eSSD 2020 Virtual Presentations

Virtual Poster Presentations*

*If the presentation is scheduled to have multiple presentation times, the presentation will be listed in the earliest time with additional times noted. Organized by time and then original locations.

BEGINNING AT 9:00 A.M.

HENRY HALL ATRIUM 002

White Saviorism and American Imperialism: An Analysis of the Peace Corps
Presenter: Madison Svoboda
Mentor: Leifa Mayers, Women, Gender, and Sexuality Studies

My research is focused on the Peace Corps, specifically looking at the experiences of volunteers in order to see how they are reinforcing and/or resisting white saviorism and American imperialism. I used an intersectional approach in order to understand how the experiences of volunteers are shaped by racial and national relations of power. I have used discourse analysis to analyze blogs made by Peace Corps volunteers in order to see if narratives of the US needing to save the world and spreading American values were present. My preliminary findings suggest that many PCVs are critically examining their work as volunteers, while others are continuing to perpetuate attitudes of Americans needing to help poor people in Africa and American superiority over other countries. This research is significant in understanding how volunteers may be unwittingly reproducing ideas that American volunteers are needed in other countries.

HENRY HALL ATRIUM 021

Determining the Mechanism of Histamine Action in the Post-mating Response of Drosophila Females
Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM
Presenters: Georgie Blake, Lauren Gerritsen, Erika Spafford, Paige Zielinski
Mentor: Martin Burg, Biomedical Sciences

Histamine has been studied as a neurotransmitter in Drosophila and is required for a number of nervous system functions. Histamine has recently been localized outside of the nervous system, in the male accessory gland (fly prostate). Histamine was localized to secondary cells in these glands, shown to be required for a number of female post-mating responses (PMRs). Elimination of
secondary cells disrupts several PMRs such as egg laying, sperm viability and female receptivity to
male courtship advances. To determine whether histamine signaling drives female-specific PMRs,
wild-type females were mated with normal, Hdc mutant males lacking histamine, or ort mutant males
bearing a disrupted histamine receptor. Results indicate that disruption of histamine synthesis in
males interferes with the PMR of female receptivity. This work demonstrates that histamine functions
in tissues outside of the nervous system and appears to be necessary for normal post-copulatory
behavior in female flies.

HENRY HALL ATRIUM 022
Recruitment Strategies for Cognitively Impaired Older Adults in Assisted Living Communities
Presenters: Paige Greer, Elizabeth Hill, Katelyn Ware
Mentor: Rebecca Davis, Nursing

It is well documented that recruiting persons with dementia for research in long term care settings is
challenging (Lam, et. al. 2018). The purpose of this study is to explore recruitment techniques
suggested by the National Institute on Aging (2018), including the use of brochures, community
contact introductions (CCI), presentations, event tables, 1:1 interactions and activity events. We
examined the success of each method of recruitment in two recruitment waves based on the number
recruited in relation to the number of hours spent on that recruitment method. Of the 119 people
that were screened, 47% were enrolled in the study. The top three recruitment methods found to be
successful included activities [4 hours per person (HPP)], CCI (5.6 HPP), and 1:1 interaction (7.5 HPP).
Additionally, there was a decrease in the hours per person for 1:1 interaction which we propose was
related to relationships forming between the facility and recruiters.

HENRY HALL ATRIUM 029
Safe Sleep
Presenter: Jenna Czart
Mentor: Kelli Damstra, Nursing

Many parents and healthcare providers are either unsure of safe sleep practices or fail to implement
them. This presentation will display safe sleep guidelines that are recommended by the American
Academy of Pediatrics.

HENRY HALL ATRIUM 033
Development of a Method for Detection, Characterization, and Quantitation of Streptococcus mutans via Capillary Electrophoresis
Presenter: Olivia Gordon
Mentor: Andrew Lantz, Chemistry

Streptococcus mutans is a common bacterium found in the human mouth. It is most notably
responsible for the initiation of cavity formation due to its production of acidic compounds as waste.
Here, we report the development of a rapid method of identification and quantitation of S.
mutans via different modes of capillary electrophoresis (CE), chiefly capillary zone electrophoresis
(CZE) and capillary isoelectric focusing (CIEF). CZE was used to obtain data to characterize the surface properties, electrophoretic mobility, and isoelectric point (pI) of *S. mutans*. CIEF was then applied to focus and separate the bacteria by their pI in such a way that it will be detectable amongst other cells and molecules within a salivary sample such as *Streptococcus sobrinus, Lactobacillus acidophilus, Lactobacillus casei*, or *Actinomyces viscosus*. The CIEF method was optimized by varying factors such as ampholyte concentration, use of ampholyte additives, segmental injections, and preparation procedures.

HENRY HALL ATRIUM 053

**Phosphomimetic Mutants of Nato3 and Dopaminergic Neuron Related Gene Expression**

Participants attending 9:00 AM - 10:00 AM, 4:00 PM - 5:00 PM

Presenters: Sofia Hessler, Maxwell Okros

Mentor: Merritt Delano Taylor, Biomedical Sciences

Midbrain dopamine neurons (mDA) can arise from the floor plate of the midbrain and are responsible for the symptoms of Parkinson’s disease as the cells degenerate. One gene involved in dopamine neurogenesis is the basic helix-loop-helix transcription factor Nato3. Previously collected lab data has shown greater upregulation in mDA related gene expression by some phosphomimetic (PM) Nato3 variants compared to the wild type of Nato3 in vivo. We hypothesized that PM Nato3 mutants would drive the expression of genes associated with mDA neurogenesis in cell culture as well. Our data show that the effect PM-Nato3 condition on dopamine gene expression in the SN4741 cell line is variable and may be regulated by incubation period in culture- studies are currently testing this. PM Nato3 regulation of these genes will further insight into transcriptional regulation of neurogenesis and/or neuroprotection and the development of clinical therapeutics for Parkinson’s disease.

HENRY HALL ATRIUM 055

**Language regard in Michigan’s Upper Peninsula: Perceptual Dialectology through the Mental Maps of Nonlinguists**

Presenter: Karissa McFarlane

Mentor: Wil Rankinen, Communication Sciences and Disorders

As a geographic region and speech community, Michigans Upper Peninsula (UP) is well positioned to examine language regard using hand-drawn mental maps to determine how the general population perceives dialect differences inside and outside their community. The present study examines the geographic distribution of perceived Finnish-ness, Yooper-ness, and Canadian-ness categories across the UP. This 92-participant study, stratified by four UP counties, reveals that perceived Finnish-ness and Yooper-ness are focused on the UPs northwestern regions, while Canadian-ness shows variation loosely focused on the eastern UP.
Structural Allometry of Three Locally dominant Deciduous Tree Species in West Michigan
Participants attending 9:00 AM - 10:00 AM, 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM
Presenters: Anne Eckman, Brendan May, Joshua Stayman
Mentor: Gary Greer, Biology

Trees in a cold-temperate forest require stem strength sufficient for self-support to maximize canopy height and width while resisting stresses imposed by wind and snow. We compared optimization of self-support of three tree species native to Western Michigan (Acer saccharum, Fagus grandifolia, and Quercus rubra) with their dominance in local forest stands. Optimization of self-support was investigated by analyzing branch architecture per the Uniform Stress and West-Brown-Enquist scaling models. Data were collected from thirty trees per species. Height and d.b.h. were measured in the field. Branch diameters and angles of the first three nodes were measured from scaled photographs. The influence of neighboring trees was assessed by measuring the d.b.h. and distance of the nearest trees. Our results are consistent with structural optimization as an important factor in local dominance which is mitigated by the effects of neighbors.

HENRY HALL ATRIUM 094
Investigating the Toxicity of Nonylphenol in Juvenile Faxonius propinquus Crayfish
Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM
Presenters: Marlee Busalacchi, Natalie Rizza, Haley Ryba, Collin Trainor
Mentor: Daniel Bergman, Biomedical Sciences

Nonylphenol (NP) is a commonly used chemical that accumulates in aquatic environments and negatively impacts aquatic life. Previous studies in our lab have shown that NP can reduce olfaction, reproduction, and molting frequency in adult crayfish. Although lethal doses of NP in adult crayfish have been determined, no studies have determined the concentrations in which NP is lethal to juveniles. We hypothesized that juveniles are more susceptible to the effects of NP than adults. Male and female juveniles weighing 3.00g or less were isolated for 2 days prior to a 24-hour exposure to various concentrations of NP. Results indicate that 100% of juvenile crayfish exposed at 0.05 ug/L survived, 75% survived at 0.1 ug/L, 62.5% at 0.125 ug/L, and 0% at or above 0.15 ug/L, indicating that lethal effects occur at very low concentrations. Further studies will investigate the effects of NP on juvenile physiology and could offer insight for other aquatic species exposed to NP during their lifespans.

KIRKHOF CENTER GRR 020
Eating Disorders in the LGB Community
Research has shown that members of the LGB community are diagnosed with eating disorders at an alarming rate. Yet, little research has been done to show how eating disorders affect the LGB community. By examining YouTube videos from a few individuals in the LGB community with eating disorders, along with analyzing their comment sections, I was able to examine how eating disorders affect the LGB community in a specific way. Anticipated findings include white privilege allowing for these YouTubers to have a voice in a muted group of individuals. This study is important because it helps to show how individuals in the LGB community with eating disorders are dealing with their mental illnesses.

KIRKHOFF CENTER GRR 031

**Language in Menstrual Health Management**

Presenter: Nokomis Clarey-Schultz
Mentor: Leifa Mayers, Women, Gender, and Sexuality Studies

My research project is looking at the implicit racial and gender-based language used by various international organizations to describe menstrual health management. The purpose of this research project is to understand how international organizations use more or less inclusive language when speaking about menstrual health and those who menstruate. I will apply context analysis to statements and campaigns from international organizations to code for language that is implicitly racialized and/or gendered. This research is important because language can drastically change the message that an organization is trying to send to those who are affected by particular social and economic issues. Menstrual health management is something that affects people of many gender and racial identities and socioeconomic backgrounds, and the way that we speak about menstruating bodies is vital to health, safety, and development.

