



ASSUMPTION COLLEGE

Office of the Provost and Vice President for Academic Affairs

Welcome to the 25th *Annual Undergraduate Symposium*. The *Symposium* highlights the research and scholarly achievements of Assumption students working in collaboration with dedicated faculty mentors. These collaborations represent a model for integrating teaching, original research, and the beneficial effects of peer review in promoting intellectual development and professional growth. The *Symposium* provides the campus community with the opportunity to gain a greater appreciation of the individual and collective accomplishments of our faculty and students, as well as to applaud those achievements.

I hope that you enjoy and profit from viewing the posters, hearing the papers, and speaking with the authors of these impressive works.

Sincerely,

Louise Carroll Keeley
Provost and Vice President for Academic Affairs



Undergraduate Symposium Program Schedule

Monday, April 15, 2019

Time	Event	Location
10:00 AM – 11:15 AM	Presentation Session 1	Tsotsis Family Academic Center – Ballroom A
11:30 AM – 1:00 PM	Presentation Session 2	Tsotsis Family Academic Center – Ballroom A
1:30 AM – 2:45 PM	Presentation Session 3	Tsotsis Family Academic Center – Ballroom A

Tuesday, April 16, 2019

Time	Event	Location
8:30 AM – 10:00 AM	Presentation Session 4A	Tsotsis Family Academic Center – Ballroom A
8:30 AM – 9:45 AM	Presentation Session 4B	Tsotsis Family Academic Center – Ballroom B
10:30 AM – 12:00 PM	Presentation Session 5A	Tsotsis Family Academic Center – Ballroom A
10:30 AM – 11:45 AM	Presentation Session 5B	Tsotsis Family Academic Center – Ballroom B
12:30 PM – 2:00 PM	Presentation Session 6A	Tsotsis Family Academic Center – Ballroom A
12:30 PM – 1:45 PM	Presentation Session 6B	Tsotsis Family Academic Center – Ballroom B
2:00 PM – 4:00 PM	Poster Session	Tsotsis Family Academic Center – Ballroom A

**Presentation Session 1
Monday, April 15**

10:00 AM – 11:15 AM Tsotsis Family Academic Center – Ballroom A

Time	Presenter(s)	Discipline	Title
10:00 AM	Travis Butler	NAS	<i>Self-Organization of Cosmic Elements During Stellar Evolution: Comparison Between First and Subsequent Generations of Stars</i>
10:15 AM	Devon Joyce	NAS	<i>Innocent Victims: Exploring Opioid Exposure in Infants</i>
10:30 AM	Alyssa Masciarelli	NAS	<i>Community Service Learning Project at AIDS Project Worcester enriches Immunology Course</i>
10:45 AM	Thomas Barringer	NAS	<i>Seasonal Prevalence of Batrachochytrium dendrobatidis in Central Massachusetts L. catesbeianus Tadpoles</i>
11:00 AM	Cameron Young	NAS	<i>The Role of Interferon-β in the Treatment of Multiple Sclerosis</i>

**Presentation Session 2
Monday, April 15**

11:30 AM – 1:00 PM Tsotsis Family Academic Center – Ballroom A

Time	Presenter(s)	Discipline	Title
11:30 AM	Gabrielle DeLo	ENG	<i>A New Perspective on Female Viking Warriors</i>
11:45 AM	Bryce Thomas	ENG	<i>Medieval Women as Warriors</i>
12:00 PM	Orsolina O’Neill	ENG	<i>Disability in Viking Culture: The Case of Ivar the Boneless</i>
12:15 PM	Jakob Pohlman	PHI	<i>Nodi Virumque Cano: The Man of Twists and Turns</i>
12:30 PM	Michael Turaj	HIS	<i>Norman Thomas: The Fire of a Pacifist</i>
12:45 PM	Zachary Sneeringer	MUS	<i>A Voice That Will Last a Lifetime</i>

**Presentation Session 3
Monday, April 15**

1:30 PM – 2:45 PM Tsotsis Family Academic Center – Ballroom A

Time	Presenter(s)	Discipline	Title
1:30 PM	Maura Geoghegan	EDU	<i>The Factors that Influence the Selection of Literature in a High School English Language Arts (ELA) Curriculum</i>
1:45 PM	Carolina Muñoz	EGS	<i>A Comparative Analysis of Female Labor Force Participation in Latin America</i>
2:00 PM	Emma Salachi	EGS	<i>The Immigration Crisis in Italy A New Crisis Caused by the Convergence of Pre-Existing Crises and What it Means for Globalization</i>
2:15 PM	Daniella Piturzello	SOC & CRM	<i>An Intersectional Analysis of Race, Class, and Gender</i>
2:30 PM	Katie Samalis	POL	<i>An Appeal to Heaven Without Bringing About the Wrath of God: A Thomistic Appeal to Heaven Through Martin Luther King Jr.'s Letter From a Birmingham Jail</i>

**Presentation Session 4A
Tuesday, April 16**

8:30 AM—10:00 AM Tsotsis Family Academic Center – Ballroom A

Time	Presenter(s)	Discipline	Title
8:30 AM	Alexander Richardson	SOC & CRM	<i>Factors for Charitable Giving</i>
8:45 AM	Benjamin Alzamora	SOC & CRM	<i>Dealing with a Child with Intellectual Disabilities</i>
9:00 AM	Justin Hansen	SOC & CRM	<i>Teacher's Beliefs about Behavior Management in Alternative Schools</i>
9:15 AM	Alexandra Youssef	SOC & CRM	<i>Studying Family Connections in Policing</i>
9:30 AM	Taylor Burke	SOC & CRM	<i>Situational Stress on Law Enforcement Officers and Coping Mechanisms</i>
9:45 AM	Alana Caraballo	SOC & CRM	<i>Are Juvenile Detention Centers an Effective or Humane Way of Correcting Criminal Behavior?</i>

**Presentation Session 4B
Tuesday, April 16**

8:30 AM—9:45 AM Tsotsis Family Academic Center – Ballroom B

Time	Presenter(s)	Discipline	Title
8:30 AM	Gabriella Kamyck Antonia Kosnoski Alyssa Szymkowicz	HIS	<i>Conducting Research with the Boston Chronicle, an Eighteenth-Century Newspaper</i>
8:45 AM	Ethan Canova Grant Fabbri Tyler Moreau Colin Orleman	HIS	<i>Marketing The Slave Trade in Eighteenth-Century America</i>
9:00 AM	Alison Fitzpatrick Gina Ledonne Shannon McLaughlin Isabella Ruane	HIS	<i>The Influence of Advertisements in Eighteenth-Century American Newspapers</i>
9:15 AM	Genevieve Duff Jamison Naylor Skylar Wolfe	HIS	<i>Hands-On History: What We Learned from Participating in a History Lab</i>
9:30 AM	Zachary Dubreuil Alex Olmsted Daniel Rodriguez	HIS	<i>Using Advertisements and Shop Signs to Explore Colonial American History</i>

**Presentation Session 5A
Tuesday, April 16**

10:30 AM—12:00 PM Tsotsis Family Academic Center – Ballroom A

Time	Presenter(s)	Discipline	Title
10:30 AM	Joseph Kim	SOC & CRM	<i>Predictors of Police Misconduct</i>
10:45 AM	Robert Vozella	SOC & CRM	<i>Effectiveness of Different Policing Strategies</i>
11:00 AM	Hannah Avard	SOC & CRM	<i>Student Leadership in Faith-Based Programs</i>
11:15 AM	Jake Shetrawski	SOC & CRM	<i>Police Officer and Student Opinions on Body Cameras</i>
11:30 AM	Catherine Mullaney	SOC & CRM	<i>Who Gets Bail?</i>
11:45 AM	Jose Palomino	SOC & CRM	<i>Racial Disparities in the Criminal Justice System</i>

**Presentation Session 5B
Tuesday, April 16**

10:30 AM—11:45 AM Tsotsis Family Academic Center – Ballroom B

Time	Presenter(s)	Discipline	Title
10:30 AM	Samantha Surowiec	HIS	<i>The Importance of Advertisement in the Era of the American Revolution</i>
10:45 AM	Olivia Burke	HIS	<i>When Life Gives You Lemons: Fruit and Status in Colonial and Revolutionary America</i>
11:00 AM	Chloe Amour	HIS	<i>Using Newspaper Advertisement to Examine Consumer Culture in Colonial America</i>
11:15 AM	Matt Ringstaff	HIS	<i>What I Learned as a Guest Curator for the Adverts 250 Project</i>
11:30 AM	Luke DiCicco	HIS	<i>What I Learned From Being a Guest Curator for the Adverts 250 Project</i>

