Promoting Interdisciplinary Conversations

2021 Western Research Day Schedule

Virtual Meeting, May 3-6, 4:00-6:00pm

Monday, May 3rd:

4:00-4:30 pm: Opening Remarks (WRD Committee Chair, Provost Alexander, President Clark)

4:30-5:30 pm: Keynote Address (Dr. Kaston D. Anderson-Carpenter)

Tuesday, May 4th:

4:00-5:00 pm: Virtual Poster Group Sessions #1 and #2

5:00-6:00 pm: Virtual Poster Group Sessions #3 and #4

Wednesday, May 5th:

4:00-5:00 pm: Virtual Poster Group Sessions #5 and #6

5:00-6:00 pm: Virtual Poster Group Sessions #7 and #8

Thursday, May 6th:

4:00-5:00 pm: Presentation of Provost’s Awards for Best Student Poster, Library Research Award, and Sigma Xi Awards
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2021 Keynote Speaker

Title

Justice for All: Using Science to Advance Health and Social Justice for Marginalized and Vulnerable Communities

Abstract

In the past several years, American society has seen a substantial rise in justice-oriented advocacy. As such, academic and professional fields are becoming more reflective of how they may have perpetuated harm against marginalized and vulnerable communities. Although science has been misused and abused to cause harm, when used as intended, it can highlight the voices of the oppressed and integrate multiple ontologies for a comprehensive understanding of the human condition. This talk will center on how scientific fields such as experimental psychology, behavior analysis, community psychology, and public health work in concert to improve health and social justice outcomes for some of the most marginalized and vulnerable communities in the United States.

Kaston D. Anderson-Carpenter, PhD, MPH, BCBA-D, LBA

Dr. Kaston Anderson-Carpenter (he/him/his) is an Assistant Professor of Psychology at Michigan State University. A behavioral psychologist by training, he has master’s degrees in public health, applied behavior analysis, and experimental psychology. His research interests are in addiction and health equity in underserved and marginalized populations. He is also a Board-Certified Behavior Analyst-Doctoral and is licensed in the state of Michigan.

At Michigan State University, he is a Core Faculty in the MSU Consortium for Multicultural Psychology Research, the MSU Center for Sexual and Gender Minority Health, and the MSU Center on Gender in Global Context. Additionally, he is an Affiliate Faculty in the MSU Institute of Public Policy and Social Research. Currently, Dr. Anderson-Carpenter serves as Guest Editor for three scientific journals and is on the Editorial Board for a fourth. Moreover, he is a member of the Association for Behavior Analysis International (ABAI) Practice Board.

Dr. Anderson-Carpenter is an award-winning and sought-after scholar, providing expertise on several national and international projects. Some of these projects include: (1) community engagement and health outcomes for the kink community; (2) HIV, substance use, and
Hepatitis C in First Nations and Métis peoples in Saskatchewan, Canada; and (3) measuring minority stress among transgender adults. His work has been featured on radio and television, and he has given talks to both national and international audiences.

One of Dr. Anderson-Carpenter’s projects examines the psychosocial and behavioral impacts of COVID-19 on adults across five countries. This study is one of the largest, if not the largest, study of its kind, and it includes over 2,500 adults from the United States, Saudi Arabia, Italy, Spain, and India. One of his recent COVID-19 papers examines racial and political disparities between Black and White Michiganders, which is in press in the Journal of Racial and Ethnic Health Disparities.
Faculty Participants

Carina Bandhauer, Sociology
Neeta Connally, Biology
Joshua Cordeira, Biology
Bernard Gee, Psychology
William Joel, Computer Science
Rayda Krell, Biology
Rotua Lumbantobing, Social Sciences
Michelle Monette, Biology
Tom Philbrick, Biology
Theodora Pinou, Biology
Jody Piro, Education and Educational Psychology
Shouhua Qi, English
Hannah Reynolds, Biology
Forest Robertson, Chemistry
Tricia Stewart, Education
Xiaodi Wang, Mathematics
Linda Warren, Nursing
Robert Whittemore, Anthropology
Howell Williams, Political Science
Edwin Wong, Biology
Sharon Young, Social Work
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| 001 | **Alcoholism and Addiction as Tropes in the Works of Edgar Allan Poe and Ernest Hemingway**  
*Alyssa Anderson*  
Group #: 5  
**Advisor:** *Shouhua Qi, English*  
Edgar Allan Poe and Ernest Hemingway's addictions made them famous. Their struggles with alcoholism and drug addiction impacted their works so intensely that they would have been entirely different writers had they been clear-minded throughout the years they composed literature. Many of Poe and Hemingway's short stories, including "Cask of Amontillado", "Ligeia", "Hills like White Elephants", and "A Clean, Well-Lighted Place", are representative of the addictions these authors faced due to the way they project their personal sufferings into the stories themselves. They created characters with deeply problematic traits, themes that are especially controversial, and realms in which a false sense of reality leads to deceit and manipulation for the characters and readers. Poe and Hemingway's addictions altered their work, created their careers, and ended their lives.  
Interdisciplinary: No | Undergraduate  
Wednesday, May 5th: 4:00-5:00pm: Virtual Poster Sessions  
**Judges:** Mohsen Alizadeh (JLA) | Galina Bakhtiarova (Lang.) | Rayda Krell (BIO) | Ken Scaglia (Art)  
URL for poster:  
[Link to poster](#)
Invertebrate Associations with Podostemaceae in the Zuid River, Suriname

