Gordon State College

Undergraduate
Research
Symposium

Program and Abstracts

Friday April 14, 2023

PROGRAM OUTLINE

Podium Presentations: 9:30 am – 10:30am
NAHS 114

Break: 10:30 – 10:45

Podium Presentations: 10:45 am – 11:30am
NAHS 114

Lunch Break: 11:30am – 1:00pm

Poster Presentations: 1:00pm – 2:00pm
NAHS 123

Awards Ceremony: 2:30pm
NAHS 123

ACKNOWLEDGMENTS

The Undergraduate Research Symposium Committee would like to thank: President Nooks, Provost Ardovini, the judges, and the faculty mentors of our presenters.

The Undergraduate Research Symposium Committee is made up of:
Dr. Amanda Duffus (Chair)
Dr. Alan Burstein
Dr. David Janssen
Dr. Joseph Jones
Dr. John George
Dr. Stephen Powers
Mrs. Melanie Mertz

Podium Presentations: 9:30am – 11:30am

NAHS 114

9:30 – 9:45
W. Godat - ***Natural Parks in the Literature and Subconscious of the American Gilded and Progressive Ages***

9:45 – 10:00
E. Hill - ***Return to Paradise: An Exploration of Eve as a Protagonist in British Literature***

10:00 – 10:15
A. Jaiswal - ***pH Meter Testing: Evaluating Label Claims of Common Alkaline Water Brands***

10:15 – 10:30
M. Sanders - ***Shrek and Subversive Storytelling***

10:30 – 10:45
Short Break

10:45 – 11:00
S. Jones - ***A Comparison of COVID-19 to the Spanish Flu Epidemic***

11:00 – 11:15
J. Jenkins - ***An exploration of the modern day gardening boom***

11:15 – 11:30
R. Rider - ***Finding the Light***

Lunch Break: 11:30am – 1:00pm

Note: Lunch is NOT provided.

Poster Presentations: 1:00pm – 2:00pm

NAHS 123

Awards Ceremony: 2:30pm

NAHS 123

Podium Presentation Abstracts

Natural Parks in the Literature and Subconscious of the American Gilded and Progressive Ages

Presenter: William Godat

Faculty Mentor: Dr. Doug Davis

The history of environmentalism in the United States of America is largely rooted in the idea of the United States as an exceptional nation culminating in the foundation and rapid expansion of national parks throughout the late 19th and early 20th centuries. However, little has been done to link the drive of the Progressive era to protect the natural environment to both the contemporary literary movements, such as naturalism and realism, as well as those of previous decades, such as romanticism. This research shows that there is a direct correspondence between the ecological and literary giants around the turn of the century, as well as great influence from the authors of previous decades that inspired the growth of the idea of “American Exceptionalism” as it relates to the natural landscape, ecology, and biodiversity of the United States in the conscience and wider imagination of both the American public as well as in the minds of government officials. This presentation will display how the literary movements of romanticism, naturalism, and realism directly contributed to the growing movement of environmentalism in the United States. This project investigated many books on the subject of the founding of America’s National Park System, primarily Roderick Frazier Nash’s *Wilderness and the American Mind* and Alfred Runte’s *National Parks: The American Experience* amongst many others. Ralph H. Lutts’ book *The Nature Fakers: Wildlife, Science, and Sentiment,* which displays direct correspondence between leading figures in American ecology and politics, such as Theodore Roosevelt and John Burroughs, and celebrity authors such as, William J. Long and Jack London, was vital to this project as well. Many short stories and essays written throughout the 19th and early 20th centuries by America’s leading literary giants were also investigated for this project. They include Jack London’s “To Build a Fire”, Frank Norris’ “A Plea for Romantic Fiction”, Stephen Crane’s “The Open Boat”, Walt Whitman’s “Song of Myself”, and various poems by William Cullen Bryant amongst others. This project and its research are important as it strives to encourage continued respect and admiration for America’s natural spaces as well as to promote awareness of the truly exceptional nature that can be found within the United States of America. There is growing collaboration within the fields of the humanities between literary and historical scholars. This project will serve as a bridge between the two.

