship. Not all results have been tested multiple times, so some results are either unclear or contradict each other, though most are complementary. To eliminate some inconsistencies, more studies should be conducted and analyzed. Cross-sex friendships are deeply complicated in concern of formation and maintenance. Many factors influence whether individuals desire and pursue these relationships to form and maintain them, for these studies are just the beginning.

12. **Fourier Series Circuits**

Kayla Langer
Eugene Torigoe, Ph.D., Associate Professor of Physics

The purpose of my senior research was to see how the Fourier series can be represented using two different electrical circuits. The first circuit was a basic RLC circuit. This circuit was tested and shows how the Fourier series can be used using basic electrical components. The second circuit was more complex and again showed how the Fourier series can be used using electrical components. The poster that was created shows both of these circuits and explains them using pictures taken and equations. The poster also covers the mathematical part by showing what the Fourier series looks like and an example of it.

13. **Malala Yousafzai: Power Citizen**

J.M. Lippert
D.R. Buck, Ph.D., Professor of History; J.C. Koshan, Ph.D., Professor of History

Malala Yousafzai is currently a seventeen year old Pakistani activist for the global support of providing education for all women and children. Her influence in this activist movement has been so significant that she was co-awarded the Nobel Peace Prize in early 2014, successfully recognizing her as the youngest-ever laureate. Her story combined with her humanitarian based efforts through non-violence and peaceful communication has elevated her to an inspirational level. Malala was targeted as an adolescent by Taliban forces for her enthusiasm in education, in an area where education particularly of women is met with great unwelcome and hostility. She was physically attacked in 2012, but miraculously survived with only scars to show. This event became the foundation of Malala's campaign that was launched into global spotlights, working against the Taliban's efforts to silence her. Since then, Malala has gained considerable support from activist politicians, the United Nations, and many national governments. Her campaign

has also spread from the education to the general health and safety of women and children around the world.

14. **Examination of Vitamin D2 Content in Mushrooms**
Meghan Martin
Anna Reinsel, Ph.D., Assistant Professor of Chemistry/Environmental Science

The lack of vitamin D in elderly humans has recently been linked to dementia. Common foods can contain a certain amount of vitamin D2 that may be able to prevent the occurrence of the disease. One common food that is being recognized for its potential for vitamin D2 content is portabella mushrooms. The analytical assessment of vitamin D2 content in commercial portabella mushrooms will be presented. Extraction methods and conditions were tested using a simulated portabella mushroom mixture containing vitamin D2, soy protein powder, calcium carbonate, and glucose. A soxhlet extraction with methylene chloride as the solvent was conducted to extract the vitamin D2 from store bought portabella mushrooms. HPLC was used to determine the vitamin D2 content in the mushrooms.

15. **The effects of temperature on the germination of food crop seeds**
W.W. Schmidt
F.A. Palé, Ph.D., Professor of Biology

Corn and wheat are two of the largest crops that are harvested for human consumption in the world. Clover could also be considered a food crop even though it does not feed humans. Many consider clover a weed, but it is important as a cover crop. It is used as a crucial food source for animals, which humans eat. The crops grow ideally at certain temperatures, but with the rise of global temperature, their growth could be affected. It was hypothesized that there would be an association between the type of seeds and their optimum temperature of growth. Corn, wheat, and clover seeds were germinated for seven days at a time. This process was done at five temperatures of 4°C, 15°C, 25°C, 30°C, and 35°C. The percent of seeds germinated was calculated to give insight on the temperature of germination. Corn (73%) and wheat (63%) grew best at 30°C. Clover (80%) grew best at 15°C and 25°C. A chi-square test was run on the final results, and it determined that there was an association between the type of seed and the temperature at which they germinate the best. This experiment gave insight on how the ever rising global temperature could affect the germination of crops.

16. **Observational learning in juvenile Canis familiaris subjects**
Callie Shilling
Michael Balas, Ph.D., Professor of Biology

Observational learning is the concept of learning behaviors or tasks from one another, usually by observation of that task being completed by another individual. The human race is not the only animal species that is capable of observational learning. Canis

familiaris, or the domesticated dog, is also capable of learning by this method. Dogs can learn at an incredible rate, learning many different commands and behaviors that is beneficial to humans. Humans have used canines as tools and companions because they do have that ability to learn and retain information over a long period of time. While dogs do have the natural propensity to learn from humans, they also learn from each other in a group setting. This experiment tested that naïve puppies can learn an expected behavior from other dogs. A sample size (n=8) of dogs were brought into a setting and times were recorded for how long it took them to sit, demonstrated by their sister. Over the period of three days, five trials were conducted with groups of two 'students' and the 'teacher', the 'teacher' was asked to sit verbally and with a physical command and rewarded with a treat when the action was completed, if the 'students' also sat, they would be rewarded as well. The hypothesis was supported by the data that concluded that all but two naïve puppies responded to the commands after the three day period without the inclusion of the teacher dog.

17. **Estimated Phantom Energy Consumption of Some Everyday Electronics**
Eric Wolf
Anna Reinsel, Ph.D., Professor of Chemistry & Environmental Science

Phantom Energy is a term that describes the amount of electricity that a device consumes while it is "switched off" or in a sleep mode. Phantom energy is also referred to as standby energy or even sometimes vampire energy pull. The reason why our devices use a measurable amount of energy while they are in a dormant stage is due to a convenience factor of the electronic device. Small amounts of electric current are used to keep the device ready so that it may easily and quickly respond to control without delay. This standby electricity consumption takes up a lot of energy on a larger scale. The United States government states that nearly 10% of our electricity consumption is derived from standby energy which results in nearly $3 billion dollars a year. The main purpose of this experiment is to hopefully spur a realization in individuals about the effects of standby energy and what the convenience factor of their devices has on not only themselves but on the environment as well. This is because coal is leading the way in electrical energy production every watt of electricity we use is consequently balanced by an amount of CO_2 released into our atmosphere. Maybe if saving money doesn't inspire change saving the planet will.

18. **Breathing patterns at Thiel College**
J. A. Yozwiak
Michael Balas, Ph.D., Professor of Biology

Studies at universities worldwide have ranked pollen and mold, respectively, as the top two outdoor allergens to engage an Asthma attack. These allergens, along with weather patterns, are important to monitor. Knowledge of these allergens can help ease a student's walk to class and knowing if a possible Asthma attack can occur. This, in turn, will reduce the number of class absences a student has if they are prepared to find another means of transportation. Thiel College was studied in comparison to these universities worldwide. It was hypothesized that the three tested allergens would be most similar in

statistical results to a previously studied Midwestern university. It was also hypothesized that the three allergens would follow a pattern of high counts for the first three testing dates and low counts for the last two testing dates. Weather patterns were monitored and tested respectively via thermometer and visual testing. Rod testing was used to gather the pollen and mold counts. A correlation analysis of the worldwide universities allergen counts to Thiel College was conducted. High counts of pollen and mold were most similar to the Midwestern university, over a span of the five testing dates. No significant differences existed from any of the three tested allergens from any university to Thiel College. High counts of pollen, mold, and weather patterns were apparent in the early testing dates. Low counts of these allergens were apparent in latter testing dates. These results suggest that college campuses, worldwide, are facing the same environmental factors.