*Jacob Bethin*

Group #: 3

**Advisor:** Rayda Krell, Biology

Podostemaceae are aquatic plants found in Southern Asia, Africa, and the Americas. Podostemaceae are known to provide habitat and food for a diverse assemblage of aquatic invertebrates. However, few studies have investigated the diversity of invertebrates associated with Podostemaceae. We cataloged invertebrates collected from Podostemaceae found in the Zuid River, Suriname in 2007. These Podostemaceae are in the genus *Apinagia* and were collected at least 4 km apart. We identified 10 different invertebrate orders and each sample contained approximately 100 to over 3,000 invertebrate specimens. The abundance of invertebrates was found to increase when moving northward through the river. To our knowledge, this is the first study to investigate if Podostemaceae associated invertebrate populations vary throughout a river. This research provides a foundation for future exploration of Podostemaceae associated invertebrates and their interactions on this unusual plant, which could provide useful information for conservation efforts.

Interdisciplinary: No | Undergraduate
Tuesday, May 4th: 5:00-6:00pm: Virtual Poster Sessions

**Judges:** Helena Prieto (Chem) | Patricia Cumella (Nursing) | Jack Tom (Art) | Ed Gleason (Health & Safety)

URL for poster:
[Link to poster](#)
A Mixed Methods Study on the Effect of Emotional Awareness Exercises on Adaptiveness in Coping and Empathy with Preservice Teachers in Mixed Reality Simulations

Ashley Brooksbank

Group #: 1

Advisor: Jody Piro, Education and Educational Psychology

The purpose of this study is to gain insight into the perceived importance of emotional awareness with pre-service teachers (PSTs) participating in a mixed reality simulator (MRS), as well as the impact of emotional awareness exercises in an MRS on adaptiveness in coping and empathy. This study will add to the lack of research on the development of adaptive coping and empathy as well as contribute to the research on how SEL impacts students within teacher education programs. Additionally, emotional awareness exercises have the potential to impact emotional regulation, emotional recognition, and appraisal skills, therefore having the potential to aid in the development of preservice teachers' emotional awareness and skills in the mixed reality simulator. A mixed-methods convergent research design was used to triangulate the quantitative, quasi-experimental statistical results with qualitative, multiple case study data from participant surveys and interviews.

Interdisciplinary: No | Graduate
Tuesday, May 4th: 4:00-5:00pm: Virtual Poster Sessions
Judges: Rotua Lumbantobing (Social Sci) | Catherine Rice (Nursing) | Rakhee Agarwal (Hospital) | Ed Wong (BIO)
URL for poster: Link to poster
U.S. Immigration Law and Its Impacts on "the Pursuit of Happiness": A Comparative Analysis

Joao Caetano de Sa

Group #: 2

Advisor: Carina Bandhauer, Department of Social Sciences

The U.S. Constitution provides few substantive guiding posts for the process of immigration. Instead, it leaves to Congress the power to "establish an [sic] uniform Rule of Naturalization" (Article I, Sec. 8, Cl. 4). Since the enactment of what is widely known as the first control on immigration, the Immigration Act of 1882, the influx of migrants were limited in two distinct ways: (1) the Act imposed a "head tax" on each arriving non-citizen; and (2) it provided for the immediate refusal of (a) foreign convicts; (b) "lunatic[s]"; (c) idiots; or (d) persons likely to become a public charge " now known as "bars to admissibility." Using a comparative analysis method, this study examines the impact of immigration law on the American foundational principle of the "Pursuit of Happiness." Findings underscore the shortcomings of an ever-stringent regulatory environment pre- and especially post-9/11/01 that do, indeed, hinder the Pursuit of Happiness.

Interdisciplinary: No | Undergraduate
Tuesday, May 4th: 4:00-5:00pm: Virtual Poster Sessions
Judges: Jennifer Flynn (MIS) | Thomas Miller (JLA) | Roger Conner (Police) | Carol Huang (Finance)
URL for poster:
Link to poster
"I am too much i' the sun": Five Stages of Grief and the Tragedy of Hamlet

Sophia Caselnova

Group #: 3

Advisor: Shouhua Qi, English

The Five Stages of Grief, as established by Elisabeth Kübler Ross, break down the process of grieving losses into five different categories to aid in one's understanding of their experiences. Loss and grief are by no means easy, and this is dramatized in Shakespeare's tragedy Hamlet. As Hamlet faces the loss of his father, witnesses the incestual marriage of his mother and paternal uncle, learns it was indeed his uncle who murdered his father, and then faces the tribulations of carrying out the revenge, he has no option but to travel through the five stages of grief. This project argues that it is the lack of efficacy in moving through his grieving process that led to the delay in his revenge rather than the established explanations such as the Freudian concept of Oedipal Complex.