Return to Paradise: An Exploration of Eve as a Protagonist in British Literature

Presenter: Elizabeth Hill

Faculty Mentor: Dr. David Janssen

This project challenges the classical interpretation of Eve, a character who has traditionally been presented as a weak and devious "temptress." It references many classical works found throughout British literature and seeks to dissect Eve's role in them. Specifically, it focuses on three of English literature's greatest epics and their representations of Eve: *The Canterbury Tales, Sir Gawain and the Green Knight,* and *Paradise Lost.* In *The Canterbury Tales*, the Wife of Bath constitutes as a parallel representation of Eve, and she offers a defense of Eve and her representation of the female sex. This project also explores the sense of identity these two characters share: an identity contingent upon their husbands. In *Sir Gawain and the Green Knight,* Sir Gawain (a traditional epic hero) blames the sorceress, Morgan le Fey, for his failure in his quest. He attempts to reassign his blame to her, saying she was his downfall just as Eve was Adam's. *Paradise Lost* is perhaps the greatest representation of Eve in British literature. John Milton gives an incredible insight to Eve and offers a full view of her characterization and psyche (including the effect of Knowledge). Many scholars interpret *Paradise Lost*'s climax to be when Eve eats the Fruit of Knowledge. If this is the climax, as some scholars contend, Eve *must* play a larger role in the story than simply a temptress; she is the instigator of action and, arguably, the true protagonist. Despite Milton's attempts to also paint Eve as the traditional "temptress," he instead reveals a much greater, higher, and more noble truth – Eve is an epic heroine. This project hopes to take its reader back to where it all began, and dismantle improper interpretations of British epics and their stereotype of Eve (and thus the female sex). This project is an epic journey of its own – a return to Paradise.

pH Meter Testing: Evaluating Label Claims of Common Alkaline Water Brands

Presenter: Aastha Jaiswal

Faculty Advisor: Dr. Cristina Fermin-Ennis and *Mentor:* Dr. Amanda L. J. Duffus

To be considered basic, water must have a pH value that is higher than its neutral value within an individual pH range. Water at the standard state temperature of 25°C has a pH range of 0 to 14 with a neutral pH at 7. However, as temperature fluctuates, the pH range and neutral pH changes also. Because of this, pH without a temperature reading is unclear. In this study, ten popular brands of alkaline water were chosen and tested for pH and temperature with an Oakton PC700 meter to help elucidate which brands are fulfilling their individual pH label claims at room temperature. Over the course of two trials using the same sample bottle, it was determined that most brands fail to meet packaging claims at room temperature. Only two brands were successful in both trials, two brands succeeded in only one trial, and the remaining six brands were not successful. This puts great responsibility upon the consumer; alkaline water is more expensive than regular bottled water. Hence, if the buyer wishes to purchase water that lives up to package claims at many temperatures or at a specific temperature, they should choose brands carefully. A price per fluid ounce comparison was conducted to aid consumers with finding a brand that fulfills consumer wants at the cheapest price.

An exploration of the modern day gardening boom.

Presenter: Jerica Jenkins

Advisor: Dr. Alan Burstein

Today's modern gardening boom is a cultural phenomenon that is influencing the way many people think about food. Home gardening has been on the rise in recent years especially in the wake of the pandemic, with a reported 18.5 million new gardeners in 2021. Today more people than we have seen since victory gardens were established in 1917 are maintaining a home garden. There are both economic and social factors that are working to stimulate this boom, as was the case in the past. My research suggests that the biggest factors that are currently influencing the boom seem to be; food insecurity, inflation, and supply chain shortages. A common thread between this current boom and victory gardens is the uncertainty of the economic and social environment. It is not simply people located in rural or suburban areas that are maintaining gardens; people in urban areas are doing the same, as noncommercial food producing gardens such as allotments, community gardens and kitchen gardens increasingly appear. While there are many reasons why gardening has become more popular in the 2020s, the majority of people seem to start a garden in order to have a readily available food source.

A Comparison of COVID-19 to the Spanish Flu Epidemic

Presenter: Sarah Jones

Faculty Mentor: Dr. Alan Burstein

In recent times, the COVID-19 pandemic has had a significant negative impact on the economy, population, and way of life of the people in the United States. However, one hundred years prior, the Spanish Flu of 1918 had devastating effects comparable to those of the more recent pandemic. Each pandemic was devastating in their own respective era, but each was unique in the significance of the impacts they caused. During Covid-19, the media often dramatized how much worse the current pandemic was than the Spanish Flu using flawed logic to prove a point. It is potentially true that Covid had more drastic economic effects; however, in relation to mortality, the Spanish flu was undeniably worse. Both pandemics negatively affected the economy, the population, and the culture; however, because 100 years passed between each, there was much technological progress that took place which could have potentially made the response to the latter pandemic more organized and effective. This presentation will be an investigation of both pandemics and will come to a conclusion about which was worse in relation to the economy, the population, and the culture. To research this issue, historical sources, scholarly articles, and media coverage will be considered.

Finding the Light

Presenter: Riki Rider

Faculty Mentor: Dr. Alan Burstein

Dystopian literature is a genre that explores some of the darker sides of humanity and depicts a state of the world in which society is in decline. Such literature is often composed with specific ideologies in mind like Malthusian or Neo-Malthusian views of overpopulation, and with these perspectives fueling the stories, this genre can come off as frightening. By exploring these specific perspectives that inspire such literature, I will discuss whether or not the stories of this genre should frighten us, and I will discuss whether or not a light can be found in Dystopian literature.