KIRKHOFF CENTER GRR 032

**Exploration of the Effectiveness of NaProTechnology in Women’s Healthcare**

Presenter: Cecilia Cerven
Mentor: Kelli Damstra, Nursing

Many women today struggle with abnormal menstrual cycles and the painful symptoms of reproductive disorders. The standard approach to treatment of irregular menses, PCOS, endometriosis, hormonal abnormalities, PMS, and other conditions is the prescription of a pill for symptom management. A relatively new and innovative method to fertility care is drawing the attention of healthcare providers and prospective clients alike, which offers an alternative approach. NaProTechnology, or Natural Procreative Technology, works with Fertility Awareness-Based Methods (FABMs) to detect and treat various reproductive disorders. This project will assist in bridging the gaps in education and overall awareness of treatment options available in women's healthcare. It will assess the risks and benefits of both natural and artificial approaches, review statistical data on relevant research, and evaluate the holistic impact NaProTechnology and FABMs have on clients who utilize it.
Closing the Gap Between Generations
Presenter: Gabrielle Poeder
Mentor: Jing Chen, Psychology

Older and younger generations are often living in separate spaces in our society. In this poster, I will discuss the factors that may cause such separation, the effects living alone can have on older adults, and the benefits that can result from creating relationships between the different generations through intergenerational volunteering programs. I will also address how we can bridge the gap between these generations and propose an intergenerational program that can help ease the aging process, benefit younger individuals, and create a more integrated society.

Early Cell-Cell Coupling Impairs Stem Cell Retention when Co-cultured with Hypoxic Cardiomyocytes
Presenter: Jack Tietema
Mentor: David Geenen, Physician Assistant Studies

Rationale: Bone marrow-derived mesenchymal stem cells (BM-MSC) induce beneficial effects in the heart following hypoxia but loss of these cells would diminish their effect. We hypothesized that coupling between BM-MSC and cardiomyocytes (CM) through gap junctions (GJ) during hypoxia may play an important role in stem cell retention. Methods and Results: Both human and murine BM-MSC express connexin43 (Cx43), a critical protein in the formation of GJ. FACS analysis revealed that BM-MSC exhibited a significant reduction in apoptosis (3-5 fold; p<0.05) in co-culture with hypoxic CM and the presence of a GJ inhibitor compared to hypoxic co-cultures in which the inhibitor was not present. Conclusion: Stem cell loss following co-culture with hypoxic CM represents a novel GJ-mediated mechanism that can be attenuated by inhibiting GJ formation. Furthermore, the expression of Cx43 in human BM-MSC suggests that GJ may also be an important target in the efficacy of cell therapy for humans.

Synthesis of β-c-glycosidic Ketones from Unprotected Sugars and Their Use in Aldol Condensations with Hydroxymethylfurfural
Presenter: Jon Chiaramonte
Mentor: Dalila Kovacs, Chemistry
C-glycosides are a growing interest in synthetic chemistry for their use in the pharmaceutical industry as important drug pharmacophores and their potential use in chemical industry as surfactants. Previous literature describes the synthesis of C-glycosides using many steps and toxic reagents, often involving the use of protecting groups. The extra steps result in lower yields, require more reagents and produce more waste, which limits the environmental sustainability of the overall synthesis. This study aimed to reproduce the literature synthesis of β-C-glycosidic ketones from acetylacetone and monosaccharides without the use of protecting groups. These ketones were further reacted in aldol condensations with non-enolizable aldehydes. We probed the scope of this reaction with unprotected disaccharides, and reacted the products with hydroxymethylfurfural, a renewable bio-based platform molecule, in aldol condensation reactions. The results of our investigation will be presented.

KIRKHOF CENTER GRR 069

**Linking Vegetation Change with Functional Traits in a Changing Arctic**

Presenter: Katlyn Betway  
Mentor: Robert Hollister, Biology

The Arctic is warming more than twice the rate of the global average. Plant responses to warming have been documented in northern Alaska for decades and have shown that graminoids, deciduous shrubs, and evergreen shrubs are increasing in cover while forbs are decreasing in cover or remaining constant depending on the location. To better understand why growth forms are responding differently, nine functional traits were measured for 13 species at three sites in northern Alaska. Canonical correspondence analysis reveals that species increasing in cover are associated with high photosynthetic capacity and plant height. Species decreasing in cover are associated with leaf dry matter content. These traits closely correlate with relative growth rate, suggesting that more efficient species will dominate the landscape over time. These shifts in community level trait values can affect ecosystem processes such as carbon cycling and have the potential to affect the Arctic's carbon budget.

KIRKHOF CENTER GRR 070

**Synthesis & Characterization of Potential Pharmaceutical Analogs of a GVSU Lead Compound: An Investigation of Antibiotic & Anti-tumor Activity**

Presenter: Nicole Horne  
Mentors: Bill Schroeder, Laurie Witucki, Chemistry
In support of ongoing anti-microbial & anti-tumor research, analogs of a GVSU lead compound, a derivative of the known telomerase inhibitor BIBR1532, were synthesized. These compounds were submitted for biological analysis to determine pharmacological activity toward the discovery of either an antibiotic that can resist bacterial enzymatic degradation or a chemotherapeutic molecule that can destroy tumor cells without increasing toxicity. The anti-microbial interest in these compounds was based on the fact that they are non-penicillin-based antibiotics and display a broad range of efficacy against targeted bacteria, including C. diff & MRSA, with minimal toxicity. These compounds were made via nucleophilic acyl substitution chemistry, where various substituted anthranilic acid molecules were coupled via a condensation reaction with either commercially available or synthetically made acid chlorides. Characterization of the compounds was accomplished by TLC, IR, & ¹H-NMR analysis.

KIRKHOF CENTER GRR 077
The Healing Power of Music
Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM
Presenter: Kathleen Szczesny
Mentor: Barbara Hooper, Nursing

The value of holistic and individualized care in honoring a patient’s story and promoting their quality of life is of the highest importance when providing nursing care. Nursing is more than just a profession, it is an art that is consistently changing and adapting, requiring critical and creative thinking to deliver high quality, safe care that is evidenced-based. Nurses must continuously seek innovative ways to enrich lives and enhance the healing process through interventions strongly supported by research. The purpose of this project was to explore music as an alternative form of medicine that can be utilized as a therapeutic intervention in nursing care. The project included conducting a literature review of pertinent articles and studies in preparation for writing a research paper. The paper focuses on the history of music therapy, using music in healthcare settings, music’s impact on different patient populations, and how nurses can implement music to improve patient outcomes.

KIRKHOF CENTER GRR 111
The Impact of Study Abroad on Cultural Competence
Presenter: Megan Minix
Mentors: Susan Strouse, Melodee Vanden Bosch, Nursing

The purpose of this research was to assess the impact of study abroad on nursing students’ perspectives of cultural competency. This study used a survey tool to assess demographics and cultural competency before and after a nursing study abroad to Ghana. Students completed pre- and
post-trip surveys. A modified Giorgi method was used to analyze qualitative data and a one-tailed, paired t-test to analyze quantitative data. Themes identified included 1) using a theoretical approach prior to the trip, 2) developing an application of cultural competency post-trip, and 3) gaining a better understanding of own culture and nursing universality. Cultural competency scores significantly increased post-trip. The findings suggest that study abroad increases nursing students’ perspectives about providing culturally competent care. Students gained experience and skill related to cultural competency prior to nursing practice; therefore, study abroad should be utilized in nursing curricula.

KIRKHOFF CENTER GRR 114
**Gender-Based Differences in Eating Disorder Presentation: A Rapid Systematic Review**
Presenter: Matthew Smith
Mentor: Lori Houghton-Rahrig, Nursing

Problem. Traditionally, eating disorders (EDs) have been perceived as a female-specific issue. This notion has been influenced by the research of predominantly female populations, which has guided the design of diagnostic criteria, screening tools, and treatment methods. Male clinical presentation of EDs varies from female-derived norms, suggesting that disparities in screening and treatment may exist.

Purpose. The purpose of this systematic review is to identify sexually dimorphic ED symptoms. Though the identification of varying traits, ED screening tools and treatment methods can be reviewed for validity in male populations. Search Strategy. Databases searched include CINAHL, PsychINFO, PubMed, and the Web of Science. Results. The database search resulted in 1,593 articles; 34 articles met eligibility criteria. Significant differences were found in global ED pathology, body image perceptions, exercise behaviors, and physiological manifestations of EDs between genders.

KIRKHOFF CENTER GRR 115
**A Discourse on the Gendered State of Healthcare**
Presenters: Sarah Battiston, Anna Lehouiller
Mentor: Debra Robles, Nursing

Let’s get real, gender expectations still permeate societal roles, and healthcare isn’t immune. The Role Congruity Theory explains the issues that arise when the societal roles prescribed to an individual do not align with the cultural stereotypes of the individuals chosen occupation. This theory gives us insight to the masculine characteristics expected of physicians and feminine characteristics expected of registered nurses, and what occurs when there is a “lack of fit” between gender stereotypes and stereotypes these occupations. This paper strives to begin a discourse of the issues regarding gendered stereotypes of these two careers, how these can lead to gender discrimination against female physicians and male registered nurses, and how these roles affect relations between these two fields. After revealing these issues and their root causes, it will attempt to provide solutions to minimize the gender roles assigned to these two fields and promote patient-centered team care.
Social Movements: An Analysis of the Youth Climate Strike
Presenter: Hannah Pierson
Mentor: Jennifer Stewart, Sociology

Youth dominated social movements have been occurring throughout the last several decades, however recently they have been taking the world by storm. From the Civil Rights Movement and Anti-Apartheid to March for Our Lives and Friday’s for Future, these organizations have covered many bases and involved themselves in activism to new degrees. This research project is designed to understand and apply the social movement framework to a specific organization. Therefore, the goal is to determine if The Youth Climate Strike organization is, in fact, a social movement. If the Youth Climate Strike is a social movement then what are the possible effects this organization can have? Alternatively, if this organization is not a social movement then how can it become one? With these questions in mind, identifying this organization as a social movement or a potential social movement can educate other organizations on how to do so, while also aiding in drawing attention to this group.