Interdisciplinary: No | Undergraduate
Tuesday, May 4th: 5:00-6:00pm: Virtual Poster Sessions
URL for poster: Link to poster
Optimization of the Synthesis of 2-Substituted Tetrahydrothiophenes

Emma Dolan

Group #: 4

Advisor: Forest Robertson, Department of Chemistry and Biochemistry

Tetrahydrothiophenes are important structural motifs because they have been shown to possess anticarcinogenic, antihypertensive, antiviral, antibacterial, antithrombotic, and antitumorigenic properties. Various synthetic methods have been developed to access tetrahydrothiophenes; however, most of these processes require the substrate to be activated before it is able to react. Methods have been developed that employ a substrate that needs no pre-activation, but they also implemented sodium sulfide or hydrogen sulfide as the sulfur source, which are both highly toxic. Dr. Robertson's previous research utilized sodium phosphorothioate salts, which provide a non-toxic and reactive source of sulfur to synthesize a library of chiral tetrahydrothiophenes. In an effort to expand the synthetic chemist's toolbox, we explored a four-step synthetic protocol to access 2-substituted tetrahydrothiophenes that utilized an epoxide intermediate as the synthetic handle instead of the linchpin ketone used in the previously developed method.

Interdisciplinary: No | Undergraduate
Tuesday, May 4th: 5:00-6:00pm: Virtual Poster Sessions
Judges: Kimberlee-Ann Bridges (nursing) | Marie Elena Cordisco (Hosp) | Paul Simon (Retired) | Diane Bennett (Nursing)
URL for poster: Link to poster
Glycerol, a key element produced by soil microbes, is involved in osmotic regulation as a response to salt stress. This led us to ask; how does an increase in salt concentration alter glycerol production? The experiment preludes that an increase in NaCl or CaCl2 concentrations causes an increase in microbial glycerol production. Soil sediment was collected to analyze glycerol production by microbes exposed to various concentrations of NaCl and CaCl2. The results showed a notable difference between the two salts in comparison to the control mean. However, the difference was not significant enough due to the low sensitivity of the glycerol kit. Higher concentration of salt might be necessary to induce more glycerol production.
Students' and Educators' Perspectives on Student Connectedness to School: Social Support, Engagement & Belonging

Thomas Fox

Group #: 1

Advisor: Tricia Stewart, Department of Education and Educational Psychology

A student’s level of connectedness to their school community can have several short and long-term positive impacts on their well-being. However, not all students appear to be as connected to their school as others. The purpose of this study is to gain a deeper understanding of students' and educators' perspectives regarding student connectedness to school and its relationship to social support, engagement, and belonging. Ultimately, a richer, more nuanced understanding of these concepts can be used to inform policy changes "especially at the secondary level" that increase student connectedness to school. A mixed-method parallel research design was selected to understand the phenomenon of school connectedness from the vantage point of students and educators. The quantitative portion of the study will include analyzing pre-existing survey data from a high school within the Northeastern region of the United States. The qualitative portion of the study includes interviews and document analysis.

Interdisciplinary: No | Graduate

Tuesday, May 4th: 4:00-5:00pm: Virtual Poster Sessions

Judges: Deborah Augenbraun (Counseling) | Rotua Lumbantobing (Social Sci) | Krista Heybruck (HPX) | Ed Wong (BIO)

URL for poster:
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Group #: 6

**Advisor:** Shouhua Qi, English

"The Heart of Darkness" by Joseph Conrad, Kurtz and Marlow are the main characters in this story. Kurtz is an obvious racist degenerate who takes advantage of the Congolese people. Forcing them into labor to meet his monthly quota of Ivory. Kurtz is the obvious antagonist in this story however, Marlow himself should not be considered the protagonist but a subtle antagonist. Marlow isn’t as vicious in his treatment towards the Congolese people as Kurtz is; however, he does see himself as superior to them. His medium darkness stems from his inability to see these people as humans instead of savages who need a "superior" race such as himself to civilize them. Conrad attempt to bring awareness to imperialism in this book are greatly noted however, he also conveys his repressed feelings about the African people and where they are placed in the class system.

Interdisciplinary: No | Undergraduate  
Wednesday, May 5th: 4:00-5:00pm: Virtual Poster Sessions 
**Judges:** Kevin Burnard (Management) | Xiaoqi Han (Marketing) | Stephanie Kuhn (Education) | Jeanette Lupinacci (Nursing) |

URL for poster: [Link to poster](#)
Novice Nurse Practitioners' Perceptions of Role Transition

_Doreen Graham_

Group #: 1

**Advisor:** Linda Warren, Nursing

Exploring the experiences of novice NPs in their role transition may help health and academic institutions improve orientations for novice NPs. The aim of this study was to examine the experiences of novice NPs in their role transition during the first two years of NP practice. A descriptive qualitative methodology was used to capture the experiences and perceptions of role transition of novice nurse practitioner participants within their first two years of practice in the state of Connecticut. The purposive sample of nine novice nurse practitioners participated in this study. Data was collected from face-face interviews and qualitatively coded into themes. Analysis of the data from interviews identified three central themes that emerged: recognizing need for self-efficacy, straddling and expanding role identities, and frustration with expectations of the novice. The results of this qualitative study assist in providing an understanding of role transition from the perspective of the novice NP.