**Presentation Session 6A
Tuesday, April 16**

12:30 PM—2:00 PM Tsotsis Family Academic Center – Ballroom A

Time	Presenter(s)	Discipline	Title
12:30 PM	Allyson Thomas	SOC & CRM	<i>Stress among DCF social workers</i>
12:45 PM	Goran Krasic	SOC & CRM	<i>Police Effectiveness in Preventing Crime</i>
1:00 PM	Eric Van Laarhoven	SOC & CRM	<i>Determinants of Custody in Low-Income Families</i>
1:15 PM	Evan Cristy	SOC & CRM	<i>Factors that Influence Property Crime</i>
1:30 PM	Stephen Lauria	SOC & CRM	<i>Comparison of Attitudes between Police Officers and College Students on Civilians Recording Police-Civilian Interactions</i>
1:45 PM	Meghan Guarino	SOC & CRM	<i>Homelessness: The Effects On Children</i>

Presentation Session 6B
Tuesday, April 16
12:30 PM—1:45 PM Tsotsis Family Academic Center – Ballroom B

Time	Presenter(s)	Discipline	Title
12:30 PM	Aidan Griffin	HIS	<i>Newspaper Advertisements in Colonial America</i>
12:45 PM	Patrick Waters	HIS	<i>Using Advertisement to Examine Daily Life 250 Years Ago Today</i>
1:00 PM	Sean Duda	HIS	<i>Advertisements from 250 Years Ago and What They Tell Us About Life in the Colonies</i>
1:15 PM	Bryant Halpin	HIS	<i>My Experiences as a Guest Curator for Public History Projects about Advertisements</i>
1:30 PM	Zachary Dubreuil	HIS	<i>“Doing” History by Studying Colonial Advertisements</i>

Poster Session
Tuesday, April 16
2:00 PM—4:00 PM Tsotsis Family Academic Center – Ballroom A

Presenter(s)	Discipline	Title
Lauren Andre	NAS	<i>Utilizing Phenotypic Characteristics and Genetic Sequencing to Identify an Unknown Bacterium Isolated from a Paper Towel Dispenser at Assumption College</i>
Sydney Knoll	NAS	<i>The Microbial Community of Kitchen Sponges: Experimental Study Investigating Bacterial Number, Resistance, and Transfer</i>
Annie Collins	NAS	<i>Arsenic in Rice</i>
Samantha Tepper	NAS	<i>The Role of Pigments in DNA Repair and Protection in a Novel Halophilic Archaea</i>
Erin Drumm	NAS	<i>Water Quality in Lake Quinsigamond</i>
Adriana Savage	PSY	<i>Fairness and Inequity in Cooperative Tasks</i>
Aleeza Isaac	NAS	<i>Comparison of Growth Rate and Lipid Content in Desert and Polar Algae</i>
Adrienne Bertothy	NAS	<i>Optimizing the Pulldown of the Exocyst Complex Using α-GFP Nanobodies</i>
Alysha McGovern	PSY	<i>Memory Self-Efficacy and False Memory Susceptibility</i>
William Armstrong	NAS	<i>Examining the Relationship Between mtUPR and Synaptic Remodeling in <i>C. elegans</i></i>
Heather Bates	NAS	<i>In Depth Analysis of Neuronal Dendritic Spines in <i>C. elegans</i></i>
Emily Norman	NAS	<i>Determining Novel Integrin Ligands that Impact Dendritic Spine Formation</i>
Immaculate Ugwumba	NAS	<i>Investigating How Regenerating Axons are Guided to Their Target Cells</i>
Gabrielle Jasmin	PSY	<i>The Impact of Stress on Cognitive Functioning</i>
Meghan Foster Hannah Fung	PSY	<i>Young Adults' Perceptions of Coparenting Dynamics in their Families of Origin</i>
Katelyn Anderson Matthew Fogarty Meghan Sampson	PSY	<i>Symmetry and the Perception of Houses</i>
Isabella Cafaro Alyssa Masciarelli	NAS	<i>Investigating DNA Repair and Protection Mechanisms in the UV-Resistant Haloarchaea, <i>Halobacterium</i></i>
Esperanza Jimenez Hannah Krueger Anthony Mastrocola	PSY	<i>The Role of Priority and Coping in the Relationship Between Optimism/Pessimism and Academic Performance</i>
Christina Forrest Brook Mullen	NAS	<i>Identification of an Unknown Bacterium Isolated from Assumption College's Testa Science Center</i>

ABSTRACTS

Presentation Session 1

Monday, April 15

10:00 AM - 11:15 AM Tsotsis Family Academic Center – Ballroom A

***Self-Organization of Cosmic Elements During Stellar Evolution:
Comparison Between First and Subsequent Generations of Stars***

Travis Butler '20

Natural Sciences

This research project studied the average rates of nucleosynthesis of stars with varying initial metallicity from simulations based on the Stellar Abundances for Galactic Archaeology Stellar Abundances for Galactic Archaeology database. This simulation is of large stars that explode as supernovae and their composition can be compared with the measured ones. The goal was to study the size-complexity relation in stars of varying metallicities and to compare them with other complex systems. As seen in our previous paper, we find that, as for the other systems studied, the complexity of a star, in terms of grouping of its elements, is a power law of its size, despite differing metallicities. The average rate of increase of that complexity also follows a power law of the size of the star even with differences in initial metallicity. Future studies will be aimed at determining how universal the size-complexity relation is, and whether there are any exceptions.

Faculty Mentor: Dr. Georgi Georgiev

Innocent Victims: Exploring Opioid Exposure in Infants

Devon Joyce '19

Natural Sciences

Opioid drugs are a common form of pain management. When a pregnant woman introduces opioids to her body, the drug has the potential to introduce itself into the developing fetus. Prenatal opioid exposure has been linked to several different birth defects in newborns. The physiological mechanisms of opioids were connected to the documented symptoms that have been associated with prenatal opioid exposure. Additionally, potential opioid addiction treatments given to women that are pregnant were explored to determine if they do more help or harm to the fetus. This presentation summarizes an original capstone project that fulfills the final requirement of the Honors Program.

Faculty Mentor: Dr. Aisling Dugan

Community Service Learning Project at AIDS Project Worcester enriches Immunology Course

Alyssa Masciarelli '19

Natural Sciences

Incorporating AIDS Project Worcester as a Community Service Learning (CSL) component to Introductory Immunology (BIO 410) enriched the course's impact on students learning. Students in Immunology visited the AIDS Project Worcester facility and met many employees who shared their own journey with HIV and AIDS. This experience gave students a real-life perspective of the disease and what obstacles HIV positive individuals face daily. As a part of the volunteer program, students participated in two projects. First, students organized a warm clothing donation drive on campus and were able to collect over 100 items during the coldest months of the year. Secondly, students compiled information on local services available to HIV positive, homeless, and at-risk populations to create a resource manual/handout

which was previously unavailable or outdated. The goal was to improve wellness of at-risk individuals in Worcester County by highlighting, compiling, and organizing what services are already available. The CSL component added a unique and dynamic understanding of HIV disease that highlighted not only the biological understanding of the viral disease and its devastating impact of the immune system in the classroom but also underscored the real-life experience of people living with or affected by HIV.

Faculty Mentor: Dr. Aisling Dugan

***Seasonal Prevalence of *Batrachochytrium dendrobatidis* in
Central Massachusetts *L. catesbeianus* Tadpoles***

Thomas Barringer '19

Natural Sciences

Batrachochytrium dendrobatidis (*Bd*) is the etiological agent of chytridiomycosis, a fungal disease that some experts believe will lead to the extinction of nearly half of the amphibian species on this planet. Limited research has been conducted on chytridiomycosis in the Northeast United States, and most of it has primarily focused on examining *Bd* in different species of amphibians. In this study, we examined the presence of *Bd* in one species, *Lithobates catesbeianus* (*L. catesbeianus*), the American Bullfrog, which has natural resistance to the pathogenic effect of *Bd*. Examining different regions of the country, age of *L. catesbeianus*, and season may help scientists determine if environmental factors contribute to the spread of chytridiomycosis. This research project studied the prevalence of *Bd* in American bullfrog tadpoles at three locations in Central Massachusetts and examined if there was seasonal and spatial variation between *Bd* infection in the tadpoles. Tadpoles were swabbed during May and September 2018 at all three locations and the swabs were analyzed using PCR. Out of 136 samples, 33 were positive for *Bd* (24.3%). Twenty-six positive samples were collected during the Spring, and seven were collected in the Fall. Positive samples were found in all three locations. The variation in the density of tadpoles could lead to the significant difference between *Bd* prevalence in the Spring versus the Fall. Seasonal temperatures and the lifecycle of *Bd* could also have played a role in the variation.