I will be conducting a critical analysis where I will investigate dystopian views of overpopulation in novels as professed in the 1960s through 1970s. In my research, I will discuss the demographic perspectives that influence literature like "The Population Bomb" (not fiction), "Make Room! Make Room!", and other works while exploring what these literary works get right and what they get wrong. I will integrate qualitative and quantitative data along with material from the demography class I took last fall to evaluate specific ideas. Most dystopian work receives a dismal and gloomy response from readers, so it is my intention to show how a change in perspective can shine light on the darker themes in dystopian literature.

Shrek and Subversive Storytelling

Presenter: Michael Sanders

Faculty Mentor: Dr. Jane-Marie McKinney

This essay is an analysis of the movie Shrek, specifically Fiona's character, through Charles Cooley's theory of the looking glass self. Throughout the essay I provide some context for the movie and use various academic references to support the connection between Fiona's character and Cooley's theory. It starts with a light analysis of Smashmouth's Allstar. Then a summary of the plot, after which the actual analysis begins. I start the analysis by outlining and highlighting various points of interest about her character that are relevant to the analysis, and then dig deeper and flesh it out until the conclusion.

Poster Presentation Abstracts

Adaptations of *Ambystoma tigrinum virus* in western North American amphibian populations

Presenter: Katelyn Fowler

Faculty Mentor: Dr. Amanda L. J. Duffus

Ranaviruses are double-stranded DNA viruses that infect amphibians and reptiles. It causes an overall decline in health in the affected organisms, with symptoms ranging from lethargy to limb necrosis. This virus is the only one in the family *Iridoviridae* that infects amphibians, while the other viruses in this family infect fish, reptiles, and insects. Many different ranavirus species are found in North America, but *Ambystoma tigrinum virus* (ATV) is contained in the western portion. This study focuses on analyzing ten genes of Ambystoma tigrinum virus and further evaluating 15 isolates from each of those genes. These complete genome sequences and their isolates were collected from GenBank and then aligned using the MAFFT server. The aligned sequences were then imported into MEGA X to build the best nucleotide substitution model and then constructed a Neighbor-Joining tree from said model with 1000 bootstrap replicates. These trees were compared to identity evidence of local adaptations within the genetic sequences. The focus of this study is part of a larger project that will eventually examine all 95 loci in ATV for local adaptations and perform numerical taxonomy to determine if more loci are helpful in examining small-scale adaptations.

Development of myoglobin concentration in Manatee calves

Presenters: Katelyn Fowler and Kiara Mitchell

Faculty Mentor: Dr. Cori Newton

Myoglobin is a protein found in the cardiac and skeletal muscles of vertebrates. Its high affinity for oxygen makes it crucial in the storage and transport of oxygen in the body. Organisms such as cetaceans rely heavily on their myoglobin content to achieve maximum dive capacity. Unlike organisms, such as fish, which have organs that allow them to obtain oxygen from the water, marine mammals lack these structures. They cannot collect respiratory oxygen during diving episodes. However, they have evolved the ability to store increased levels of oxygen in tissues such as muscle that can be utilized for energy production during dives. Higher levels of myoglobin in muscle tissue increase oxygen levels for this purpose. Elevated amounts of myoglobin in the locomotor muscles compared to terrestrial animals have been well documented in many marine mammals. However, limited data has been collected on myoglobin levels of the swim muscles of different age groups of the Florida manatee (*Trichechus manatus latirostris*). To provide information about myoglobin levels in developing Florida manatees, stranded muscle tissue from manatee calves have been collected, and myoglobin levels have been quantified. A spectrophotometer is used to determine the myoglobin concentration at two different wavelengths, which measures the amount of light the sample absorbs. Preliminary results show that calves have a myoglobin concentration of 1.7 mg/g, which is approximately 70% of calculated adult values. These results show that manatee calves are not born with mature levels of myoglobin but instead develop increased levels of this protein in swim muscle as the calf ages.

Using the *Ambystoma tigrinum virus* as a model to search for signals of local adaptation in ranaviruses

Presenter: Ashley Hyde

Faculty Mentor: Dr. Amanda L. J. Duffus

Ranaviruses are globally emerging infections contained within the viral family *Iridoviridae*. They are large, double-stranded DNA viruses known to affect amphibians, fish, and reptiles. This viral group is widely distributed in North American amphibians, with the *Ambystoma tigrinum virus* (ATV) being primarily located in the western portion of the continent. We examine 10 loci for local adaptation, through the utilization of 15 published genome sequences, that have been used in previous studies to indicate local adaptation of this viral species located in the west. Sequences obtained from GenBank, were aligned using MAFTT, imported into MEGA X, where the best fit nucleotide substitution model was calculated, and then a Neighbor-Joining tree was created for each locus. Trees were visually compared to a tree build using the whole genomes of the 15 published isolates and the previously published tree that showed local adaptation. During sequence analysis, it was noted that at several loci, there is evidence of duplication events, which may be due to recombination between different isolates of ATV at the site of collection. This is part of a larger project that will eventually examine all 95 ATV loci for signals of local adaptation as little is known about this process in ranaviruses, let alone all the loci which could potentially be used to measure local adaptation in these isolates.