Interdisciplinary: No  |  Graduate
Tuesday, May 4th: 4:00-5:00pm: Virtual Poster Sessions

**Judges:** Julie Perrelli (HPX)  |  Catherine Rice (Nursing)  |  Aura Lippincott (Designer)  |  Denise Coainni (HPX)

URL for poster:
[Link to poster](#)
Comparing Online Lecture Presentation Styles  
Ashley Green

Group #: 8

Advisor: Bernard Gee, Psychology

With online learning reaching more students than ever before, there is an increasing need to determine which of existing pedagogical techniques are most optimal. Instructors offer a variety of online course styles and formats, yet little research compares the array of teaching styles available for remote-learning. We were therefore interested in investigating potential differences between two common and popular lecture techniques. To examine different methods, participants were asked survey questions about learning preferences and experience, and watched an asynchronous lecture presented as either a PowerPoint or white board video on the topic of synaptic transmission. I will report on the performances of students on a post-video quiz, as well as their experiences and attitudes towards online teaching methods. The results will contribute to our understanding of the best online teaching practices.

Interdisciplinary: No | Undergraduate
Wednesday, May 5th: 5:00-6:00pm: Virtual Poster Sessions
URL for poster: [Link to poster]
The Effects of Competency-Based Education on Undergraduate Students at WCSU

Taylor Green

Group #: 2

Advisor: Robert Whittemore, Anthropology

In a neoliberal world, everything in society, not just the market, must directly and positively impact economic growth. Universities are no exception to this rule. As needed engines of innovation and economic growth, universities were thought to be too far removed from the needs of corporations and the economy (Ward, 2012). To promote the shift of education into an economic tool, it is looked at through a managerial lens. Professors are forced to prove their knowledge and its relation to a competency to administrators and board members that have little to no background in the subjects. This takes more time out of educators’ schedules and allows less autonomy in teaching as well as a possible disconnect between students and professors. This research includes interviews from undergraduate WCSU students to determine both positive and negative effects, and the usefulness, of a competency-based learning system on students in higher learning institutions.

Interdisciplinary: No | Undergraduate
Tuesday, May 4th: 4:00-5:00pm: Virtual Poster Sessions
URL for poster: [Link to poster](#)
Assessing the impact of an educational tool on the attitudes and beliefs of stakeholders surrounding common loon restoration

Ericka Griggs

Group #: 1

Advisor: Michelle Monette, Biology

In the summer of 2020, the Biodiversity Research Institute successfully translocated 12 common loon (*Gavia immer*) chicks from Maine into southeastern Massachusetts. With the success of this translocation there is the reasonable concern that stakeholders, whom have never had to coexist on a lake with common loons, could have conflict with this state listed species of concern. That is why I hypothesized that Common loon education and outreach could be used to prevent human-wildlife conflicts, and to generate a positive attitude towards this species as it rehabsitats southeastern Massachusetts. Stakeholders were determined, and then presented an educational PowerPoint on the loon restoration efforts in southeastern Massachusetts. To gauge the effectiveness of this educational tool, pre- and post-survey data were collected through Survey Monkey. The purpose of the surveys was to determine the demographics, attitudes, and willingness to change practices, surrounding common loon restoration, before and after hearing the presentation.

Interdisciplinary: No | Graduate
Tuesday, May 4th: 4:00-5:00pm: Virtual Poster Sessions
Judges: Deborah Augenbraun (Counseling) | Catherine Rice (Nursing) | Rakhee Argwal (Hospital) | Aura Lippincott (Designer)
URL for poster: [Link to poster](#)
Gender, Race, and the Portrait of a Woman in Henry James' Daisy Miller and Zora Neale Hurston's Their Eyes were Watching God

*Kanalla Hay*

Group #: 4

Advisor: *Shouhua Qi, English*

Henry James (1843-1916) wrote about Americans in Europe in novels such as Daisy Miller. Zora Neale Hurston (1891-196), in her novels such as Their Eyes Were Watching God, wrote about race in Southern America. Two completely different authors chose to address issues in society through the eyes of a woman. Daisy Miller is a young, white American woman in Europe in the 1870s. She was the product of a white, male, American-turned-European citizen's idea of women and the differences between Europeans and Americans. Janie Mae Crawford, on the other hand, is a grown, black American woman in the South of the 1930s, the product of a black female American author's idea of black women in a predominantly black society and the impact of race on a community. Both characters are going against society's expectations and opinions to establish their identity and embrace their own desires.

Interdisciplinary: No | Undergraduate
Tuesday, May 4th: 5:00-6:00pm: Virtual Poster Sessions
Judges: Marie Elena Cordisco (Hosp) | Diane Bennett (Nursing) | Kimberlee-Ann Bridges (Nursing) | Maribeth Griffin (Residential)
URL for poster: [Link to poster](#)
| 015 | **DACA: It's Impact on Undocumented Youth and Recommendations for Reform**  
*Rina Hernandez*  

Group #: 5  

**Advisor:** Carina Bandhauer, Sociology  

This research project examines DACA (Deferred Action for Childhood Arrivals), how it affects those in the program (Dreamers), and how it can be improved. This project explores the history of DACA and its policies. Interviews have also been conducted with DACA recipients to reveal the perspectives of those affected by DACA and ideas on how it can be improved. The interviews also shed light on how DACA helps Dreamers and how it fails to provide aid in certain areas, such as higher education. Recommendations for improving DACA and how the Obama, Trump, and Biden administrations tried to alter DACA are also considered. This project's primary goal is to shed light on DACA and how it affects the young people in the program.  