Faculty Mentor: Dr. Karolina Fucikova

The Role of Interferon- β in the Treatment of Multiple Sclerosis

Cameron Young '19

Natural Sciences

Multiple sclerosis (MS) is a progressive neurodegenerative disorder that affects 140 out of every 100,000 individuals in North America. MS is believed to be mediated by T cells, in which T cells directly attack or indirectly activate immune cells which attack the myelin sheath of neurons, which can lead to blindness, paralysis, muscle weakness, and walking difficulties. Treatment of MS involves the use of immunomodulatory therapeutics, such as interferon- β (IFN- β), to decrease the progression of demyelination within the CNS. Studies have found that IFN- β increases costimulatory molecules in dendritic cells and monocytes, alters cytokine production in T cells and dendritic cells, and may inhibit the transmigration of immune cells through the blood brain barrier. These results taken together suggest a complex inhibitory system that may reduce the functionality of T cells and dendritic cells, such that T-cells have reduced ability to mediate neuronal attack in cases of MS.

Faculty Mentor: Dr. Laura Marcotte

Presentation Session 2
Monday, April 15
11:30 AM - 1:00 PM Tsotsis Family Academic Center – Ballroom A

A New Perspective on Female Viking Warriors

Gabrielle DeLo '19

English

During their time, the Vikings had a strong oral story telling tradition passed generation to generation. Archeologists have tried to piece together a consistent view of Viking culture from the limited amount of writings and artifacts to which they have access. The character Brynhild is a female shield maiden featured in the *Saga of the Volsungs* and other pieces of Viking literature. The existence of this literature demonstrates that perhaps women had a larger role on the battlefield than previously believed by scholars. Now, in addition to the literary evidence, there has been a recent archeological discovery of a prominent Viking warrior proven to have been genetically female. Reconsidering the literary evidence in light of this archaeological discovery, I will re-evaluate and challenge common, long-held assumptions about the role of female warriors in Viking literature.

Faculty Mentor: Dr. Kristen Carella

Medieval Women as Warriors

Bryce Thomas '20

English Literature

In Medieval studies, there is the question of female roles, and what they were. Were they warriors on the battlefield? Could they have been military leaders, or did they work in the home like the traditional female gender role? Specifically, the character Aslaug is portrayed as a female warrior in *The Saga of Ragnar Lothbrok*, and *The Saga of Ragnar Lothbrok and his Sons Ragnars Saga (and its companion pieces)*. Typically, her role as a warrior has been dismissed in medieval scholarship. Instead, she is seen as a mythological character, rather than a realistic portrayal of women of the time. I will examine this issue, in light of recent research on the grave of a Viking female warrior that was discovered during 1878, then reopened in 2017 in Sweden, and the Vix Princess grave that was unearthed in Burgundy, France in 1953, then reopened in 1991.

Faculty Mentor: Dr. Kristen Carella

Disability in Viking Culture: The Case of Ívar the Boneless

Orsolina O'Neill '20

Elementary Education and English

Throughout history, people with disabilities have often been thought of as 'lesser than' others in their community, or not even fit to live. In my paper, I will be using various primary sources from the Viking Age alongside contemporary research to investigate the portrayal of Ivar the Boneless, a warlord who invaded what is now Northern Britain and Ireland and established a formidable dynasty. Although the Vikings are typically considered to be a ruthless and cutthroat people, the empowerment and respect that were given to Ivar suggest that their view of those with disabilities was perhaps more accepting than any other culture at that time period, at least for the upper-classes. Texts such as *The Saga of Ragnar Lothbrok* suggest that Ívar was valued for his genius in military and political matters, rather than looked down upon for his disability. In this paper, I will show that, at least in the case of Ívar the Boneless, Viking

culture was able to see disabled people as contributing members of society, overlooking their disabilities and utilizing their special abilities.

Faculty Mentor: Dr. Kristen Carella

Nodi Virumque Cano: The Man of Twists and Turns

Jakob Pohlman '22

Philosophy

Mankind is a riddle; he is a Gordian Knot that knows no undoing. Ever since the beginning of the world, man has wondered about himself: his journey of life, the meaning of love, and the definition of goodness. This paper examines the journey of Odysseus, man of twists and turns, and how his journey exemplifies certain elements of human life. It also juxtaposes *The Odyssey* with other great Humanist works, Dante's *Divina Commedia* and various works of Nietzsche. These works together describe the madness of human existence, and ask crucial questions of virtue, God, and τέλος, and whether any of these actually exist. It also spills light on the common human element of Odysseus' journey and how it relates to all of our philosophical experiences.

Faculty Mentor: Dr. Nalin Ranasinghe

Norman Thomas: The Fire of a Pacifist

Michael Turaj '20

History

Norman Thomas, a Presbyterian minister, pacifist, social reformer, co-founder of the American Civil Liberties Union, and six-time presidential candidate for the Socialist Party of America, sparked pacifist beliefs. From his life between 1884 and 1968, Thomas was a vocal opponent of American entry into the two World Wars, Korea and Vietnam. Diving through primary and secondary sources I have uncovered how Thomas's pacifism and political activism illuminated the wider contours of American political history and civil dissent during the first half of the twentieth century.

Faculty Mentor: Dr. Deborah Kisatsky

A Voice That Will Last a Lifetime

Zachary Sneeringer '19

Music

The McClosky Technique™ is a method where one's breathing, posture, and other aspects of their body come into play to form a relaxed state while singing. This method has its basis in the anatomy and physiology of the voice and the vocal process. Even though this method was created for singers, it also has many other applications for everyday voice users. Professional singers use their voices often to sing, but, the majority of time, they use their voices to speak. In a research study done by Dr. Robert T. Sataloff, 75-80% of all vocal problems in singers occur from misuse of the speaking voice, not the singing voice. Singers are the athletes of the vocal world, and if other individuals are able to learn from these athletes and utilize some of the teachings of McClosky, they can make changes to the way they speak and increase the longevity of their own voices.

Faculty Mentor: Prof. Margaret M. Tartaglia

Presentation Session 3

Monday, April 15

11:30 AM - 2:45 PM Tsotsis Family Academic Center – Ballroom A

The Factors that Influence the Selection of Literature in a High School English Language Arts (ELA) Curriculum

Maura Geoghegan '19

Secondary Education

The final week of September is a week dedicated to works of literature that have been banned and challenged. During this week, librarians and educators around the world aim to educate students and citizens about the causes of banned and challenged books. Another way in which to examine these phenomena is to look at the factors that influence high school English teachers' selection of texts that they include in their curricula. The purpose of this research was to examine what factors influence these choices. Public, private, and charter high school English teachers from Massachusetts, Connecticut, and Rhode Island were surveyed. I then asked nine teachers to be interviewed more in-depth, using a semi-structured interview format. Results from both surveys and interviews suggest that these teachers think that they have autonomy to select literary texts. Literary merit, fostering lifelong readers, and including more multicultural texts emerged as the three factors that most influenced these teachers. The thoughts and feelings of students had the largest influence on literature selection while the thoughts and feelings of parents, community, and administration had surprisingly little influence on literature selection.

Faculty Mentor: Dr. Cathy Stutz

A Comparative Analysis of Female Labor Force Participation in Latin America

Carolina Muñoz '19

Economics

The research in this paper intends to analyze the effects that the Female Labor Force Participation (LFP) has had on the development of Latin American countries. My hypothesis proposes that increasing female labor participation leads to higher labor input, which will enable economic growth. The dependent variable is Female LFP and the independent variables include: the types of employment, education levels, total fertility rates, unemployment rates, GDP per capita, and GDP growth. An econometrics regression analysis will be used to test the hypothesis.

Faculty Mentor: Prof. Smriti Rao

The Immigration Crisis in Italy

A New Crisis Caused by the Convergence of Pre-Existing Crises and What it Means for Globalization

Emma Salachi '19

Global Studies

In 2014, waves of immigrants and asylum-seekers began to pour into Italy via the Mediterranean Sea, and in 2015 this situation was named the European "immigration crisis." However, this increase in immigration is not a crisis in and of itself. Rather, it provided the stimuli needed to create a crisis from the pre-existing problems in the European Union, and, specifically, the country of Italy. These problems include the country's poor economy, the European Central Bank's failure to help Italy in the economic crisis of 2008, the flaws in European Union immigration policy, the unstable government, and a history of anti-immigrant sentiment. The problems in the actions of the European Union and the European Central

Bank to assist Italy in managing its many challenges both before and during the immigration crisis introduces the problem of globalization in the case of the EU, and begs the question: Does globalization help or hurt countries?