Linking CO2-flux with Tundra Vegetation
Presenter: Mackenzie Lift
Mentor: Robert Hollister, Biology

The Arctic climate is rapidly changing and perhaps the most impactful ecosystem change is the shifting balance between photosynthesis and respiration towards respiration. Here we correlated CO2-flux data generated from experimentally warmed and control plots established by the International Tundra Experiment (ITEX) at the dry heath tundra in Utqia!vik, AK with several abiotic and vegetation measurements conducted on the same plots. We found significant correlations between the vegetation and CO2-flux measurements. Linking the change of CO2-flux to the changes in tundra vegetation will provide a deeper understanding of the impacts of climate change on the Arctic and allow for more accurate predictions of future carbon dynamics.

Impact of Cell Density on Cx43 Expression in Endothelial Cells
Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM
Presenters: Madison Goen, Kyle Morrison
Mentor: David Kurjiaka, Biomedical Sciences

Consumption of omega-3 fatty acids benefits the cardiovascular system by reducing blood vessel inflammatory responses. Our recent work showed omega-3 fatty acids decrease connexin 43 (Cx43) expression in cultured endothelial cells after 1 day. Our interest in Cx43 was as marker of inflammation as omega-3 fatty acids are strongly implicated as anti-inflammatory agents. Localized inflammatory responses drive the growth of the atherosclerotic plaques responsible for a majority of
cardiovascular diseases. Anything that affects the inflammatory response will affect the growth (and stability which is also important) of those plaques. This poster will summarize current knowledge of atherosclerosis and inflammation as well as the impact of omega-3 fatty acids on inflammation.

KIRKHOF CENTER GRR 151

The Effect of Frenectomy Procedure on Breastfeeding Self-Efficacy
Presenter: Mary Chenge
Mentor: Kelli Damstra, Nursing

Structural restrictions from tongue-tie are associated with altered sucking and decreased self-efficacy in breastfeeding mothers. Frenectomy is a procedure to correct tongue-tie by detaching the frenulum. There is a need to review the evidence regarding the effect of tongue-tie release on maternal breastfeeding self-efficacy. This review aims to examine the effect of frenectomy on a mother’s confidence in breastfeeding using the BSES-SF tool. Database searches were conducted in PubMed and CINAHL. Keywords: “Frenectomy” AND “Breastfeeding self-efficacy.” Exclusion criteria: non-English studies. Evidence suggests that frenectomy is associated with improvement in breastfeeding self-efficacy and nipple pain in the short-term. The BSES-SF tool is an excellent measure of maternal breastfeeding self-efficacy following a frenectomy procedure. To improve maternal self-efficacy, clinicians need to assess tongue-tie in infants and recommend frenectomy procedure.

KIRKHOF CENTER GRR 163

Alternative Reproductive Tactics in Lake Michigan Populations of Invasive Round Goby (Neogobius melanostomus): How Fish Increase Fitness by Doing Less
Presenter: Alex Florian
Mentor: Charlyn Partridge, Annis Water Resources Institute

Understanding the reproductive biology of invasive species is an important step in managing populations. Yet little is known about the reproductive strategies of invasive round goby (Neogobius melanostomus) in Lake Michigan. Fertilization in round goby occurs externally in nests guarded by “paternal” males. However, some males pursue alternative reproductive tactics (ARTs), where males sneak into a larger male’s nest and fertilize a portion of the eggs. We investigated how the proportion of round goby ARTs varies between sites. We caught 264 fish from 4 drowned-river lakes along Lake Michigan. We measured their color, morphology, and gonad traits to determine reproductive type. Our results suggest ARTs represent at least 20% of reproductive round goby males. As predicted, sneaker males had larger testes relative to body mass, and paternal males had larger accessory glands relative to mass. Our next step is to model how the proportion of ARTs in these populations may be impacting them.

KIRKHOF CENTER GRR 164

Using GIS to Analyze Graminoid and Shrub Composition Change from 1997 to 2017 at Atqasuk, Alaska
Presenter: Rebecca Daigle
Mentor: Robert Hollister, Biology
Shrubs are expanding across the Arctic due to longer growing seasons and rapidly increasing air temperatures. Likewise, graminoid height is increasing. Changes in community composition may impact critical feedback loops and result in trophic cascades. Here, we analyzed vegetation cover change at a long-term research site in Atqasuk, Alaska. We compared cover across forty-eight, one-square-meter plots between 1997 and 2017. Shrubs and graminoids increased significantly over time, while bryophytes decreased over time. Other functional groups were inconsistent or showed no trend. We mapped the shrub and graminoid vegetation change in order to examine cover trends within the context of the surrounding landscape. Future studies may examine the shrub and graminoid change at Utqiagvik, AK.

KIRKHOF CENTER GRR 165

**Annual Veg Change on the ARCSS Subplots at Atqasuk and Utqiagvik**

Presenter: Jacob Harris  
Mentor: Robert Hollister, Biology

This research describes changes in plant cover in the landscapes near Atqasuk and Utqiagvik, Alaska. In each location 30 plots distributed in a matrix across the landscape were sampled annually from 2010 to 2019. Plant cover was classified into eight functional groups (deciduous shrubs, evergreen shrubs, forbs, graminoids, bryophytes, lichens, litter, and standing dead). In Atqasuk, graminoids and litter have increased in cover while bryophytes, lichens and standing dead have decreased in cover. In Utqiagvik, graminoids and leaf litter have increased in cover while bryophytes and standing dead have decreased in cover. Graminoid cover increases at both sites appear to be driven by moisture inputs and air temperature. We anticipate changes in cover, especially increases in graminoids, will continue as the region warms.

BEGINNING AT 10:00 A.M.

HENRY HALL ATRIUM 042

**The Impact of Vaccination on Grand Rapids Public Schools’ Students**

Presenters: Jeremy Abreo, Kayleigh Eder, Jordyn Francis  
Mentor: Kelli Damstra, Nursing

Central Focus: The focus of this paper is to analyze the number of children vaccinated in the Kent County School District. After determining the percentage of vaccinated children, we plan to implement an intervention to promote vaccination education to parents in the Grand Rapids area as well as increase awareness of the detrimental complications of refusing vaccinations. We are going to interview administrators in the school districts in Kent County, along with school nurses and Primary Care Providers to determine what they believe the issues surrounding the vaccination rates in this area are. After obtaining this information, we are going to create an intervention to promote awareness of the need for vaccinations in the form of an educational session, handout, or pamphlet.
Higher rates of vaccination amongst school-aged children provide protection not only for the recipient, but for the student population and society as a whole.

HENRY HALL ATRIUM 086

**Diagnosing Short-Term Memory Scanning Using Systems Factorial Technology: A Conceptual Replication**

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM

Presenters: Jakob Berg, Lola Erfourth, Tylor Kistler, Jenna Lester, Elliot Perpich, Monica Van Til

Mentor: Mario Fific, Psychology

Townsend and Fific (2004) published an influential short-term memory (STM) study in which they observed individual differences in serial and parallel STM scanning. The authors employed systems factorial technology — a novel methodology that provides strong diagnostic tests of cognitive structuring—and presented a new method of manipulating probe-to-memory item processing speed for memory loads (N=2). Three variables were manipulated in this experiment: number of processing elements (N=2), phonemic dissimilarity of a target to the particular memorized item (high, low), and duration between the memorized set and a target (short, long). In the original study, 10 subjects each participated in 20 sessions. The present study serves as a conceptual replication in which two-hundred subjects each participated in 1 session and a novel memory load condition was included. Results contributed converging evidence in testing serial/parallel processing in short-term memory scanning.

HENRY HALL ATRIUM 095

**Modulation Effect of Picrotoxin in the GABA(A) Receptor Ion Channel**

Presenter: Rose Lizzo

Mentor: Agnieszka Szarecka, Cell and Molecular Biology

CYS-loop receptors, e.g. GABA(A), are involved in neurotransmission and belong to a large family of diverse proteins involved in cognitive and neurological functions. GABA(A) receptors are drug targets for anxiety, depression, psychosis, and anesthesia, but the mechanisms of action of these drugs are poorly understood. In this project, we use Normal Mode Analysis to study modulatory effects of picrotoxin (PTX) on human GABA(A) receptors using its cryo-EM structures. Our data shows that neither GABA nor PTX binding affects the global twisting mode. We identified modes 10, 11, 18 and 30 that are affected by either GABA or PTX and GABA binding suggesting they are involved in the gating modulation mechanism. Our data also shows that binding PTX alone does not affect modes 10 and 11 that involve an asymmetric distortion of the extracellular domain and GABA binding pockets.

HENRY HALL ATRIUM 097
ERK1/2 do not Phosphorylate Proteins in Mitochondria and Myofilaments
Presenter: Tanner Napierala
Mentor: Ruijie Liu, Biomedical Sciences

Heart disease continues to be the most prevalent health issue in the United States. Previous studies have demonstrated the cardio-protective benefit of an increase in extracellular signal regulated kinase 1 and 2 (ERK1/2) activity in mice. In this study, genetically modified mice with knockouts of both the DUSP6 and DUSP8 genes (DKO) were used to study whether increased ERK1/2 phosphorylation in DKO mice changes the expression of these death-related proteins. We found out the increase in ERK1/2 phosphorylation mainly stayed in cytoplasm and the expression levels of BCL-2 and Bax were not altered. We also investigated whether myofilament proteins could be the phosphorylation targets. Our data indicated that there was no significant difference of myofilament protein phosphorylation between wild type and DKO mouse hearts. In conclusion, our data suggest that the protective role of ERK1/2 in the heart doesn't influence the phosphorylation of either mitochondrial or myofilament proteins.