Interdisciplinary: No  
Undergraduate  

Wednesday, May 5th: 4:00-5:00pm: Virtual Poster Sessions  
**Judges:** Mohsen Alizadeh (JLA)  
Jeffrey Schlicht (HPX)  
Teresa Puckhaber (Nursing)  
Ken Scaglia (Art)  

URL for poster: [Link to poster](#)
The Effect of Food Quality on Exercise-Induced Alterations in High-Fat Food Intake

Emily Hoegler

Group #: 7

Advisor: Joshua Cordeira, Biology

Exercise reduces consumption of very high-fat diet (VHFD). In previous experiments, however, we noticed this may not be true when VHFD is oxidized (stale). In this study, we directly tested whether the benefit of exercise on VHFD intake depends on food quality (freshness). We measured feeding behavior in mice fed fresh or stale VHFD daily, with and without 30-minutes of wheel running. We found that mice ate more when VHFD was fresh rather than stale. Low intensity exercise reduced fresh but not stale VHFD intake. These results together suggest that exercise reduces over consumption of fresh VHFD. Importantly, exercise reduced overeating exclusively during the light (inactive) period when feeding is known to be especially obesogenic. These results provide insight into exercise-induced alterations in VHFD intake and identify food quality as a potentially confounding variable in obesity research.

Interdisciplinary: No | Undergraduate
Wednesday, May 5th: 5:00-6:00pm: Virtual Poster Sessions
Judges: Kristin Giamanco (BIO) | Jeanette Lupinacci (Nursing) | Alba Hawkins (Lang.) | Hasan Arslan (JLA) |
URL for poster:
Link to poster
Screening Connecticut Lakes for Cyanobacterial Toxin Genes

*Faizah Karim*

with: Chris Dwyer

**Group #: 6**

**Advisor:** Edwin Wong, Biology

Cyanobacteria ("blue-green algae") blooms are dangerous to humans, dogs, and other animals since they produce toxins such as the liver toxin microcystin (MCY), and the neurotoxins anatoxin (ANA) and saxitoxin (SXT). We isolated cyanobacterial DNA from Candlewood Lake, Lake Zoar, Beseck Lake and Bantam Lake, places commonly used for recreation. Quantitative PCR (qPCR) was used to measure the copy number of the MCY, ANA, and SXT genes as an indicator of toxin production capability. The phycocyanin gene (PC) was also measured as an internal standard for all cyanobacteria. Various quantities of the three toxin genes were detected in the lakes studied.

Interdisciplinary: No | Undergraduate

Wednesday, May 5th: 4:00-5:00pm: Virtual Poster Sessions

**Judges:** Ethan Balk (HPX) | Xiaqi Han (Marketing) | Stephanie Kuhn (Education) | Rainer Kroll (JLA)

URL for poster:

[Link to poster](#)
Crossing the Threshold to Teacher: The Role of Liminality in the Formation of Teacher Identity in Preservice Teachers

Emily Kilbourn

Group #: 1

Advisor: Jody Piro, Education and Educational Psychology

Educational research from the last twenty years indicates a growing interest in teacher identity; however, preservice teachers are not often the subject of inquiry. At stake is the connection between teacher identity and factors that immediately and directly impact the quality, effectiveness, and staying power of in-service teachers. The research design for this study is an interpretive case study, intended to explore how preservice teachers understand the formation of their teacher identities within the notion of liminality, foregrounded by their experiences in mixed reality simulations (MRS) of teaching. Data collection includes a demographic survey, an observational protocol, pre/post simulation brief interviews, a comprehensive end-of-course semi-structured interview protocol, and documents. Data will be analyzed deductively and inductively. Because MRS simulations effectively activate liminality, it is hoped that this study will contribute to a better understanding of the connection between teacher identity formation and liminality.

Interdisciplinary: No | Graduate
Tuesday, May 4th: 4:00-5:00pm: Virtual Poster Sessions
Judges: Deborah Augenbraun (Counseling) | Rotua Lumbantobing (Social Sci) | Krista Heybruck (HPX) | Ed Wong (BIO)
URL for poster: [Link to poster](#)
This research will be based upon discovering the economic impacts, both long term and short term, of the Covid-19 pandemic. Using secondary data from the CDC, Johns Hopkins University, Oxford University, and the Brookings Institute, we will evaluate specific causes of economic impact as well as how the economy has changed and how it will continue to change due to this worldwide pandemic. This will be a longitudinal cross-sectional study that looks at secondary data of Covid-19 death and case statistics and compares them to economic changes. We will also use data from secondary sources to gather likely long term economic changes that might result from the pandemic.
The Effects of High Salt Concentrations on Microbial Glycerol Production

*Joseph Leo*
with: Shannon Miranda & Carly Mengler

Group #: 4

**Advisor:** *Hannah Reynolds, Biology*

During heavy snow storms, common deicers in the US, such as sodium chloride and calcium chloride, are utilized to melt snow. Overuse of these deicers causes salinization, an accumulation of salt in the soil that can harm the microbial communities. Microbial fungi have been known to produce glycerol (an osmotic regulator) to combat the osmotic pressure presented by salts. This study aims to observe microbial glycerol production based on varying salt concentrations. We hypothesized that higher salt concentrations will induce glycerol production. To test this, we treated soil samples to different salt concentrations and monitored their glycerol production using a glycerol assay. Our results indicate that on average, glycerol production increased with higher salt concentrations but there was no significant difference among treatments. Future researchers can study higher salt concentrations using a more sensitive glycerol assay.