Characterization of the locomotor muscle myoglobin concentration of the Florida manatee

Presenters: Aastha Jaiswal, Mary Macias, and Andru Scray

Faculty Mentor: Dr. Cori Newton

To sustain adequate oxygen supplies while diving, many marine mammals are dependent upon high myoglobin levels within their locomotor muscles. The increased oxygen level allows the muscle to extend more efficient energy-producing pathways, enhancing diving duration. Unfortunately, a limited amount of information is available on myoglobin concentrations of the locomotor muscles (swim muscles) of the Florida manatee (*Trichechus manatus latirostris*). Therefore, this ongoing study aims to calculate the average myoglobin levels in locomotor muscle tissue obtained from adult subjects. The samples were collected from the swim muscles of stranded Florida manatees by local stranding networks. The muscle samples were homogenized, and spectrophotometry analyses were performed. Results were then plugged into the myoglobin calculation formula: $mg/gram = (OD536 - OD568) \times 117.3$. Preliminary results suggest the approximate myoglobin amount per gram in adult Florida Manatee locomotor muscle tissue is 2.60 mg/g. This is much lower than expected, as many terrestrial mammals are known to have much higher myoglobin levels. This may be due to the sessile lifestyle of the Florida manatee. They have no natural predators and live a slow-paced life, resulting in less energy expenditure during diving episodes. Still, it must be noted that manatees can remain underwater for up to 20 minutes. This is about twice the diving capacity of a bottlenose dolphin. These preliminary results suggest other oxygen independent energy producing pathways may be used by these animals to sustain these lengthy dive times. To further verify these results, myoglobin levels will be determined in the swim muscle of a broader range of adult manatees. Additionally, future studies will explore the possible reliance on alternative oxygen independent energy producing mechanisms for extending dive durations of these unique marine animals.

Adverse Childhood Experiences at Gordon State College

Presenters: Shelby Peters and Viondra Payton

Faculty Mentor: Dr. Jessica Traylor

Adverse Childhood Experiences (ACEs) are traumatic events encountered during youth and adolescent years before the age of 18. These events can vary from physical or emotional abuse, neglect, and/or dysfunction within the household which can manifest and lead to multiple risk factors later in life. The goal of the present study was to determine how Gordon State College students from all levels are affected by ACEs, examine the coping strategies most often employed, and raise awareness for resources to cope with traumatic occurrences in a healthy way. Data were drawn from two paper questionnaires. Sixty students completed a cumulative exposure questionnaire to identify and assess the prevalence of ACEs among the student body. Fifty-three students completed an original "yes" or "no" questionnaire to assess students' coping styles as well as to examine the students' perceived level of personal support. Findings indicate that students at GSC experience much higher rates of ACEs than the national average, thus the student population is at a much higher risk for worse health outcomes later in life. Negative coping mechanisms are often employed by students while fewer engage in positive coping mechanisms. An overwhelming majority of students indicated that they have a current personal support system. Although ACEs are very high at GSC, findings show that the student body is on average more open to help and resources. It would benefit the GSC community to conduct further research to determine if there is a gap, whether legitimate or perceived, between students and resources offered by the college and work to establish a plan of action to close this gap if one exists.

Impacts of COVID-19 Pandemic on Gordon State College Students

Presenter: Nicholas Trace Scott

Faculty Mentor: Dr. Cori Newton

Since the year 2020, a global healthcare crisis struck the world in a way that changed every living person's life. Masks, protocols, lockdowns, political unrest, emotional distress, and the loss of so many loved ones were daily news that people of all ages were aware of. Even today, the COVID-19 pandemic is a topic that is discussed every day about new variants and how people can take the appropriate measures to stay safe and healthy. With an event of this magnitude that has impacted every person's life to some degree, this study looks at how the pandemic has affected the lives of the students here at Gordon State College. Data was collected about financial struggles, impacts to degree progression, mental health as well as other affected areas of student lives by conducting an anonymous survey on Gordon State College students. Preliminary results of collected information from the survey have shown a large portion of students have been impacted financially by the pandemic. Other insights from the obtained data indicate that students' mental health and social life have been negatively affected as well. To further validate these results additional surveys will be collected from students. After the collection of the data, the information will be relayed to the institution that these students attend to better accommodate any of the students' needs for them to properly succeed in their collegiate careers.