Psychological Distress in General Undergraduate Students and Baccalaureate Nursing Students
Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM
Presenter: Kersten O'Brien
Mentor: Katherine Moran, Nursing

Background/Significance: Psychological distress in undergraduate college students is a significant concern in the U.S. Many stressors, such as academics and finances, are associated with high levels of reported stress, depression and anxiety. Nursing students face additional stressors, such as meeting program requirements, practicing in clinical environments and preparing for their licensure exam. Purpose: The purpose of this review is to describe psychological distress levels in baccalaureate nursing students compared to general undergraduate students and what interventions help relieve student distress. Methods: A literature review was conducted using CINAHL and PubMed databases. Findings: While general undergraduate college students report high psychological distress levels, higher levels have been identified in nursing students. Thus, interventions such as mindfulness techniques, physical activity, and group therapy should be promoted by educators to produce successful nurses.

Characterization of Developmental Changes in Central Nervous System Histaminergic Neurons in Drosophila
Presenter: Sisi Hon
Mentor: Martin Burg, Biomedical Sciences

Neurotransmitters have been studied in the central nervous system (CNS) of D. melanogaster, which includes identifying when cells first synthesize the neurotransmitter during nervous system development. Histamine is a neurotransmitter that has not been studied as extensively as other
biogenic amines with regard to cell number changes throughout CNS development. Identifying when cells develop the ability to synthesize histamine will enable a better understanding of changes that histaminergic cells undergo during development. An immunofluorescence whole-mount procedure was performed to detect histaminergic cells in intact CNS dissected from flies at 24 hr intervals throughout larval and pupal development. The specimens were examined using confocal microscopy to obtain a 3-dimensional image of histaminergic cell locations and axonal projections. Results indicate a conservation of cell numbers in the larval stages followed by significant changes occurring during pupal development.

KIRKHOF CENTER GRR 019

The Language Behind Victim Impact Statements
Presenter: Isabel Dowell
Mentor: Leifa Mayers, Women, Gender, and Sexuality Studies

Survivors of sexual assault are given the opportunity to provide a victim impact statement in front of their abusers in court. Former Michigan State University gymnastics doctor, Larry Nassar, has 204 statements against him. These statements give survivors the power they need to resist any assumptions made about them before, during, and after the assault; however, in what ways could they also be endorsing these assumptions? For this research, I have randomly selected a sample of statements from the unnamed victims of the People of the State of Michigan v Lawrence Gerard Nassar case in order to understand how the language used in the statements both resists and reinforces the construction of the “ideal” victim.

KIRKHOF CENTER GRR 090

Democratic Governance and Economic Growth: An Evaluation of Causality and the Case for Economic Freedom
Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM
Presenter: Jordan Pattison
Mentor: John Constantelos, Political Science

The current economic growth paradigm often emphasizes the role of democratic governance as a primary catalyst of positive outcomes. Despite this, a number of states with low levels of political rights and civil liberties have experienced strong economic growth as measured by positive changes in GDP per capita. To effectively evaluate the role of democratic governance on economic outcomes, it is necessary to control for the effect of other factors conducive to economic growth. This project empirically evaluates the role of political rights and civil liberties on economic growth by constructing multivariate models that consider the individual effect of democratic governance, economic factors, and economic freedom. It is demonstrated that democratic governance does not correlate with economic growth when controlling for economic factors and varying degrees of economic freedom. Importantly, economic freedom is found to be a primary factor that determines economic growth outcomes.

KIRKHOF CENTER GRR 092
Predator Odor Stress on Stress and Metabolic Endocrine Outcomes in Male and Female C57BL6/N Mice
Presenters: Morgan Block, Katie Wilk
Mentor: Elizabeth Flandreau, Psychology

It is known that the brain and gut ‘talk’ to each other, which is important for both physical and mental health as shown by associations between metabolic syndrome and mental illness in humans. Neuropeptides found in both the brain and gut are active in this communication and may mediate links between stress, metabolism, and psychopathology. This study aims to determine whether single exposure to predator odor is able to produce long-term changes in the endocrine system as measured by plasma concentrations of the “stress hormone” corticosterone and “hunger hormone” ghrelin. Male and female mice were exposed to one hour of predator stress with blood collection 48 hours, 7 days, or 14 days later to assess concentration of the hormones. Body weight and food intake were also recorded throughout the study to determine the impact of stress on metabolic efficiency. Results from this study are important to better understand how stress can lead to both metabolic syndrome and/or mental illness.

Statistics Activity Generator
Participants attending 10:00 AM - 11:00 AM
Presenter: Nicholas Rozema
Mentor: Bradford Dykes, Statistics

My project is an automated generator of activities, assignments and exams for introductory statistics classes and other classes covering statistical concepts (e.g., economics and sociology). The generator was created in R, a statistical computing language, and implemented as a web app using R’s Shiny package. Users can either provide their own dataset or go with the app’s default dataset and then choose questions or sets of questions automatically tailored to the chosen data. These questions will then be output neatly in the user's preferred format.

Analyzing the Role of a Protein Downregulated After Induction of Filamentous Growth in Candida Albicans
Participants attending 10:00 AM - 11:00 AM, 2:00 PM - 3:00 PM
Presenter: Jazmine Vasquez
Mentors: Ian Cleary, Derek Thomas, Biomedical Sciences
Candida albicans is a commensal fungus, habitually living with its human host; however, it has the ability to cause invasive infections making this organism opportunistic. C. albicans is the fourth most frequent cause of nosocomial infections affecting a vulnerable immunocompromised population. C. albicans exhibits different morphologies including yeast, pseudohyphae, and hyphae. The varying morphological potential of this organism is a virulence trait. Because of this, research has focused on what drives and impedes morphological switching. During a filamentation assay, a novel observation pertaining to a subgroup of proteins being downregulated early after germination was made. Here, we examine the effect of one of these proteins in hypha inducing media to determine if it will have an impact on virulence. With the conditions tested thus far, no significant impacts on morphology have been observed. However, effects on virulence have been observed.

KIRKHOFF CENTER GRR 172

Landscape Effects and Changes in Permafrost Depth in Atqasuk, Alaska
Presenter: Hannah Clarida
Mentor: Robert Hollister, Biology

Thaw depth was measured in a tundra ecosystem in Atqasuk, Alaska. This project focuses on the Atqasuk dry site which has been studied to understand the impacts of experimental warming on the tundra ecosystem. We were interested in how the spatial distribution of plots influences thaw depth measurements. The site has 48 plots. Thaw depth was measured in mid-August from 1996-2019. ArcGIS was used to interpolate the results of each year’s thaw depth and estimate the effect of the landscape on thaw depth. The average thaw depth was 110 cm across all plots and all years. There was significant variation between years but no clear trend over time. Experimental warming had no impact on the thaw depth. There was significant variation between plots, but these differences were not consistent across years. This study shows the depth of thaw is dynamic and difficult to predict over time and across the landscape.

BEGINNING AT 11:00 A.M.

HENRY HALL ATRIUM 019

From the Dinner Pot to Smoking Pot; How a Better Understanding of Cannabidiol in Crayfish could Alleviate Anxiety and Modulate Hunger
Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM, 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM
Presenters: Cole Richter, Christopher Timmer, Madison Zielinski
Mentor: Daniel Bergman, Biomedical Sciences

One of the most prevalent mental disorders in the US is anxiety. One method of treatment is the use of SSRIs which allow for increased activation of serotonin (5-HT) receptors. Cannabidiol (CBD) is a cannabis derived compound which has been shown to decrease anxiety also by activation of 5-HT amine receptors. Unlike SSRIs, CBD has markedly fewer side effects. Decapod crustaceans, especially crayfish, have recently emerged as a novel organism to studying drugs of abuse. Our study of Faxonius propinquus crayfish aims to compare behavioral patterns between CBD and 5-HT. Firstly,
we aim to observe and measure change in aggression during fighting. Secondly, we aim to observe and measure differences in the amount of food consumed. Lastly, we aim to measure neural activity in tail tissue via action potential (AP) frequency after administration of CBD, 5-HT or agonist, and 5HT receptor blocker.

HENRY HALL ATRIUM 035

**Synthesis and Structure-Activity Relationship Study of Novel Nitrodiphenylurea Antibiotics**  
Presenter: Helen Bahlbi  
Mentor: Matthew Hart, Chemistry

According to the World Health Organization, tuberculosis (TB) is the leading cause of death by infectious disease. Tuberculosis is caused by the bacteria *Mycobacterium tuberculosis* and occurs globally. Additionally, in 2017, TB was reported in all 50 states. Due to the scope of TB, strict observation of patients is required to ensure adherence to the current drug regimen. However, most reported cases are in developing countries where proper care is difficult. With the emergence of multidrug-resistant TB exhibiting resistance to current treatments, novel antibiotics are needed. Recently, our lab discovered a family of diphenyl ureas that exhibit antimicrobial activity against several bacterial strains, including *Mycobacterium*. Based on our lab’s previous results, we have synthesized several diphenyl urea derivatives to examine their structure-activity relationship. Herein, we report the synthesis of the diphenyl ureas with varying nitro positions, chain-lengths, and sites of variation.

HENRY HALL ATRIUM 043

**Exploring the Effects of Biases in Mark-Recapture Fish Abundance Estimation with Software Simulations**  
Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM, 4:00 PM - 5:00 PM  
Presenter: Christian Yap  
Mentors: James McNair, Carl Ruetz, Annis Water Resources Institute

Two-sample mark-recapture sampling is a common method used to estimate fish abundance. The idea is to capture and mark fish in an initial sample. The fish are then released to mix randomly with the whole population. A second sample is obtained, and the number of marked and unmarked fish is recorded. The Chapman estimator uses the number of fish marked in the first sample, the total number of fish captured in the second sample, and the number of recaptured fish to estimate abundance. The assumptions are: 1) the population is closed, meaning no immigration/emigration, and births/deaths occur, 2) all fish are equally vulnerable to capture during each sample, meaning marking does not change fish behavior, and 3) marks are not lost/overlooked. Violations of the assumptions happen frequently and examining bias when a combination of assumptions are violated is difficult. Therefore, we created a software that lets users simulate different violation scenarios and examine the resulting biases.
The introduction of a new animal to a social group can cause individual zoo animals to alter their behavior. In 2019, a male lion was successfully introduced to an adult female at John Ball Zoo, after previously being exhibited with her sister in 2018. A second, older male continued to be exhibited alone, alternating with the pair in the same enclosure. Our study objective was to compare differences in behavior between 2018 and 2019 for the female (“experimental” animal whose social group changed) and the solitary male (“control” animal whose social group did not change). We used Zoomonitor to record state behaviors (e.g., walk) in scans conducted every 30 seconds collected during 30-minute focal-animal observation bouts. These data provided both spatial and behavioral detail. The female lion showed increased activity in 2019 and shifted the focal point of her inactive behaviors. In contrast, the solitary male did not alter his behavior between years.
shown that the refugees who are coming to Grand Rapids have an existing fear of police from their home country which they have carried with them into the United States. This project brings together the Grand Rapids Police Department with individuals from the refugee population. It will incorporate efforts to build trust among the two groups by bringing the Grand Rapids Police Department into the surrounding refugee communities, along with trusted community partners, for a Q and A session. We hope that this will allow for the fostering of positive relationships between the two populations and build more cultural sensitivity within the Grand Rapids Police Department.