Interdisciplinary: No | Undergraduate
Tuesday, May 4th: 5:00-6:00pm: Virtual Poster Sessions

**Judges:** Paul Simon (Retired) | Kimberlee-Ann Bridges (Nursing) | Ron Mason (Housing) | Diane Bennett (Nursing)

URL for poster:
[Link to poster](#)
| 022 | **The Effects of NaCl and CaCl2 on Microbial Metabolism**  
*Brittany Lyon*  
with: Krisa FitzGerald  
Kaitlyn Hargreaves  
Christopher Arnone  

Group #: 5  

**Advisor:** Hannah Reynolds, Biology

Vast quantities of salts are applied to roadways to decrease ice accumulation. When ice melts with increasing temperatures, the salts migrate to the surrounding soil, causing detrimental effects to microbes. The most commonly used road salt is NaCl. Previous research has shown that CaCl2 may be less harmful to microbial life. However, it is unknown whether NaCl or CaCl2 is less inhibitory to microbial growth. If CaCl2 acts as a nutrient and NaCl acts as a toxin, then microbial growth will be less inhibited when using CaCl2. Using Ecoplate analysis, microbial growth and metabolism were studied, using 50 and 250 ppm CaCl2 and 50 and 250 ppm of NaCl. Our results demonstrate that 50 ppm CaCl2 had the lowest negative impact, while 50 ppm NaCl had the highest negative impact on microbial metabolism. This suggests that CaCl2 may be a safer alternative to NaCl as a road salt.

Interdisciplinary: No  
Undergraduate  
Wednesday, May 5th: 4:00-5:00pm: Virtual Poster Sessions  
**Judges:** Rayda Krell (BIO) | Jeffrey Schlicht (HPX) | Eileen Campbell (Nursing) | Teresa Puckhabler (Nursing)  
URL for poster:  
[Link to poster](#)
The Importance of Epibiont Research: Epibiont Abundance and Biodiversity on Loggerhead Sea Turtles (*Caretta caretta*) Following the 2010 Gulf Oil Spill

*Molly McMahon*

Group #: 8

**Advisor:** Theodora Pinou, Biological and Environmental Sciences

Epibionts are organisms that live symbiotically with sea turtles and are very diverse marine organisms. In recent years, epibionts have been linked to illnesses, such as fibropapillomatosis and Debilitated Turtle Syndrome (DTS). In this study, I analyzed epibionts collected from Loggerhead turtles in Casey Key, FL in 2006, 2007, 2008, and 2010 to determine if the epibiont community on the turtles changed over time, in either abundance or biodiversity. My analysis finds that there is no significant change in the biodiversity of epibionts per turtle, but there is a significant increase in overall epibiont abundance per turtle following the 2010 Gulf Oil Spill, despite fewer turtles sampled and consistent sampling technique. One possible explanation is rising sea surface temperatures that increase reproduction and development of marine invertebrates. Additional epibiont collection is planned for Summer 2021 to gain a better understanding of how these changes will affect turtle health.

Interdisciplinary: No | Undergraduate
Wednesday, May 5th: 5:00-6:00pm: Virtual Poster Sessions
**Judges:** Karen McLean (HPX) | Brian Stankus (Chem) | Hannah Reynolds (BIO)
URL for poster: [Link to poster](#)
The cultural shift around the gaining popularity of Christianity is mainly illustrated through the notions of chivalry for men and chastity for women. Geoffrey Chaucer, the author of The Canterbury Tales, subverts the Medieval Christian Church, critiquing the hypocrisy of the institution as a whole. Between the Early Middle Ages and the Late Middle Ages, the Britons went through a cultural change from pagan religions to Christianity and then back to pagan religions through pagan revivalism. The women of The Canterbury Tales, both within the tales or the women of the pilgrimage, can be divided equally between chaste women and sinful women - the women act as caricatures of sin or saints as Chaucer comments on this cultural shift. Chaucer, with his array unconventional or even liberated female characters, uses socially incorrect humor as a means to satirize the Medieval Christian notions of right and wrong iconoclastically.

Interdisciplinary: No | Undergraduate
Wednesday, May 5th: 5:00-6:00pm: Virtual Poster Sessions
Judges: Alba Hawkins (Lang) | Josh Cordeiro (BIO) | Jeanette Lupinacci (Nursing) | Hasan Arslan (JLA)
URL for poster:  
Link to poster
Introduction of Native *Podostemum ceratophyllum* Michx. (Podostemaceae, Hornleaf Riverweed) into the Norwalk River, Wilton, CT

*Kelly Nealon*

Group #: 1

**Advisor:** Tom Philbrick, Biology

*Podostemum ceratophyllum* is a native aquatic flowering plant that occurs only attached to rocks in river rapids. In recent years, the species has notably declined in numbers. Ecological importance of *P. ceratophyllum* in rivers is well documented. This research marks the first attempt to transplant the species into a river where it was not known to occur. The plant was taken from two "donor" rivers, and moved into the Norwalk River as well as between the two donor rivers. Relative growth rate was significantly impacted by the location the plants were moved to, but not by source plants were moved from. Transplanted *P. ceratophyllum* grew in each of the three rivers, although relative growth rate was significantly lower in the Norwalk River. Results from one field season show that the methodology used to transplant *P. ceratophyllum* was successful, as the plants survived and grew during the 4-5 month period.