Faculty Mentor: Prof. Smriti Rao

An Intersectional Analysis of Race, Class, and Gender

Daniella Pitruzzello '19

Sociology

An analysis that adopts a traditional research approach in examining the government housing market and addresses the current problems that exist within it. It considers the problems that individual renters encounter including stereotypes from surrounding communities and inability to become independent of the program. The research additionally suggests potential solutions proposed by experts that could benefit those utilizing the program. In order to account for all affected groups, the analysis considers an intersectional perspective analyzing the race, class, and gender of its residents. It specifically focuses on poor, African American, single mothers who are some of the largest recipients of the program.

Faculty Mentor: Dr. Steven Farough

An Appeal to Heaven without Bringing about the Wrath of God: A Thomistic Appeal to Heaven through Martin Luther King Jr.'s Letter from a Birmingham Jail

Katie Samalis '19

Political Science

Only the most tyrannical regimes violate most, if not all, natural rights. Both St. Thomas Aquinas and John Locke agree that tyrannicide is an appropriate response to these actions. However, what if the actions of the government are short of tyranny? This is the problem that Martin Luther King Jr. and his non-violent movement faced when trying to combat the segregation laws of the south. King's argument somewhat misconstrues the writings of Aquinas, but might still gain the angelic doctor's approval. Martin Luther King Jr.'s non-violent movement was far more than an act of civil disobedience. By combining the writings and thoughts of King, Aquinas, and Locke can create the conditions necessary to selectively appeal to the regime about laws that are damaging to the common good and in conflict with the foundations of the regime, without the need to rebel against the whole. This presentation summarizes collaborative research conducted with a faculty member made possible by an Honors Summer Fellowship.

Faculty Mentor: Dr. Geoffrey Vaughan

Presentation Session 4A
Tuesday, April 16
8:30 AM - 10:00 AM Tsotsis Family Academic Center – Ballroom A

Factors for Charitable Giving

Alex Richardson '19
Criminology

Understanding what predicts people's charitable giving can play a vital role for the amount of money a non-profit agency can raise. Ten employees from several non-profit agencies were interviewed for this study. Their positions range from a CEO, development staff and programs staff. Interview questions ranged from how they got into their positions and what charitable giving success or failures have they experienced. The analyses on the types of procedures or policies non-profits utilize shows how much of a factor knowing the target population can be. Having a better understanding of the communities an agency targets for donations can be the deciding factor for whether or not someone is willing to donate. Understanding tax write-offs can be an important factor for why large successful companies and people donate more to different non-profit agencies.

Faculty Mentor: Dr. Alison Cares

Dealing with a Child with Intellectual Disabilities

Ben Alzamora '19
Criminology

Dealing with a child or family member with an intellectual disability can be an overwhelming task. People with intellectual disabilities can be very challenging to care for and often put a strain on their parents and family members. Society needs to do all it can to assist those with intellectual disabilities and their families. The problem therefore is how to best use our resources to help the families of people with intellectual disabilities. Family members of people with intellectual disabilities were surveyed to discover what they felt were their biggest issues and how society can best work to assist them. Survey responses will be used to better inform the public on the issues a family with a child with intellectual disabilities faces.

Faculty Member: Dr. Alison Cares

Teacher's Beliefs about Behavior Management in Alternative Schools

Justin Hansen '19
Criminology

Factors such as age, race, gender, and social class can have an effect on the way teachers view and implement behavior strategies in alternative schools. Participants completed a 20-30 minute interview with guided questions to get an idea of their opinions and implementation styles of behavior management. This allows for better insight into the everyday behavior strategies used within the classroom. The data suggests that it is possible that certain factors may contribute to the way in which teachers formulate and enforce behavior strategies. This could help us find the best way to help children succeed while enforcing good behavior at school.

Faculty Mentor: Dr. Alison Cares

Studying Family Connections in Policing

Alexandra Youssef '19

Criminology

This study investigates how family background plays a role in the police workforce, and its benefits are important in two ways. First, it may serve as a motivating factor in selecting into policing as a career field, whether as a law enforcement officer or a civilian working in a police department. Second, it may be helpful because those who grew up with family members in law enforcement may have a better understanding of the nature of the work and how to cope with it. Participants in the study were officers at a local police department. Each participant partook in 25-30 minute interviews regarding family background and aspirations before joining the field. The data collected during these interviews showed that there was some type of family background or influence that ended up playing a part in their future career choices.

Faculty Mentor: Dr. Alison Cares

Situational Stress on Law Enforcement Officers and Coping Mechanisms

Taylor Burke '19

Criminology

Having a career in law enforcement guarantees officers will come in contact with stressful situations, but some situations cause more stress than others. Coping mechanisms vary depending on the individual and situations they face. Knowing what triggers more stress and causes the most harm to officers can help aid their coping strategies. Research participants consisted of 7-10 officers in a small town located in Worcester County. Officers were male, ranging in age and time on the force. Officers participated in interviews asking about home life, stressful work situations, and coping mechanisms. Interviews lasted less than 20 minutes. Stress levels varied depending on marriage, children, and home-life status.

Faculty Mentor: Dr. Alison Cares

Are Juvenile Detention Centers an Effective or Humane Way of Correcting Criminal Behavior?

Alana Caraballo '19

Criminology

This study is based on interviews with staff who work with at risk youth regarding juvenile detention centers. The purpose of the study is to understand the beliefs and attitudes toward juvenile detention centers among those who work with this group. Five individuals were interviewed for 25 to 30 minutes each. The interviews were conducted on one-on-one in person in a private rooms and were also recorded on a mobile phone.

Faculty Mentor: Dr. Alison Cares

Presentation Session 4B
Tuesday, April 16
8:30 AM - 9:45 AM Tsotsis Family Academic Center – Ballroom B

Conducting Research with the Boston Chronicle, an Eighteenth-Century Newspaper

Gabriella Kamyck '22, Antonia Kosnoski '22, and Alyssa Szymkowicz '19

History

This presentation showcases our team's experience working on a project to identify shop signs in colonial Boston. We utilized multiple primary sources to gather information. We used the Early American Newspapers database to examine digitized copies of the *Boston Chronicle* from 1769. We created a digital archive of eighteenth-century newspapers, compiled a list of shop signs that appeared in the advertisements, and plotted their locations on a map of colonial Boston. This not only expanded our knowledge of early America, but also strengthened our abilities to conduct historical research. By using primary sources and modern technology as research tools, we saw eighteenth-century Boston illuminated before our eyes. In the process, we learned that when conducting historical research we must keep in mind that we might not always have all of the pieces of information to the puzzle we are trying to fit together.

Faculty Mentor: Dr. Carl Robert Keyes

Marketing The Slave Trade in Eighteenth-Century America

Ethan Canova '22, Grant Fabbri '22, Tyler Moreau '22, and Colin Orleman '22

History

We will be examining advertisements about enslaved men, women, and children from newspapers published in eighteenth-century America. In particular, we will discuss how they show the variety of jobs slaves had, the various skills possessed by enslaved people, the process of hiring out slaves, and the impact enslaved people had on the economy in early America. We will tie this to work we conducted as part of a History Lab on shop signs in colonial newspapers. We will compare the advertisements about enslaved people to other advertisements to gain a sense of the complexity of the colonial marketplace, the role of slaves in the economy, and how the lives of enslaved men and woman in cities differed from those in the countryside.

Faculty Mentor: Dr. Carl Robert Keyes

The Influence of Advertisements in Eighteenth-Century American Newspapers

Alison Fitzpatrick '22, Gina LeDonne '22, Shannon McLaughlin '22, and Isabella Ruane '22

History

This presentation showcases our experience with working and collaborating on a History Lab focused on advertisements from colonial and revolutionary America. We examined advertisements from eighteenth-century newspapers via the Early American Newspapers database and the *Adverts 250 Project*. We saw how colonists shared and received information. Advertisements in eighteenth-century newspapers sought to attract buyers for goods, like food, tea, housewares, and fabric for clothes. Additionally, these advertisements promoted the buying and selling of enslaved people. From analyzing these newspapers, we were able to better understand American society during that era. Our work allows others to understand and recognize the importance and role these advertisements had in constructing the social, economic and political culture in early America.