KIRKHOF CENTER GRR 013
Professional Preparation of Athletic Directors in the State of Michigan: Athletic Directors’ Perceptions and Experiences
Participants attending 11:00 AM - 12:00 PM, 4:00 PM - 5:00 PM
Presenter: Carly Livingston
Mentors: Jon Coles, Sally Ross, Movement Science

This study identifies professional preparation and qualifications of high school athletic directors (ADs) in Michigan. Many sport management students seek in a career in high school athletics thus it is important to understand how degree requirements in sport management align with the job of an AD. A 2019 job posting on the MIAAA website for an AD listed a need for a Master of Arts degree in school administration. Another posting sought a valid teaching certificate and 3 years of successful teaching experience and an administrative certificate. An article in Athletic Business examined the “evolving athletic director position” (Hoch, 2018) and identified management responsibilities that ADs must embrace. Through discovering educational and professional backgrounds for ADs in Michigan high schools, and by understanding what current ADs identify as requisite abilities to be successful in their jobs, sport management educators at GVSU can better prepare students for these positions.

KIRKHOF CENTER GRR 033
Use of Peer Instruction and TopHat in a Pharmacology Lecture: Observation of Students’ Engagement and Perception
Presenter: Hannah Espinosa
Mentors: Jing Chen, Psychology; Babasola Fateye, Biomedical Sciences

Different instructional practices can have different effects on student engagement and learning outcomes in a STEM course. The purpose of this study is to examine the differences in teaching practices and the engagement of students in two different sections of the same BMS course, one section with a traditional lecture style class while the other utilized an interactive online platform, TopHat, in tandem with lecture. This study also investigates the students’ perception of the usage of TopHat and whether peer discussions in the TopHat session will lead to better learning results. Data are currently being collected by observing five classes of each section of the BMS course using a coding protocol that characterizes the students’ and instructor’s time spent in the classroom. The CRISP survey will be administered at the end of observations to measure the students’ perception of TopHat. Final results will be presented at SSD in April.
KIRKHOF CENTER GRR 045

**Isolation and Purification of Lignin in Willow Wood**
Presenter: Nathaniel Dietlin  
Mentor: Dalila Kovacs, Chemistry

Currently increasing amounts of time and energy are spent in search for renewable resources with increasing focus on biomass. Of particular interest is the extraction and chemical ‘reforming’ of the lignin, a naturally occurring abundant organic polymer. If separated from cellulose and depolymerized, lignin could become a rich resource of chemicals. This project focuses on lignin separation from willow wood collected from GVSU agricultural project lot, and its purification. The lignin extracted from wood was analyzed via Fourier-transform infrared spectroscopy. By comparing the IR results from four different willow wood to available literature data, it was confirmed that lignin was isolated from willow wood and that further purification is required. A quantitative estimate of efficiency of lignin extraction from the four different types of willow wood ranges from 4.50% to 10.82% lignin by mass.

KIRKHOF CENTER GRR 071

**Connecting the Nano and the Macro: A Study of Pore Structure in Carbon Black Nanocomposites**
Participants attending 11:00 AM - 12:00 PM, 1:00 PM - 2:00 PM  
Presenter: Evangalene Dreyer  
Mentor: Richard Vallery, Physics

Positronium Annihilation Lifetime Spectroscopy (or PALS) uses the lifetime of the bound state of the electron and its antiparticle, the positron (positronium), to determine the pore size, a nanoscale property. By measuring the evolution of pore size as a function of temperature one can determine the phase. Additionally, a macroscopic property called Young’s Modulus affects how much the sample is capable of stretching when a known force is applied. Thus, by measuring the pore size and Young’s Modulus, it is possible to gain a better understanding of how alterations at the microscopic level (pore size) affect the macroscopic properties (Young’s modulus) of carbon filled PDMS polymers. For this study, Young’s modulus and pore size will be systematically measured in samples where the particle size is held constant and fraction of particle (relative to the polymer) is increased and where the volume of the sample occupied by the particles is constant but the particle size is changed.

KIRKHOF CENTER GRR 096

**Every day is Halloween: The Role of Fashion and Music in Goth Subculture**
Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM  
Presenter: Lucretia Dunlap  
Mentor: Abdullah Alrebh, Sociology
Goth subculture has been around since the 80s, first emerging as a reaction to the commercialized pop and rock scenes. This movement originated with the rebellious punk subculture of the West and United Kingdom. Very quickly, goth music and fashion were appropriated by other bands and magazines (Spracklen & Spracklen, 2014). Goth subculture has had massive effects on popular culture, influencing movies, various music scenes, and fashion styles. My research was motivated by a desire to contribute to the literature about goth subculture, with a focus on how those within the culture view the culture and their peers within it. During my study, I conducted a content analysis of interview transcripts. The purpose of my research was to understand how those within the culture define the term ‘goth’, how individuals are introduced to goth culture, whether there are different types of goths, and how different types of goths are categorized.

BEGINNING AT 12:00 P.M.

HENRY HALL ATRIUM 004

Using Protein Knockdown to Observe Loss of Function Phenotype of p53 in *Drosophila melanogaster*

Participants attending 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM
Presenter: Mikaela Berg
Mentor: Georgette Sass, Biology

Loss of function mutations in the p53 gene are frequently associated with a wide variety of cancers and the critical role p53 protein plays in cell cycle progression has led to its description as the Guardian of the Genome. The role of p53 in cell cycle regulation occurring during developmental processes in *Drosophila melanogaster* will be examined using genetic techniques to knockdown either the p53 RNAi or the p53 protein. Currently, we know some functional properties that p53 plays on imaginal disks in normal and in overexpressed circumstances on the imaginal disks. Imaginal discs are structures found in larval stages of insects that undergo rapid metamorphosis. The goal is to find and create novel phenotypes associated with loss of function of this protein in imaginal discs. In order to visualize this, experiment the use of Epi-Fluorescent Microscopy and Confocal Microscopy will be vital to our characterization.

HENRY HALL ATRIUM 025

Automated Conjecture Making: Domination on Planar Graphs

Presenter: Jose Garcia
Mentor: Taylor Short, Mathematics
A planar graph \( G = (V,E) \) is a graph that can be embedded in the plane, i.e. it can be drawn in the plane so that no edges intersect except at the vertices. A subset \( S \) of vertices in a graph \( G \) is called a dominating set if every vertex \( v \in V \) is either an element of \( S \) or is adjacent to an element of \( S \). The domination number of a graph \( G \) is the smallest cardinality of a dominating set; we denote the domination number as \( \gamma(G) \). Automated conjecture making is the process of having a computer generate conjectures. We investigate and find a bound for the domination number of planar graphs with the use of automated conjecture making.

HENRY HALL ATRIUM 030

**Colorizing Anatomical Specimens in the GVSU Plastination Lab**

Presenter: Allison Soffa  
Mentor: Timothy Strickler, Biomedical Sciences

In the early days of plastination (1980's) it was common to leave the plastinates with their natural color, usually a brown/gray after preservation with a formalin fixative. The first attempts at coloring plastinates included the use of the chemicals, eosin and merthiolate, but neither of these methods were successful in producing a permanent life-like color. Later on, colored epoxy and silicone were used with some success. The epoxy and silicone were able to carry pigments throughout the vascular system and into the capillary network to produce a life-like color. Attempts at coloring GVSU plastinates have involved acrylic based paint and oil-based paint diluted with Mineral Spirits. These and other possible techniques involved in creating aesthetically appealing plastinates and the increased educational value of colorized specimens will be discussed.

HENRY HALL ATRIUM 031

**Small Angle X-ray Scattering Characterization of BshC**

Presenter: Shea Siwik  
Mentor: Paul Cook, Chemistry

Bacillithiol (BSH) is the low molecular weight thiol produced by some pathogenic organisms such as *Bacillus anthracis*. The molecule helps detoxify the cell and has been implicated in resistance to drugs such as the FDA-approved fosfomycin. BSH is produced by three enzymes. The last enzyme in this pathway, BshC, is a cysteine ligase that attaches a cysteine to glucosaminyl malate, resulting in BSH. A crystal structure of BshC has been determined by Cook lab, which depicts BshC as a dimer via a coiled-coil domain with an overall dumbbell-shape. However, it has not been shown that BshC forms a dimer in solution. Small angle x-ray scattering (SAXS) data will be used to determine the overall shape of the protein in solution. Here we report progress on the purification of both wild-type BshC and a coiled-coil domain truncation of BshC and results from SAXS measurements. More structural information about BshC is necessary for rational drug design to help overcome fosfomycin resistance.