Interdisciplinary: No | Graduate
Tuesday, May 4th: 4:00-5:00pm: Virtual Poster Sessions
**Judges:** Julie Perrelli (HPX) | Kim Marino (JLA) | Rakhee Agarwal (Hospital) | Denise Colainni (HPX)
URL for poster: [Link to poster](#)
Development of a 3D Graphic Pen

Hao Nguyen

Group #: 7

Advisor: William Joel, Computer Science

The goal of this research is to create a device that can track and process its own inertia motion. The data is to be spontaneously sent to a computer in the form of a 3D cartesian coordinate. The computer will then generate a virtual graphical display of the position of the device. The implementation of this device is to allow children to use the device as a pen to draw in space, and to visualize their drawing on a graphical display. What has been accomplished so far includes the theoretical and conceptual design to the problem, resource gathering, and initialization. This project utilizes arduino nano and an MPU6050 module to process inertial gyroscopic and acceleration information from the device. Initializing the project and mathematical design of instantaneous conversion from acceleration to displacement, as well of the rest of the milestones will be documented in future work.

Interdisciplinary: No | Undergraduate
Wednesday, May 5th: 5:00-6:00pm: Virtual Poster Sessions
Judges: Josh Cordeiro (BIO) | Kristin Giamanco (BIO) | Galina Bakhtiarova (Lang.) | Hasan Arslan (JLA)
URL for poster:

Link to poster
A Qualitative Exploration of Veteran Identity, the Intersectionality of Other Identities and their impact on Veterans.

George Ondek

Group #: 6

Advisor: Sharon Young, Social Work

To examine veteran identity and intersectionality of other identities an Interpretive Phenomenological Analysis (IPA) was used on a sample of eight Post 9/11 veterans. Semi-structured interviews were conducted on veterans and included questions such as: How do you think you as a veteran see the world differently than non-veterans? and What challenges did you have regarding being (insert other identity here) in the military? IPA protocol was used to analyse the interview transcripts. This protocol included examining transcripts for thoughts, reflections, and interpretations which then led to the reduction of data into coded themes. The themes have not been completely determined; however, some preliminary analysis has found that veteran identity is largely dependent upon the contrast of their military experiences to civilian life. Having a veteran identity is protective overall, even when oppression is experienced due to other identities.

Interdisciplinary: Yes, Social Work | Undergraduate
Wednesday, May 5th: 4:00-5:00pm: Virtual Poster Sessions

Judges: Ethan Balk (HPX) | Kevin Burnard (Management) | Xiaoqi Han (Marketing) | Rainer Kroll (JLA)
URL for poster: Link to poster
Using Gas Prices to Evaluate Economic Trends
Bianca Pasqualone
with: Nora Swift
Jacob Schultz
Isis Lowhar
Jonathan Barney

Group #: 3

Advisor: Rotua Lumbantobing, Social Sciences

Fuel prices reflect economic growth and shrinkage: high prices mean the economy is growing, while low prices mean the economy is declining. Throughout the Covid-19 pandemic, we have seen significant drops in prices as the economy descended into a recession. People stopped traveling, going out, and spending money towards recreational activities. In this research, we observed local fuel prices over the course of two months to understand these fluctuations. Our research tracks different payment methods, different grades of gasoline, and prices of diesel fuel. Our data analysis provides insights on buying patterns and broader economic trends. We expect to see fuel prices rising as the economy begins to recover, and travel becomes frequent again. There are also external events, such as the blockage of the Suez Canal, that could influence the price of gas. Our research will help us to understand these economic trends and changes.

Interdisciplinary: No | Undergraduate
Tuesday, May 4th: 5:00-6:00pm: Virtual Poster Sessions
Judges: Helena Prieto (Chem) | Patricia Cumella (Nursing) | Jack Tom (Art) | Aura Lippincott (Design)
URL for poster: Link to poster
Classifying Drivers of Deforestation Using T-SNE Based Machine Learning Methods

*Shelby Simpson*
with: Namir Naba, William Stanley

Group #: 5

**Advisor:** Xiaodi Wang, christofis@wcsu.edu

Developing and implementing effective policies of forest conservation and management is dependent upon targeted identification and characterization of the processes leading to deforestation. In this project we will classify primary forest loss drivers using tensor-based deep learning methods to aid in the formation of these policies. By studying primary forest loss in Indonesia, we will seek to characterize these direct drivers. We will use this data to build and tune models that effectively solve this problem and outperform current offerings.

Interdisciplinary: No | Undergraduate
Wednesday, May 5th: 4:00-5:00pm: Virtual Poster Sessions
**Judges:** Galina Bakhtiarova (Lang.) | Rayda Krell (BIO) | Mohsen Alizadeh (JLA)
URL for poster: [Link to poster](#)
Synthesis of 2-Substituted Thietanes

Frederick Tauro

Group #: 8

Advisor: Forest Robertson, Department of Chemistry and Biochemistry

The formation of C'S bonds has been achieved through various methods involving the activation of substrates prior to subsequent activity. However, to expand the scope of C"S bond formation, a synthetic method currently being developed in the Robertson group, which allows efficient access to 2-substituted tetrahydrothiophenes (THTs), will be applied to this investigation. By treating 4-bromo-1-butene with mCPBA to afford 4-bromo-1-butene oxide, followed by an SN2 reaction using sodium O,O-diethylphosphorothioate, a common intermediate can be produced, which is O,O-diethyl S-(2-(oxiran-2-yl)ethyl) phosphorothioate. Treatment of this intermediate with various nitrogen nucleophiles will produce the desired alcohols, and subsequent cyclization using NaH will afford 2-substituted thietanes. Thietane-containing molecules have been shown to possess hypotensive, antiviral, anticancer, and prothrombotic properties. With an efficient process for accessing 2-substituted thietanes, the effect of various substituents on the synthesized thietane molecule can be assessed for their medical, chemical, or overall scientific relevance.