Faculty Mentor: Dr. Carl Robert Keyes

Hands-On History: What We Learned from Participating in a History Lab

Genevieve Duff '22, Jamison Naylor '22, and Skylar Wolfe '22

History

This presentation features our team's experiences working on a History Lab designed to identify shop signs listed in colonial American newspaper advertisements. The end goal of this project was to create a roster of shop signs that were used during the time period, and use this roster to locate the shops on a map of colonial Boston on the eve of the American Revolution. Our group focused on looking for shop signs in the *Boston Evening-Post*. In this presentation we will discuss the steps we took while completing this project. We also will discuss the struggles and frustrations that we encountered during this project. Finally, we will discuss what we learned about life in eighteenth-century American and the significance of this research.

Faculty Mentor: Dr. Carl Robert Keyes

Using Advertisements and Shop Signs to Explore Colonial American History

Zachary Dubreuil '21, Alexander Olmsted '22, and Daniel Rodriguez '22

History

This presentation features my team's work in identifying shops signs in Boston in the era of the American Revolution. We looked at the Boston Post-Boy from 1769 via the Early American Newspapers databases to determine the various names and locations of shop signs as well as the frequency the shop signs appeared. Colonists used the shop signs to locate where places were so they could purchase goods and services. These shops signs also give us a look into what Revolutionary Boston looked like and allowed us to map out where the shops were positioned. Along with the shops signs we had also looked at advertisements about enslaved men, women and, children. Each one of these advertisements tells a story about enslaved people, including if they had specific skills. Our research can help other people better understand what Revolutionary Boston was like and why shop signs and advertisement were useful.

Faculty Mentor: Dr. Carl Robert Keyes

Presentation Session 5A

Tuesday, April 16

10:30 AM - 12:00 PM Tsotsis Family Academic Center – Ballroom A

Predictors of Police Misconduct

Joseph Kim '19

Criminology

There are certain factors that are predictors of crimes committed by law enforcement officers. Using secondary data analysis and cross examining data sets, we are able to see the correlation between certain factors, such as the rate at which there is police misconduct. Using the Henry A. Wallace Police Crime Database, we are able to see the number of cases of police misconduct broken down by county. Using that data and comparing that data with factors such as population, salary, violent crime rate, among others, we can see the correlation between this data and police misconduct. By doing so, we are able to see if certain factors are predictors of crimes by law enforcement.

Faculty Mentor: Dr. Alison Cares

Effectiveness of Different Policing Strategies

Robert Vozella '19

Criminology

This research project focuses on the most effective policing strategies within police departments. For this study I use about thirty surveys, one for each officer in the department. The questions on the survey have to do with different types of policing strategies used within the department. The end result of this study is to come to a conclusion about which types of policing strategies work in order to help the department realize which they should prioritize. I will be looking at policing strategies such as stop-and-frisk and problem-oriented policing.

Faculty Mentor: Dr. Alison Cares

Student Leadership in Faith-Based Programs

Hannah Avard '19

Criminology

Through the years, there has been a level of importance placed on student leadership as it relates to development and achievement. Research has found a strong correlation between students who engage in leadership and their subsequent accomplishments. Due to the rise of enrollment in religious institutions, it is important to understand how these findings relate to campus ministry programs and student religiosity. By conducting 10 interviews regarding students' and campus ministers' roles in campus ministry and the development of their faith during the time of their involvement, I hope to ascertain if there is a relationship between student leadership and the development of spirituality. Interviews will include questions regarding the participants' faith life and how they have seen their faith change during the time they hold a position of leadership. This research will be beneficial in constricting and refiguring campus ministry programs.

Faculty Mentor: Dr. Alison Cares

Police Officer and Student Opinions on Body Cameras

Jake Shetrawski '19

Criminology

Police brutality has become a high-profile issue in today's society. Well-publicized incidents, like the killing of Michael Brown, have caused tension and distrust between many citizens and police officers. This study analyzes the opinions and effectiveness on police-worn body cameras by both college-aged students and police officers. With the results of this study, we can evaluate the reactions of both sides and try to better policing and the opinions of officers in today's society.

Faculty Mentor: Dr. Alison Cares

Who Gets Bail?

Catherine Mullaney '19

Criminology

Massachusetts law was reformed as of 2019 so that bail is set in an amount no higher than what will assure the appearance of a person before the court while taking into consideration the defendant's financial resources. This study utilized a sample of thirty individuals observed in a public courtroom at the Worcester District Court. This research examined the brief interactions among the judges, attorneys, and defendants within the courtroom as well as whether or not this provision is effective in setting bail. I hypothesized that while an individual's prior criminal record and the severity of their offense would

influence decision made during bail hearings that inherent biases against race, age, and gender would also continue appear throughout the bail hearing process.

Faculty Members: Dr. Alison Cares

Racial Disparities in the Criminal Justice System

Jose Palomino '19

Criminology

Juveniles in the criminal justice system are treated differently based on their race and ethnicity. This study examines differences in case outcomes, such as arrest, arraignment, probation, detention, and commitment, for juveniles by race in all twelve counties in Massachusetts. The data is publicly available through the Juvenile Detention Alternatives Initiative and their interactive map. The races/ethnicities examined include White, Black, Hispanic, and Asian.

Faculty Members: Dr. Alison Cares

Presentation Session 5B

Tuesday, April 16

10:30 AM - 11:45 AM Tsotsis Family Academic Center – Ballroom B

The Importance of Advertisement in the Era of the American Revolution

Samantha Surowiec '21

History

When most people think of the beginnings of the American Revolution, they picture the Continental Congress drafting the Declaration of Independence, angry colonists protesting in the streets, and tea being thrown into Boston harbor. However, there is another aspect of the Revolution that is less emphasized, but no less important: colonial print culture. The *Adverts 250 Project* brings to light how much of an influence newspapers had by examining the various advertisements placed in them. Some show what types of goods were available for colonists to purchase or told them what to boycott in support of the Revolution; other advertisements were printed for the purpose of buying and selling slaves or catching runaways. Each advertisement conveys a different aspect of colonial America and served as a mode of communication between colonists, allowing not just material goods to spread through different colonies, but also ideas that helped foster a revolutionary spirit.

Faculty Mentor: Dr. Carl Robert Keyes

When Life Gives You Lemons: Fruit and Status in Colonial and Revolutionary America

Olivia Burke '20

History

In the eighteenth century, consumer goods increased in importance throughout the Atlantic world. There was a shift from self-sustainability toward wanting to buy and possess material goods. Wealthier colonists used these items, whether food, furniture, or clothes, to show status. One way to observe this consumer revolution is by analyzing advertisements printed in newspapers in eighteenth-century America. As a guest curator for the *Adverts 250 Project* I did just that. I gained insight into consumer culture in the American colonies in the years leading up to the American Revolution. While studying early American newspapers an advertisement for lemons caught my eye. Fresh fruit was a rare and expensive commodity to acquire in the eighteenth century and was largely only available for the

wealthy. I will examine an advertisement for lemons from March 9, 1769, as an example of the importance and prevalence of the rising consumer culture in colonial America and also how items could show social status.

Faculty Mentor: Dr. Carl Robert Keyes

Using Newspaper Advertisement to Examine Consumer Culture in Colonial America

Chloe Amour '21

History

The *Adverts 250 Project* sheds light onto the colonial and revolutionary lifestyle and sought-after goods from 250 years ago. Serving as a guest curator, I examined many advertisements promoting goods and services that closely replicated British culture. Whether it was for sugar, hairstyling services, or even watches, colonists saw importance in such things. Contrary to popular belief, the colonies did not initially want full independence from the British crown. In fact, 250 years ago the colonists were still heavily influenced and viewed themselves as British. This speaks volumes about their lifestyle. Applying historical analysis to the newspaper advertisements allowed for this underlying message to come to light. In addition to strong British ties, certain consumer goods represented social status.

Faculty Mentor: Dr. Carl Robert Keyes

What I Learned as a Guest Curator for the Adverts 250 Project

Matthew Ringstaff '21

History

The *Adverts 250 Project* gives students a chance to see what it's like to be an historian, searching through archives, reading eighteenth-century newspapers, research trips to the American Antiquarian Society, and working with a group of peers. The overall experience is just a good time. The project demands hard work in and out of class, spending hours at night reading through newspapers like the *Newport Mercury*, sometimes squinting and trying to read through the dark patches. Yet this work was not like what I have done in any other class. It may not be like any other history class I will ever take. By working as a guest curator for the *Adverts 250 Project* I really experienced history in an entirely new way.