HENRY HALL ATRIUM 056

**Progress Towards the Structure of a Bacterially Expressed Snake Venom Metalloproteinase Inhibitor from the North American Opossum (*D. virginiana*)**

Presenter: Lauren Miling
Numerous mammalian species, including the mongoose, hedgehog, and opossum appear to be resistant to a variety of snake venoms. This resistance is conferred through two mechanisms: 1) the resistant animal displays a mutation in the receptor targeted by the snake’s toxin, and/or 2) the resistant animal contains serum proteins, that form non-covalent complexes that neutralize toxic components of the venom. One such protein, oprin, has previously been identified in the N. American opossum (*Didelphius virginiana*) as a snake venom metalloproteinase inhibitor (SVMPI). This work presents our efforts to insert the oprin gene into the bacterial expression vector pET28 using Gibson assembly in order to over-express and purify this protein. This recombinant protein contains a 6xHis-tag at the C-terminus to assist in purification. In addition, we will discuss evidence that the pET28-oprin construct can be successfully used to express the oprin protein.

**HENRY HALL ATRIUM 074**

**Structure-activity Relationship of Novel Diphenyl Ureas Targeting *Mycobacterium***

**Presenter:** Piper Burghduf  
**Mentor:** Matthew Hart, Chemistry

In 2017, the World Health Organization reported that 10 million people were infected with tuberculosis, 1.6 million of whom died. Tuberculosis is caused by a bacterium called *Mycobacterium tuberculosis*, which primarily infects an individual’s lungs. Unfortunately, failure to adhere to the long and arduous drug regimen has contributed to the emergence of antibiotic-resistant strains of *M. tuberculosis*. Therefore, the need for novel antibiotics is imperative to saving millions of lives. Our lab has recently developed a family of diphenyl ureas that exhibited increased antimicrobial activity toward *Mycobacterium*. Reported herein is the continuation of our previous research involving the synthesis of compounds with increased ester chain lengths and varying substituents on the phenyl ring. Compounds were confirmed using NMR spectroscopy and tested for antimicrobial activity using disk diffusion assays.

**HENRY HALL ATRIUM 082**

**Twiggy: An Osteological Reconstruction of a Skeletal Model’s Identity**

**Presenter:** Alexis Rausch  
**Mentor:** Gwyn Madden, Anthropology

Since the 1990s, GVSU’s Anthropology Department has housed the disarticulated hanging skeleton of an individual nicknamed Twiggy who was originally used as a medical model. Typically, little is known about individuals used as medical models, as is true in this individual’s case. To continue using these remains as teaching material, it is imperative that we understand more about their life. In alignment with post-processual archaeological theory, this project aims to reconstruct the life of one individual. In order to do so, a profile will be constructed for the individual by estimating traits such as age, sex, and stature. Their remains will also be analyzed for trauma, pathology, and non-specific indicators of stress. Further research will be done in order to understand the history of anatomical
model construction. In doing this, Twiggy will be able to reclaim their identity, as students are able to learn about their story in life and in death.

HENRY HALL ATRIUM 103

**Thing 1 and Thing 2 are in a New Zoo: Changes in Behavior of Amur Tigers Following Introduction to John Ball Zoo**

Presenters: Caitlin Gerke, Faith Hensley
Mentor: Jodee Hunt, Biology

Animals alter their behavior in response to changes in their environment such as alterations to their enclosure, social group, or husbandry routine. In 2018, two related, young adult Amur tigers (*Panthera tigris altaica*) were transferred to the John Ball Zoo (JBZ). The male siblings were given access to a spacious, wooded outdoor enclosure (area = 920 m²). We used Zoomonitor in 2018 and 2019 to conduct focal-animal sampling of the two males. We recorded state behaviors in 30 sec intervals of scan sampling, and all occurrences of event behaviors, both during 30 min sampling sessions. Our study objective was to compare patterns of behavior and enclosure use in 2018 (immediately after introduction to JBZ) and 2019 (one-year post-introduction). The two males initially used little of their outdoor space but expanded their spatial repertoire to include all areas of the enclosure by August 2018; this pattern of more expansive use of the enclosure continued into 2019.

KIRKHOF CENTER GRR 085

**Treatment Options for Traumatic Cervical Spine Injuries: A Review**

Presenter: Alec Carroll
Mentors: Natalie Laudicina, Chris Reed, Dawn Richiert, Melissa Tallman, Biomedical Sciences

Prompt medical and/or surgical intervention of cervical spine fractures is synonymous with good clinical outcomes. If not properly managed, these fractures can cause an array of neurologic complications ranging from radiculopathy to paralysis to, in severe cases, even death. The type of management for cervical fractures depends on the level and location as well as the presence of ligamentous injury as this can cause the instability of adjacent structures. In this study, the different types of treatment pathways for cervical fractures based on current medical standards were reviewed and evaluated in a cadaveric model. During dissection, significant scar tissue and metal rods were discovered in the nuchal region of a 77-year-old male cadaver. After review of current protocols and careful dissection we diagnosed this individual with a type III cervical spine fracture which was repaired through a C2-3 posterior cervical spine fusion with C2 fixation via pedicle lag screws.

KIRKHOF CENTER GRR 156

**Determination of Hdc Promotor Function in *Drosophila melanogaster* Using Transgenic Flies**

Presenter: Selina Ruiz Mendoza
Mentor: Martin Burg, Biomedical Sciences

*The Hdc gene of *D. melanogaster* encodes histidine decarboxylase, an enzyme that synthesizes histamine. The promoter region of the *Hdc* gene should play a role in controlling its expression. This
The project's goal is to examine Hdc promoter function using transgenic tools. A full promoter region (pHdc\(^{L}\)) or a shorter promoter region (pHdc\(^{S}\)) were separately combined with the Green Fluorescent Protein (GFP) gene to generate pHdc-GFP gene fusions that were used to generate transgenic flies. To examine pHdc\(^{L}\) expression, histamine immunostaining and GFP fluorescence in the nervous system was examined. Results indicate that the pHdc\(^{L}\) region functioned as expected. Examination of recently generated pHdc\(^{S}\)-GFP transgenic flies is being done to determine whether the Hdc promoter region remaining in pHdc\(^{S}\) is sufficient to induce expression as occurs using pHdc\(^{L}\), as molecular analysis suggests that Hdc expression may be incomplete using the pHdc\(^{S}\) fragment in a pHdc\(^{S}\)-GFP transgenic fly.

**BEGINNING AT 1:00 P.M.**

HENRY HALL ATRIUM 013

**A Global Team Approach to Advancing the Practice Doctorate in Nursing**

Presenter: Elizabeth Pohl  
Mentor: Dianne Conrad, Nursing

Given the complexities of healthcare today, advanced nursing practice leaders are needed to address person-centered and system issues in care delivery. The purpose of this presentation is to describe a global team’s efforts to engage international partners in identification of specific geographic healthcare needs, with the potential for development of practice-focused doctorate nursing leaders. An innovative project approach was used with U.S., Irish, and Saudi Arabian nursing faculty scholars to address advanced nursing practice that included assessment of current national trends in policy, education, practice, and development of recommendations for advance nursing practice while respecting cultural diversity. The presentation will describe the team’s efforts to foster global networking, collaboration, and sharing of expertise with international partnerships.

HENRY HALL ATRIUM 032

**Comparison of Branching Allometry between *Ginkgo biloba* and Several Native Michigan Trees.**

Participants attending 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM  
Presenters: Collin Fox, Noah Holkeboer  
Mentor: Gary Greer, Biology

*Ginkgo biloba* is the only extant species of the gymnospermous order Ginkgoales. Like angiosperms, ginkgo is deciduous with broad leaves and vessel tubes. However, unlike angiosperms, ginkgo possesses a long-shoot x short-shoot branching system, the latter producing most of the leaves, and open-dichotomous leaf venation. Given that branching reflects optimization of photosynthetic capture through structural support and hydraulic efficiency, we compared the degree to which these functions were optimized for ginkgo relative to three native species. DBH, neighbor density and size were measured in field and branch dimensions were measured from photographs and analyzed per Murray’s Law for hydraulic optimization and the Uniform Stress and Elasticity Models for structural optimization. Our results reveal differences in branch architecture between ginkgo and native angiosperms. These reflect differences in hydraulic versus structural optimization.
HENRY HALL ATRIUM 045

**Digital Cultural and Historical Preservation**

Presenter: Natalie Heacock  
Mentor: Mark Schwartz, Anthropology

The intent of this research is to demonstrate the use of photogrammetry and 3D scanning technology for the purpose of archaeological preservation and analysis. Projects presented in this research are digital 3D models of a stone tool artifact, shipwreck, and a historical building. Digital cultural and historical preservation is important for keeping an archive of artifacts and heritage sites, not only for the sake of analysis, education, and public availability, but in case of damage or loss to the objects in the future. This work shows that 3D models can be created through data acquisition, image processing, and the use of different software.

HENRY HALL ATRIUM 054

**Effects of Competition on the Diet, Behavior, and Physiology of Brook Trout**  
*Salvelinus fontinalis*

Presenter: Grayson Kosak  
Mentor: Eric Snyder, Biology

Changes in the diet, behavior, and physiology of brook trout as a result of competition with brown trout were investigated in a comparative study of an allopatric population of brook trout in Frost Creek and a population of brook trout living in sympatry with brown trout in Cedar Creek, Kent County, Michigan. Electrofishing samples and a controlled in-stream enclosure experiment were used in conjunction with blood samples and metabolism chambers to measure and observe feeding and resting behaviors, metabolic respiration, blood cortisol levels, population dynamics, and fitness metrics of brook trout in isolation vs. in competition with brown trout. Diet breadth and resource utilization of brook trout and brown trout were determined based on stomach contents collected via gastric lavage. Behavior, physiological stresses, and fitness metrics were deduced from observations and measurements obtained from both the wild and in-stream enclosures.

HENRY HALL ATRIUM 090

**TunnelWorld: A Robot Control Simulation Environment**

Presenter: Matthew Shan  
Mentor: Jared Moore, Computer and Information Systems

Robotic controllers must exhibit effective movements while also being robust to dynamic environments. A specific controller design challenge is the transition between different gaits. For
example, in legged systems, the transition from walking to running requires knowledge of the state of each leg to coordinate transitions among the legs preventing stumbling. From a software perspective, walking and running are different modes of operation. Successful transitioning is a difficult process and designing algorithms to identify modes and transition points is an ongoing challenge. In this work, we construct a simulation simplifying the mode switching problem from a legged robotics domain to a voxel-based tunnel world. Digital agents navigate towards a goal while adjusting their shape in response to obstacles placed within the tunnel. The simulation will allow us to examine the behaviors of controllers in the future as they change shape (modes) in response to environmental conditions.