Interdisciplinary: No | Undergraduate
Wednesday, May 5th: 5:00-6:00pm: Virtual Poster Sessions

Judges: Karen McLean (HPX) | Jennifer O'Brien (Library) | Hannah Reynolds (BIO)

URL for poster:

Link to poster
This qualitative research study is focused on personalized learning as an instructional model and its influence on educators' perceptions of student agency and empowerment in the school setting. The purpose of this study is to better understand the ways personalized learning takes place in schools and how this relates to student agency and student empowerment. This case study is being conducted in an affluent, socioeconomically diverse district that is known to support personalized learning for students. Participants were drawn at random from educators in this district, who expressed an interest in participating in the study. The qualitative data collection is based on semi-structured interviews, followed by a coding analysis of the transcribed interviews using open/axial coding strategies, which will be expanded for the development of theme creation. This will support an emergence of new knowledge and understanding between the concepts of personalized learning, student agency, and student empowerment.
How Roadside Salts Can Affect Microbial Metabolism

Aine Tuohy  
with: Kenny Thach & Jeremy Correia  

Group #: 6  

Advisor: Hannah Reynolds, Biology  

Since the 1940s, distribution of road salts prior to freezing temperatures has led to mass accumulation of salt concentrations along the sides of the road in America. This salt runs into the groundwater and can affect the osmotic processes of microbes, possibly inhibiting microbial growth. We hypothesized that if road salt causes osmotic stress, then at high salt concentrations the microbial metabolism will be less than the metabolism at lower concentrations. We also considered that sodium chloride would be more inhibitory than calcium chloride because sodium ions can cause sodium toxicity. Using EcoPlates, we determined the metabolism of microbes at different salt concentrations from soil taken from Ives Pond and the Still River in Danbury CT. Our experiment showed at low concentrations, calcium chloride had more metabolism than sodium chloride. Ultimately, our results show that more research needs to be done on the effects of road salt on roadside environments.

Interdisciplinary: No | Undergraduate  
Wednesday, May 5th: 4:00-5:00pm: Virtual Poster Sessions  
Judges: Ethan Balk (HPX) | Kevin Burnard (Management) | Rainer Kroll (JLA) | Stephanie Kuhn (Education)  
URL for poster:  
Link to poster
The effects of peridomestic microclimate on survival of *Ixodes scapularis* ticks

*Danielle Weiss*

Group #: 7

**Advisor:** Neeta Connally, Biology

*Ixodes scapularis* ticks are vectors of human pathogens in northeastern United States, and are found in peridomestic settings, at properties containing wooded areas where ticks thrive in humid leaf litter microclimates. The role of peridomestic microclimates found across the residential landscape has not been well-characterized and may play a role in tick survival. We conducted an arena study to characterize residential microclimate and measure nymphal tick survival in three zones, including wooded and lawn areas close and far from the wooded edge. Although mean daily temperature was significantly lower and daily relative humidity was significantly higher in wooded areas compared to lawn areas, *I. scapularis* survival was not associated with zone. Regardless of zone, we found a lower probability of nymphal tick survival in arenas when maximum daily arena temperatures exceeded 25°C. Tickborne disease risk may depend on microclimate characteristics, and tick exposure may occur in lawns excluding wooded areas.

Interdisciplinary: No | Undergraduate
Wednesday, May 5th: 5:00-6:00pm: Virtual Poster Sessions

**Judges:** Alba Hawkins (Lang.) | Josh Cordeiro (BIO) | Kristin Giamanco (BIO) | Eileen Campbell (Nursing) |

URL for poster: [Link to poster](#)
Stakeholder Incentives and Land Use Regulation in Fairfield County
Lukasz Zbroszczyk

Group #: 3

Advisor: Howell Williams, Political Science

This paper seeks to identify the level and nature of the participation of homeowners in the process of setting land use regulations. It sheds light on the role homeowners' incentives and NIMBY sentiments play in suppressing or promoting new land development in Fairfield County, and the implications this has for the availability of affordable housing and inequality in the area. Through a content analysis of minutes from planning and zoning board meetings in Stamford and Danbury, this paper argues that homeowners are not as economically sophisticated as the literature claims. Their motivations for expressing exclusionary sentiments in public hearings of zoning and planning boards go beyond rational response to risks to their property value. Intangibles such as "character of the neighborhood," often motivate homeowners to act against their economic interest.

Interdisciplinary: Yes, Political Science | Undergraduate
Tuesday, May 4th: 5:00-6:00pm: Virtual Poster Sessions
URL for poster: Link to poster
WRD Planning Committee
Dr. Michelle Monette, WRD Chair, Biological & Environmental Sciences
Dr. Adam Brewer
Dr. Bernard Gee, Psychology
Debbi Johnson, Biological & Environmental Sciences
Brian Stevens, Library and WCSU Archives
Emily Stevens, Health Promotion and Exercise Science