Faculty Mentor: Dr. Carl Robert Keyes

What I Learned From Being a Guest Curator for the Adverts 250 Project

Luke DiCicco '21

History

The *Adverts 250 Project* examines American history through a different scope than many other historical projects. I never realized how important print culture was to the colonists but I learned that newspaper advertisements were very influential to colonial and revolutionary lifestyles. Advertisements were used for a number of different purposes. Some of these included the selling of imported goods to the public while others were more focused on slaves, whether they were being bought and sold or wanted the return of runaway slaves. These advertisements help us achieve a better understanding of what the lives of colonists were really like in the 1760s. Serving as a guest curator provided me with the opportunity to research all of this, almost putting me in the shoes of a colonist to see everyday life from the period.

Faculty Mentor: Dr. Carl Robert Keyes

Presentation Session 6A
Tuesday, April 16
12:30 PM - 2:00 PM Tsotsis Family Academic Center – Ballroom A

Stress among DCF social workers

Allyson Thomas '19

Criminology

Child and family social workers help children and families work toward resolving personal problems as well as family-related problems. They deal with struggling parents on a daily basis. There are individual characteristics and organizational factors that are linked with job stress, turnover, and burnout in this profession. The purpose of this study is to examine the predictors of stress and burnout that many social workers that work with children and families face and how they impact work turnover. The sample consists of social workers at the DCF in the Worcester-region of Massachusetts. An online survey was administered to workers via email. Their responses looked at personal and environmental factors that may have contributed to their stress.

Faculty Mentor: Dr. Alison Cares

Police Effectiveness in Preventing Crime

Goran Krasic '19

Criminology

This study examines the effectiveness of every day police tactics in deterring crime. Many studies, such as The National Criminal Justice Reference, have findings that support some tactics, such as increased patrols and proactive arrests of serious repeat offenders, while others, such as community policing, are not effective. Participants were interviewed from both Worcester Police Department as well as Assumption Police Department to find what is effective and what is not. By interviewing police officers from different departments, different results were found.

Faculty Mentor: Dr. Alison Cares

Determinants of Custody in Low-Income Families

Eric Van Laarhoven '19

Criminology

This study is based on participant observation of custody hearings taking place in the probate and family department within a Massachusetts County Courthouse. The purpose of the observation was to establish the factors that judges take into consideration when deciding which parents get favorable custody orders. These court cases were all public cases taking place within the probate and family department. There were nine participant observation sessions, and each judge was observed three times each. Findings were based on open coding of field notes as well as watching for traditional gender norms that might contribute to the judge's ruling.

Faculty Mentor: Dr. Alison Cares

Factors that Influence Property Crime

Evan Cristy '19

Criminology

The research conducted in this study analyzes what factors influence increases in property crime rates in certain cities/towns, including annual household incomes and the number of retail establishments within a town. The study will analyze secondary data derived from UCR crime reports, the U.S. Census, annual town reports, and the business section of the census bureau in order to gain accurate information on factors influencing property crime. Once these statistics are obtained, the rates of property crime will be analyzed in accordance with the annual household incomes and number of retailers within the area in order to determine what factors contribute to higher or lower rates of property crime within the thirty towns/cities that are going to be analyzed within the study.

Faculty Mentor: Dr. Alison Cares

Comparison of Attitudes between Police Officers and College Students on Civilians Recording Police-Civilian Interactions

Stephen Lauria '19

Criminology

Cell phone recording of police-civilian interactions is becoming more and more common. I will be interviewing people from a police department in order to ask them their opinions on how such recording feels when it is happening. I will also be interviewing students from Assumption College by asking them about their views on the practice of recording police officers with cell phones. I will then compare the two different groups' answers. With these interviews we are able to see how two different groups and lifestyles feel about this certain topic.

Faculty Mentor: Dr. Alison Cares

Homelessness: The Effects On Children

Meghan Guarino '19

Criminology

As of January 2017, there were 553,742 people in the United States experiencing homelessness. One in thirty of those people are children. Homelessness can vary from individuals living on the streets with no type of shelter to individuals residing in shelters specifically for people who suffer from homelessness. Participants completed a 30-60 minute interview that explored the day-to-day as a professional working with children that suffer from homelessness. Throughout the interviews, there was information gained about the importance of play and social interaction for the development of a young child.

Faculty Mentor: Dr. Alison Cares

Presentation Session 6B
Tuesday, April 16
12:30 PM – 1:45PM Tsotsis Family Academic Center – Ballroom B

Newspaper Advertisements in Colonial America

Aidan Griffin '20

History

The *Adverts 250 Project* presents products advertised in eighteenth-century America, allowing us to see changes in consumer culture. By studying history this way, we also learn about the economics and politics of the time. This project allowed me to look back in time to see the advertising and print culture that existed at the time of the American Revolution. As a guest curator for a week during the Spring 2019 semester I gained a better understanding of American history and culture from that period.

Faculty Mentor: Dr. Carl Robert Keyes

Using Advertisement to Examine Daily Life 250 Years Ago Today

Patrick Waters '19

History

In today's age it is easy to be frustrated with the amount of data from advertisers that we are subjected to on a daily basis while trying to surf the web, watch television, or simply listen to music. However, that is a luxury for business today that was unimaginable 250 years ago. During the Spring 2019 semester I worked as a guest curator for the *Adverts 250 Project*, examining how advertisers marketed their products or services to their communities. The advertisements provide a look into the past, allowing us to better understand what was important to colonial consumers. The newspaper was the most important marketing medium. Newspapers from colonial and revolutionary America featured advertisements ranging from ships trying to offload their cargoes of enslaved men, women, and children to dancing masters advertising lessons.

Faculty Mentor: Dr. Carl Robert Keyes

Advertisements from 250 Years Ago and What They Tell Us About Life in the Colonies

Sean Duda '21

History

Today, many Americans create a common identity through consumer culture and the advertisements that annoy them as they watch their televisions. Something similar could be said for people in the colonies 250 years ago in regards. When it came to identifying important cultural customs and practices, the major difference when examining advertisements for consumer goods then and now is that advertisements were in newspapers in the eighteenth century instead of on screens. Consumer culture in the colonies involved the process of "Anglicization" which created a common language that everyone understood when it came to buying things and talking about their meaning. This presentation examines advertisements from 250 years ago to demonstrate their intended effects on the populations that they targeted.

Faculty Mentor: Dr. Carl Robert Keyes

My Experiences as a Guest Curator for Public History Projects about Advertisements

Bryant Halpin '21

History

The *Adverts 250 Project* examines what people were doing 250 years ago. The project studies advertisements from colonial and revolutionary newspapers to learn what kind of consumer goods were being sold. The *Slavery Adverts 250 Project* focuses on advertisement for enslaved men, women, and children. As a guest curator for both projects for a week during the Spring 2019 semester, I examined both kinds of advertisement. This involved understanding the advertisements themselves as well as what was happening socially, economically, and politically during the eighteenth century. The projects provided an opportunity to expand my knowledge of early American history, further develop my research skills, and understand what historians do on a daily basis.

Faculty Mentor: Dr. Carl Robert Keyes

“Doing” History by Studying Colonial Advertisements

Zachary Dubreuil '21

History

This presentation features my work on the *Adverts 250 Project* and the *Slavery Adverts Project*. The *Adverts 250 Project* allowed for me to understand how people lived in colonial and revolutionary America and also what consumer culture was like during the eighteenth century. Colonists used the advertisements to reach out to potential buyers to let them know what they had in their inventory. The advertisements show how people lived and what major items were popular in the colonies. The *Slavery Adverts 250 Project* investigates the lives of enslaved people. These advertisements encompass a vast amount of history about the lives of colonists just before the American Revolution began. Researching these advertisements helped me to “do” history myself instead of just learning about the past from others.