KIRKHOF CENTER GRR 037

**Quinpirole Mediates Aversive Effects of Methamphetamine via Dopamine D2 Receptors**
Presenter: Erin Reasoner
Mentor: Shkelzen Shabani, Biomedical Sciences

Innate avidity for methamphetamine (MA) use is influenced by sensitivity to its rewarding and aversive effects. MA induces these effects through release of the neurotransmitter dopamine, stimulating dopamine D2 receptors (D2R). The contribution of D2R to MA-induced motivational effects is poorly understood. In this study, we investigated motivational effects of D2R activation by using mice selectively bred for low MA drinking (MALDR) and high MA drinking (MAHDR). In a condition place preference (CPP) procedure, doses of 0.01, 0.1, and 0.5 mg/kg quinpirole, a D2R agonist, were paired with specific environmental cues; mice were later tested for cue preference. In both lines, quinpirole dose-dependently induced significant aversion and suppressed locomotor activity. MALDR mice alone showed enhanced locomotion in a drug-free CPP test. This study suggests that D2R plays a central role in the aversive effects of MA and is a potential therapeutic target for curbing MA intake.

KIRKHOF CENTER GRR 047

**VDECs of Cyclic Graphs**
Presenters: Michael Baas, Miah Masvero
Mentor: David Clark, Mathematics

A Vertex Distinguishing Edge Coloring (VDEC) of a graph is an edge coloring such that no two vertices have the same color set of edges incident to them. A strong coloring is a VDEC in which no adjacent edges share a color. We investigate the minimum number of colors necessary to generate a strong VDEC of a graph. Specifically, we explored this for the graph obtained by taking a cycle graph and adding a chord between two vertices separated by one vertex. We give exact values for the minimum number of colors necessary to assign a strong VDEC to this type of graph.

KIRKHOF CENTER GRR 060

**Evaluation of Organometallic Iron Complexes as Potential Flow Battery Electrolytes**
Participants attending 1:00 PM - 2:00 PM
Presenter: Logan Jurgens  
Mentor: Andrew Lantz, Chemistry

Over the years as interest in renewable energy has increased so has the need for more effective energy storage. One possible solution is redox flow batteries (RFBs), which utilize large reservoirs of liquid electrolytes which are pumped into a battery to store energy. Problems with currently used electrolytes, such as vanadium ions, are their cost, low abundance, and toxicity. Currently, aqueous organic molecules have been examined for use as potential alternative anode and cathode electrolytes. Here, we present the evaluation of a variety of organic iron ligands as possible electrolytes in redox flow batteries. Reduction potentials and redox kinetics for organometallic-iron complexes were measured via cyclic voltammetry. Initial flow battery charge/discharge testing with target electrolytes was also performed.

KIRKHOF CENTER GRR 064  
The L’dor V’dor History Project  
Presenter: Joel Hill  
Mentor: Marilyn Preston, Interdisciplinary Studies (IRIS)

The L’dor V’ Dor History Project involves the creation of a public exhibit documenting the history of Jews in Muskegon, Michigan through the members of Temple B’nai Israel. The purpose of this exhibit is to educate the community about Jewish history and life in West Michigan to spread awareness and understanding of diverse populations in an increasingly antisemitic society. This project involved collaboration between temple members, Museum staff, and GVSU faculty and students. Using interview data, as well as multiple dialogues and conversations with stakeholders, several themes were identified that will be used in the exhibit to meet the goals. These themes are Holidays, Ritual, Identity, Tradition, and Tikkun Olam (healing the world). The exhibit not only tells an intimate story of the congregation but is also appropriate for various learning levels, accessible, interactive, and immersive. The design will be implemented at The Lakeshore Museum of Muskegon in the fall of 2020.

KIRKHOF CENTER GRR 095  
Binding Morality Foundations, Moral Enhancement, and Religious Attributions Using a Bogus Feedback Paradigm  
Presenters: Lucretia Dunlap, Jayce Masters  
Mentor: Luke Galen, Psychology

The illusory belief that one is morally superior to others is widespread. There are individual differences in the need to see one’s self as moral. For example, religious individuals tend to self-enhance their perceived level of morality. In our study, participants completed measures of moral attitudes and behaviors and received either high or low (bogus) feedback on their moral performance. Those high in binding moral foundations (e.g., valuing obedience and group allegiance) who received high feedback were significantly more likely to attribute their motivation to religious sources. Binding moral foundations may be particularly linked to self-enhancement.
The Effect of Nocturnal Competitors on Common Marmoset Monkey (*Callithrix jacchus*) Feeding Behavior

Participants attending 1:00 PM - 2:00 PM  
Presenter: Lauren Gapp  
Mentor: Cynthia Thompson, Biomedical Sciences

Marmoset monkeys obtain food by gouging holes in trees to stimulate gum secretion. Although marmosets are among few mammalian species who consume gum, there is limited evidence that they may face competition from nocturnal foragers. We studied common marmoset monkeys (*Callithrix jacchus*) at Tapacurá Field Station in Brazil and monitored animal visits at feeding sites. We assessed revisitation rates and latency between feeding visits to identify if marmosets changed their feeding behavior in the presence of nocturnal foragers. Marmosets had higher revisitation rates for feeding sites that were shared with other species compared to sites that were not. Across all feeding sites, marmosets had significantly higher revisitation rates and smaller time spans between feeding visits after a nocturnal forager had visited. As such, the degree of competition marmosets face from nocturnal foragers may be sizeable enough to generate behavioral modifications.

Competitive Viability of Non-Virulent Salmonella Transformants with regards to a Wild-Type Salmonella

Participants attending 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM  
Presenters: Yazan Chabti, Michael Garnaat  
Mentor: Aaron Baxter, Biomedical Sciences

Salmonella is a leading cause of food borne illness. The pathogen invades epithelial cells in the small intestine via genes that encode for invasion, adherence, proliferation and survival. The goal of this research is to analyze a non-virulent Salmonella containing a fimbrial gene known to enhance biofilm formation and determine if it outcompetes wild type bacteria in vitro. Mutant strains were transformed with a plasmid containing RFP or GFP in order to separate them from wild type bacteria. Fluorescent microscopy confirms the transformants have similar morphologies and fluorescence. Growth curves show that all transformants grow about the same rate. Various methods including biofilm and invasion assays are required to confirm competitive viability and lack of virulence. If successful, introduction of the non-virulent strain into poultry will be done to analyze if the mutant strain can outcompete wild type Salmonella, thereby reducing the rate of salmonellosis in humans.
HENRY HALL ATRIUM 018

**Structural and Functional Characterization of New Clinically Relevant Enzymes Involved in Antibiotic Resistance**

Presenter: Micah Fernando  
Mentor: Bradley Wallar, Chemistry

Resistance to β-lactam drugs such as penicillins and cephalosporins has become a worldwide health problem. The World Health Organization has listed multi-drug resistant *Acinetobacter baumannii* as requiring “top priority for new antibiotic development.” Such antibiotic resistance derives primarily from β-lactamases, including *Acinetobacter*-derived cephalosporinase (ADC), which bind and destroy antibiotics. A recent study of clinical *A. baumannii* infections identified the most prevalent ADC β-lactamases conveying antibiotic resistance. This research study seeks to determine the structure and function of two clinical ADC variants: ADC-30 and ADC-162. Using X-ray crystallography and enzyme kinetics, we aim to relate the small changes in structure to their enhanced ability to turn over antibiotics. Characterizing the structure and function of clinical ADC variants will be critical to developing molecules that could inhibit ADCs, thereby restoring antibiotic effectiveness.

KIRKHOF CENTER GRR 018

**Testing the Ancestral Function of Divergent Candida albicans Virulence-associated Proteins via Expression in Saccharomyces cerevisiae Mutants**

Participants attending 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM  
Presenter: Curtis Mack  
Mentors: Ian Cleary, Derek Thomas, Biomedical Sciences

*Candida albicans* is an opportunistic fungal pathogen and a member of the normal human microbiota. It is closely related to the harmless fungus, *Saccharomyces cerevisiae*. Some genes associated with the virulent nature of *C. albicans* are similar to genes in *S. cerevisiae*. Three of these genes, PHO13, NRG1, and TUP1 are known to repress the change from yeast to filamentous growth in *C. albicans*, an important virulence trait. However, similar genes in *S. cerevisiae* are known to have functional differences. Our goal was to see if the ancestral function of these genes has drifted apart by examining the expression of *C. albicans* genes in *S. cerevisiae* mutants. This will lead us to know more about the regulatory mechanisms of *C. albicans*. We have successfully constructed *S. cerevisiae* strains expressing *C. albicans* genes and are now in the process of testing phenotypic differences.

KIRKHOF CENTER GRR 030

**Effects of Cannabidiol on the Caudate Putamen and Nucleus Accumbens of Mice**

Participants attending 2:00 PM - 3:00 PM, 4:00 PM - 5:00 PM  
Presenters: Alexander Perez, Alexander Ryan
Cannabidiol (CBD) is a “non-psychoactive” chemical found in cannabis that is thought to have treatment applicability for psychological disorders and physical illness. Reportings on the beneficial properties of CBD has led to an increased interest among the public. With this increasing interest in CBD have come many other claims on therapeutic effects that lack research support. Discrepancy in the effects of CBD, as well as escalating interest, demonstrate a need for substantial research on CBD.

The caudate putamen is a region of the brain that is associated with movement and learning. The nucleus accumbens is a component of the reward pathway of the brain, functioning in motivation. Dopamine release in both regions has been well-documented using Fast-Scan Cyclic Voltammetry (FSCV). FSCV is a technique allowing for accurate measurements of dopamine release as it occurs. This study investigates the effects of CBD on dopamine release in the caudate putamen and nucleus accumbens of mice.