Faculty Mentor: Dr. Carl Robert Keyes

Poster Session
Tuesday, April 16
2:00 PM - 4:00 PM Tsotsis Family Academic Center – Ballroom A

Utilizing Phenotypic Characteristics and Genetic Sequencing to Identify an Unknown Bacterium Isolated from a Paper Towel Dispenser at Assumption College

Lauren Andre '20
Natural Sciences

Since the world of bacteria is immensely diverse and bacteria occupy a variety of habitats, it is critical to be able to identify these microorganisms and understand their role in the environment. The purpose of this study was to define the phenotypic characteristics and sequence the 16S rRNA gene of an unknown bacterium isolated from a bathroom paper towel dispenser at Assumption College using a variety of assays and bioinformatics. Using a wide range of chemically defined media, reagents, and stains, many morphological and metabolic characteristics about the unknown bacterium can be defined. It was concluded that the unknown bacterium's morphology consisted of coccus-shaped, tetrad-clustered cells that formed circular, yellow colonies that prefer to grow in an oxygenated environment at 37°C at a pH of 9.0. The non-motile unknown bacterium was observed to be gram-positive and non-endospore-forming. As a result of metabolic assays, the unknown bacterium, tolerant to mannitol salt, presented activity for nitrate reductase, catalase, and citrase enzymes. The bacterium was successful in its ability to ferment lactose, sucrose, and glucose into acetoin. The results of this study provide new insight into the importance of microbes and how they influence our everyday lives.

Faculty Mentor: Dr. Aisling Dugan

The Microbial Community of Kitchen Sponges: Experimental Study Investigating Bacterial Number, Resistance, and Transfer

Sydney Knoll '19
Natural Sciences

In the United States alone, there are over 9.4 million incidents of foodborne illnesses each year. We hypothesized that the moist, porous nature of kitchen sponges not only provides microbes the perfect habitat to grow, but it also serves as a vehicle that may allow potential pathogens to move from place to place, potentially being an agent in foodborne illnesses. The goal of this study was to quantify the bacterial number in household kitchen sponges, test the effectiveness of household cleaners, and to investigate the potential bacterial transfer capability of kitchen sponges. To do this, five sponges were distributed to participants and the bacterial abundance was quantified every 7 days for a total of 28 days. The data showed bacterial contamination in sponges as high as 1×10^9 CFU/cm³, that chemical methods reduced contaminated sponges by 99.9%, and that an average of 4.87% bacteria can transfer from sponge to surface. This presentation summarizes an original capstone project that fulfills the final requirement of the Honors Program.

Faculty Mentor: Dr. Aisling Dugan

Arsenic in Rice

Annie Collins '19

Natural Sciences

Oryza Sativa, also known as rice, can absorb inorganic compounds from water such as arsenic. There have been many efforts to reduce arsenic in contaminated groundwater such as using sand and iron oxide. The goal of this experiment was to determine if cooking rice in the presence of iron oxide reduces the amount of arsenic in rice. Using the Graphite Furnace Atomic Absorbance, volumes of 100 mL enriched long grain white rice samples were cooked approximately with 1 g of iron oxide and analyzed for both iron and arsenic concentrations. It was found that there was no difference in arsenic concentrations found within rice and further experiments have been conducted to determine whether cooking with iron prevents further absorbance of arsenic by the rice.

Faculty Mentor: Dr. Brian Niece

The Role of Pigments in DNA Repair and Protection in a Novel Halophilic Archaea

Samantha Tepper '20

Natural Sciences

Most halophilic archaea are highly UV resistant organisms that live in extreme environments of high salt concentration such as salt lakes and salt flats. However, the *Natrinema* strain 6-1 doesn't follow this pattern. In general, *Natrinema* species are rod-shaped cells about 1-5Mm in size. When cultured onto a plate, their colonies are usually smooth, round, and found to have an orange-red color. Most contain carotenoid pigments which give them a reddish appearance. The main focus of this experiment will be to examine the growth of 6-1 *Natrinema* and to complete survival curves. A 6-1 mutant characterization was generated in order to produce a 6-1 white mutant. A white mutant will be obtained in future experiments by performing screenings. Once this has been accomplished, the 6-1 wild type and 6-1 white mutant will be compared using survival curves. The data collected will help to determine if pigmentation has a role in UV protection or DNA repair. We predict that the white mutants will have similar survival to the pigmented strains.

Faculty Mentor: Dr. David Crowley

Water Quality in Lake Quinsigamond

Erin Drumm '21

Natural Sciences

Poor water quality has a negative impact on the health of an ecosystem and can have detrimental effects on the organisms that inhabit it. In order to assess the water quality of Lake Quinsigamond, water quality data was obtained from the city of Worcester Public Works and Parks Department. The data was then manipulated and organized in order to analyze the relationships between different water quality parameters. Data and reports from multiple years were utilized, however, this study mainly focused on the water quality data obtained in 2017 and 2018.

Faculty Mentor: Dr. James Hauri

Fairness and Inequity in Cooperative Tasks

Adriana Savage '20

Psychology

We examined the role of previous experience (a helpful or unhelpful partner) on cooperative behavior during a game task. In Phase 1, the participant could win the game based on the other player's behavior, and whether the other player allowed the participant to win varied across groups. In Phase 2, the participant had the opportunity to allow the other player to win. Results showed an aversion to inequity: In Phase 1, the participants did not allow themselves to win. However, Phase 2 results showed that aversion to inequity was influenced how helpful the partner was to the participant in Phase 1.

Faculty Mentor: Dr. Karen Lionello-Denolf

Comparison of Growth Rate and Lipid Content in Desert and Polar Algae

Aleeza Isaac '20

Natural Sciences

Thanks to their ability to produce lipids and carbohydrates, microscopic algae are a potential source of renewable fuels. Determining what conditions are most favorable to the growth and lipid production of specific algal strains can aid in the search for an alternative to fossil fuels. Desert and polar strains of *Bracteacoccus bullatus* were grown on different media and tracked for their growth rates over one month. In another experiment, the same strains were frozen for two hours, grown for several weeks, and subsequently harvested. The cellular lipids were chemically extracted and analyzed using a GC/MS. The results suggested that the polar strains grew best in nutrient-enriched media while the desert strains grew best in the nutrient-poor media. In response to freezing, total lipid content increased in the desert strains and decreased in the polar strains. This suggests major physiological differences between the desert and polar strains of the same species.

Faculty Mentor: Dr. Karolina Fucikova

Optimizing the Pulldown of the Exocyst Complex Using α -GFP Nanobodies

Adrienne Bertothy '19

Natural Sciences

The exocyst is an octameric protein complex that is involved in various cell trafficking pathways. Although the structure of the exocyst has been determined for the budding yeast *S. cerevisiae*, there are gaps in knowledge about the exocyst in other organisms. This research aimed to uncover the assembly and structure of the exocyst in *S. pombe*, a species of fission yeast. First, the protocol for purifying GFP-tagged exocysts from *S. cerevisiae* using magnetic nanobodies was optimized. Then, the same protocol was applied to *S. pombe*, and a western blot was used to confirm the presence of exocyst subunits. It is unclear which subunits result from the affinity purification with *S. pombe*, so additional analysis is needed. The final goal would be to visualize the *S. pombe* exocyst using electron microscopy, since structure gives insight into function and mechanism of action.

Faculty Mentor: Dr. Laura Marcotte

Memory Self-Efficacy and False Memory Susceptibility

Alysha McGovern '19

Psychology

The relationship between memory self-efficacy (MSE) and actual memory performance has been well-studied without much consensus (Beaudoin & Desrichard, 2011 for review). Few studies have attempted to experimentally manipulate MSE prior to assessing memory performance, particularly in an

applied eyewitness memory context (but see Bogart, 2017; Szpitalak & Polczyk, 2015). In the present study, we examined whether completing a task believed to enhance memory capabilities (the MSE manipulation) would improve memory for a witnessed event and reduce susceptibility to misleading post-event information. The results indicate that manipulating MSE reduced susceptibility to misinformation, particularly when it was introduced prior to encoding.

Faculty Mentor: Dr. Leamarie Gordon

Examining the Relationship Between mtUPR and Synaptic Remodeling in C. elegans

William Armstrong '20

Natural Sciences

Synaptic remodeling in the nervous system occurs throughout development. Using *C. elegans*, the relationship between stress and remodeling was studied. The mitochondrial unfolded protein response, mtUPR, is a stress response from misfolded proteins in the mitochondria. Worms with mutations in mtUPR were studied to see if they also had defects in remodeling. Only mutants of *dve-1* had remodeling defects. Worms with remodeling mutations were then tested to examine differences in mtUPR. RNAi was used to knock out *cco-1* in the electron transport chain of the mitochondria, inducing stress. By measuring the fluorescence of GFP tagged hsp-6 activated by mtUPR, stress response could be quantified. The results showed worms with remodeling mutations had higher base levels of stress than worms without these mutations. This suggests that, although the remodeling process may not be affected by mtUPR, *dve-1* may play a novel role in synaptic remodeling, and these mutations may cause mtUPR overexpression.

Faculty Mentor: Dr. Michele Lemons

In Depth Analysis of Neuronal Dendritic Spines in C. elegans

Heather Bates '20

Natural Sciences

The nervous system is made up of specialized cells called neurons, which are able to communicate with each other at a region called the synapse. Synapses have signal-receiving sites (dendrites) and signal-sending sites (axon terminals). Spine-like protrusions (SLPs) extend from the main dendritic shaft in our model system, *Caenorhabditis elegans*. However, the molecular mechanisms that drive development of these SLPs are not well understood. This work aimed to identify novel genes necessary for formation of these dendritic spines. Previous studies have also confirmed that transmembrane proteins called integrins play a role at the synapse. This research intended to determine the specific function of integrins and their ligands on the development of these SLPs, and therefore, on synapse development between neurons.

Faculty Mentor: Dr. Michele Lemons

Determining Novel Integrin Ligands that Impact Dendritic Spine Formation

Emily Norman '20

Natural Sciences

Previous studies have shown that transmembrane receptors called integrins are important for dendritic spine formation. These integrins interact with various extracellular and intracellular ligands. The goal of this study was to see how certain extracellular ligands impact dendritic spine formation. These ligands were knocked down using a technique called RNAi which reduces the expression of these ligands. The three ligands studied were *hmr-1*, *epi-1* and *lam-1*. Our data suggests that knocking down these ligands significantly reduces the number of dendritic spines, further indicating they may be important for dendritic spine formation in *C. elegans*.

Faculty Mentor: Dr. Michele Lemons

Investigating How Regenerating Axons are Guided to Their Target Cells

Immaculate A. Ugwumba '19

Natural Sciences

The aim of this project is to determine the mechanisms that regulate the guidance of regenerating axons. It is hypothesized that regenerating cholinergic axons are guided by cues such as netrin and/or cell adhesion molecules. In order to study this hypothesis, a system will be developed to observe the effects of various mutations in genes known to regulate axon guidance on regenerating axons, in real time. The system will include immobilizing live animals in a hydrogel, separating individual cholinergic axons with a laser, and visualizing axon regeneration and guidance in real time.

Faculty Mentor: Dr. Michele Lemons

The Impact of Stress on Cognitive Functioning

Gabrielle Jasmin '19

Psychology

This study explored ways in which stress can impact cognitive functioning. Participants completed several surveys about mental health status, involvement in physical activities, and other demographic variables. Participants were then randomly assigned to complete either the stressful (stress group) or non-stressful (control group) version of the Trier Social Stress Test (TSST; Kirschbaum, Pirke, & Hellhammer, 1993). Following the TSST, participants completed a Stroop task (Stroop, 1935). Some presentation trials included threat; previous work suggests that participants in an anxious state will respond more slowly compared to controls (Mathews & MacLeod, 1985). Our participants in the stress group self-reported significantly higher levels of anxiety than controls. However, while participants responded more slowly on the Stroop task when threat-based words were presented compared to non-threat words, the level of interference did not differ between the two groups. This research was supported by the Center for Neuroscience and fulfills the requirement of the Honors Program.

Faculty Mentor: Dr. Leamarie Gordon

Young Adults' Perceptions of Coparenting Dynamics in their Families of Origin

Hannah Fung '20 and Meghan Foster '20

Psychology

Pregnant couples' perceptions of coparenting in their families of origin have been shown to influence expectations of their future coparenting, though studies have not yet explored these associations in young adults prior to starting their own families. Undergraduate students were individually interviewed about their family-of-origin coparenting perceptions and expectations for their own future coparenting. Findings indicated that negative family-of-origin coparenting perceptions correlated with pessimistic expectations for future coparenting and low confidence in future parenting roles.

Faculty Mentor: Dr. Regina Kuersten-Hogan

Symmetry and the Perception of Houses

Matthew Fogarty '19, Katelyn Anderson '19, and Meghan Sampson '19

Psychology

Previous studies have shown that humans tend to perceive symmetrical faces as more attractive than asymmetrical faces (Rhodes, Proffitt, Grady, & Sumich, 1998). Researchers have begun to examine whether this preference for symmetry extends beyond faces to inanimate objects (Orth & Wirtz, 2014; Tyler, 1999). The purpose of this study was to examine how symmetry influences the appeal and perceived value of houses. Participants viewed images of the interiors and exteriors of homes. Images

within each category were symmetric and asymmetric. Participants rated each image on how valuable and appealing they thought each home was. We found that participants rated symmetrical homes more valuable, particularly for interior images. We found that symmetric homes were rated more appealing, but only for exterior images. Our results suggest that the human bias toward symmetry does extend to homes, and this could have implications for the real estate market.

Faculty Mentor: Dr. Leamarie Gordon

Investigating DNA Repair and Protection Mechanisms in the UV-Resistant Haloarchaea, Halobacterium

Isabella Cafaro and Alyssa Masciarelli '19

Natural Sciences

Halophilic archaea are salt-loving microorganisms that are often found in high UV environments. Because of this, they serve as important model organisms for understanding the processes of DNA repair and protection. *Halobacterium sp.* NRC-1 is one of the most UV resistant organisms ever studied, and we are attempting to understand why this is the case. Photoreactivation (PHR) is a light-dependent photoreversal process for repairing UV damage to the DNA. Nucleotide excision repair (NER) is another mechanism that repairs a variety of DNA lesions, including UV-induced damage, in a light-independent fashion. *Halobacterium* also possesses carotenoid pigments that might be UV protective and serve an accessory role in harvesting blue light for PHR. The contributions each of these mechanisms make to the high UV resistance of *Halobacterium* have not been carefully elucidated. To study these mechanisms, we exposed wild-type and several mutant strains of *Halobacterium* to a range of UV doses and assessed their relative resistance both in the presence and absence of photoreactivating light. Preliminary results suggest that the pigments do not protect against UV light.

Faculty Mentor: Dr. David Crowley

The Role of Priority and Coping in the Relationship Between Optimism/Pessimism and Academic Performance

Anthony Mastrocola '19, Esperanza Jimenez '19, and Hannah Krueger '19

Psychology

The present study investigated optimism/pessimism and its relationship to academic success. An understanding of what contributes to a good/bad academic performance may assist students in their approach to the rigors of an academic workload. Using the CER-Q and WCQ questionnaires, we analyzed different coping mechanisms utilized by optimists/pessimists and its effect on academic performance. We hypothesized that optimists will exhibit greater academic performance than pessimists, as long as academic performance is a priority to them. We also hypothesized that optimists will exercise more beneficial self-regulatory coping strategies than pessimists. Seventy-nine Assumption College undergraduate students completed five surveys to determine their levels of optimism/pessimism, emotion regulation strategies, coping skills, GPA, and priorities. There was no correlation between pessimism and current/expected GPA. We did find both positive and negative correlations between pessimism and certain coping strategies. Relationships was the only priority category that showed positive correlations to both current and expected GPA.

Faculty Mentor: Dr. Fang Zhang

***Identification of an Unknown Bacterium Isolated from
Assumption College's Testa Science Center***

Christina Forrest '19 and Brooke Mullen '20

Natural Sciences

The identification of an unknown bacterium can be an essential factor for determining the causative agent of infections, food spoilage, and developing probiotics, as well as devising bioremediation strategies. In this study, an unknown environmental bacterium was isolated from a push-button drinking fountain on the first floor of Assumption College's Testa Science Center and identified by observing its physical and metabolic characteristics, cell staining patterns, and amplifying and sequencing the 16s rRNA gene. The 16S rRNA gene of the bacterial unknown showed 99% identity with *Dermaococcus nishinomiyaensis* with 1122 base pairs in common.

Faculty Mentor: Dr. Aisling Dugan

Acknowledgements

Thank you to the Undergraduate Symposium committee members (Dr. Leamarie Gordon, Dr. Benjamin Knurr, Dr. Michele Lemons, Prof. Anthony Sacino, Prof. Lynn Simmons, Dr. Samuel Stoner, and Dr. Thomas Wheatland), the student presenters, the faculty mentors, and to all those in attendance who helped make the Symposium a success. A special thanks to Sonia Manseau from the Office of the Provost, as well as Dr. Carl Keyes and Michele Aubin.

Additional thanks to the President of the College, the Office of the Provost, the Communications Office, Business Services, Sodexo, Curry Printing, and Silver Screen Design for their support of the Symposium and assistance preparing for it.

Finally, thank you to Christian Copeley '19, Assumption College music and graphic design major, for designing the Symposium T-shirts, posters and programs.



**Next year's Symposium will be held in
April 2020**

Please mark your calendars!