**KIRKHOFF CENTER GRR 080**

**Quantifying Water Content in Olivine From North Carolina Dunites Using Fourier-Transform Infrared Spectroscopy**

Presenter: Thomas Byars  
Mentor: Ginny Peterson, Geology

The focus of this study is to quantify the water content in grains of the mineral olivine collected from the Buck Creek Ultramafic Suite—a fragment of ancient ocean crust emplaced into the Appalachian Mountains in North Carolina. Previous work on these samples includes Electron Back Scatter Diffraction (EBSD) analysis. EBSD data can constrain temperature and stress conditions of olivine deformation under different levels of hydration. The water in olivine was analyzed using a Fourier-Transform Infrared Spectroscopy (FTIR) at the North Carolina Museum of Natural Science. The olivine grains are doubly polished in preparation for FTIR analysis. The machine scans the grains with an infrared beam, collecting wavenumbers absorbed by the infrared beam. Amplitude peaks at specific wavenumbers are related to specific compounds, one of which is water. These analyses of water content will be used to inform and further constrain deformation conditions inferred from earlier work on these samples.

**KIRKHOFF CENTER GRR 116**

**The Organic Synthesis of Anthranilic Acid Derivatives as Potential Active Antibiotics**

Participants attending 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM  
Presenter: Paul Chappell  
Mentors: Rod Morgan, Laurie Witucki, Chemistry
The objective of this research project was to synthesize multiple derivatives of anthranilic acid. These derivatives will then be tested for antibiotic activity against Staphylococcus aureus and Escherichia coli (E. coli). As bacteria become more resistant to penicillin-based antibiotics, the exploration of anthranilic acid-based antibiotics could serve an important role for future medical use. This research project included data collection via $^1$H-NMR, $^{12}$C-NMR, TLC, MP, and IR to determine purity for biological testing.

BEGINNING AT 3:00 P.M.

HENRY HALL ATRIUM 001
Love it or List it: Enclosure Alterations Affect Behavior of Canada Lynx at John Ball Zoo
Presenters: Hailee Cederquist, Chelsea Clark
Mentor: Jodee Hunt, Biology

Environmental variables influence animal behavior, and routines of captive animals often alter when individuals are moved between zoos, their social group changed, or enclosure altered. In 2018, two Canada lynx were introduced to John Ball Zoo, then their exhibit subsequently modified in 2019. We used scan sampling with ZooMonitor to quantify behaviors and enclosure use of individuals every 30 sec in 30-minute bouts of sampling, comparing patterns in 2018 and 2019. Both cats used inconspicuous resting sites extensively, but the specific sites changed from 2018 to 2019. The male’s daily activities changed little, incorporating the same locomotion paths both years. The female was more active in 2019 than 2018, but sought resting sites above visitors both years. Overall, both cats sought sites hidden by vegetation in 2018, but adjusted to its removal in 2019.

HENRY HALL ATRIUM 062
Scoliosis and its Treatment in Adults
Presenter: Hilary Skalski
Mentors: Natalie Laudicina, Chris Reed, Dawn Richiert, Melissa Tallman, Biomedical Sciences

Scoliosis is a greater than ten-degree curve in the spine in the coronal plane. There are many types of scoliosis, with the most common being adolescent idiopathic. The most common type in adults is degenerative scoliosis, caused by the wear and tear of the spine. In adults, treatment options are selected based on symptoms caused by the curvature. Treatments include lifestyle changes, medications, physical therapy and surgery. Two common surgical treatments are a laminectomy for decompression or a spinal fusion. The dissection of a 92-year-old male cadaver revealed scoliosis of lumbar vertebrae one through five (L1-5). A post-mortem laminectomy then revealed that the spinous processes of L2 and L3 appear fused together. Additionally, a metal wire was wrapped around both sides of the fused spinous processes, with attachment points above L2 and below L3. This research project further investigated the possible reasons for the spinal abnormalities seen.

KIRKHOF CENTER GRR 014
The Role of ERK 1/2 Proteins in Diabetic Cardiomyopathy
Diabetes is characterized by inadequate utilization of glucose due to a lack of insulin. Cardiomyopathy is defined as chronic disease of the heart muscle. A correlation between diabetes and the onset of cardiomyopathy has been suggested though a complete understanding of this relationship remains to be determined. Induction of diabetes within mice via the injection of streptozotocin will allow for thorough investigation of this correlation. Enhancement of the proteins ERK 1/2, via the deletion of genes DUSP 6/8, has been shown to be a protective agent against various heart pathologies. By inducing diabetes within both wild type and DUSP 6/8 knockout mice it could be determined if these proteins are protective against the development of diabetic cardiomyopathy. The goal of this study is to further explore the correlation between diabetes and cardiomyopathy, as well as investigate protective effects ERK 1/2 proteins may have on the development of diabetic cardiomyopathy.

KIRKHOFF CENTER GRR 034
Evaluation of Testicular Morphology in Leptin-deficient Obese Mice with Reduced Fertility
Presenter: Kimberly Jason
Mentor: Chris Pearl, Biomedical Sciences

Mice lacking the leptin hormone (ob/ob) or leptin receptor (db/db), become obese and are reported to be subfertile and/or infertile. This study was designed to investigate testicular function in ob/ob and db/db mice. Daily sperm production was significantly reduced in the ob/ob mice while sperm production in db/db mice was similar to controls at 16 weeks of age. Seminiferous tubules appeared normal in the testis of all three genotypes, however, the percentage of tubules with open lumens was reduced in ob/ob and db/db mice at both 8 and 16 weeks. The height of the epithelium in ob/ob mice was higher than controls and db/db mice at both ages. The number of tubules with debris found in the lumen was greatest in ob/ob mice at both ages. Interestingly, fewer tubules contained cellular debris in older mice. Collectively these data suggest a disruption of seminiferous tubule function, specifically in ob/ob mice, that could explain the reduced sperm production and fertility in these animals.

KIRKHOFF CENTER GRR 059
Participants attending 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM
Presenters: Emily Dear, Emily Elliott, Emma Miller, Jeremy Wood
Mentor: Laura Stroik, Biomedical Sciences

Changes in the structure of ecological communities are often correlated with changes in the surrounding environment. The Bighorn Basin in Wyoming presents fossil evidence that depicts significant shifts in the community structure of North American mammalian species at the Paleocene-Eocene boundary. This diversity can be credited to marked temperature increases during
the Paleocene-Eocene Thermal Maximum. The association between temperature and dietary niche of omomyid euprimates, specifically the *Tetonius* lineage, was examined using reconstructed relief index, a dental topographic measure (N=20). A correlation analysis supported the hypothesis that abiotic changes in climate during the Paleocene-Eocene Thermal Maximum were linked to variation in omomyid dietary niches (P<0.05). These changes in *Tetonius* dietary niche are associated with anagenetic speciation in the lineage and may have been influenced by both shifts in climate and interactions with other members of the community.

**BEGINNING AT 4:00 P.M.**

HENRY HALL ATRIUM 091

**Laker Survival Guide**  
Presenter: Clara Bernal Ortiz  
Mentor: Matt Reid, Sociology

Grand Valley offers a plethora of resources for their students, but do students, particularly underrepresented students, know of or utilize these resources? After becoming a Peer Mentor for incoming freshman, I realized by my Junior year there was so much that GV offered but I did not utilize until years later. Therefore, I set out to create a “Laker Survival Guide” for my mentees and the larger GV community. My goal was to bring greater awareness to services and the guide is informed by a survey I gave to GV students, discussions with my mentees, and my experiences as a first-gen Latina student. This guide includes various academic support services, places to feel culturally accepted, and resources for non-traditional students. The guide also addresses the common dilemma where students feel overwhelmed by the amount of information given to them at orientation. Through presenting these resources in a simple, appealing manner, this book should expand student use of campus resources.

HENRY HALL ATRIUM 099

**Improving Annotation Recommendations in a Machine Learning Model**  
Presenter: Justin Kaukonen  
Mentor: Jared Moore, Computer and Information Systems

Honeybee colonies worldwide are under increasing threats from Colony Collapse Disorder (CCD) (vanEngelsdorp et al., 2010 Neumann and Carreck, 2009) and other environmental risks. Here at GVSU, we are developing a publicly available tool to identify potential problems by analyzing hive weight data with machine learning. Last year, we deployed the model publicly to the Bee Informed web portal. The model performs effectively but tends to over predict when events requiring beekeeper annotation are required. This year, we are working to improve the accuracy of our model by reflecting on current issues in the pipeline that can be improved. Specifically, we are focusing on
data normalization deemphasizing significant weight changes (harvests) in favor of more nuanced events. We then compare predictions from the new model to those of the previously deployed model in order to improve prediction accuracy.
Oral and/or Visual Presentation

BEGINNING AT 9:00 A.M.

KIRKHOFF CENTER 1104

Identifying Mnomen Habitat in the Muskegon River Watershed
Presenter: Robert Larson
Mentor: Griff Griffin, Biology

This study identifies the location of habitat of Wild Rice, culturally referred to by the indigenous people as Mnomen. The habitat being evaluated is within the Muskegon River watershed, located in western to central lower Michigan. The two species of Mnomen are *Zizania palustis* and *Zizania aquatica*. Both are native to the Great Lakes region.

Large amounts of habitat loss have caused Mnomen rice bed decline, which were abundant to the region pre-European settlements. Most of the large rice beds are now found in the northern Great Lakes region. This study looks at ideal habitat and location for restoration and reintroduction that are similar to the historical ranges of Mnomen in the Great Lakes region. This study uses GIS mapping to model historic and future ranges to show new restoration/reintroduction sites. Remote sensing is used to verify proper substrate, and current Mnomen beds established in the watershed.

KIRKHOFF CENTER 2263

Citizenship Through Conversion: Catholic Marriage in Senegal’s Communes, 1870-1897
Presenter: Julia Jesko
Mentor: David Eaton, History

Until recently, scholarly interest in African history concentrated on politics or economics, ignoring the lives of many ordinary Africans, especially women. Senegal, situated in West Africa, was no exception. However, the colonial archives in Dakar contain letters, court cases, and other materials that, if properly analyzed, reveal how ordinary people grappled with the new administrative landscape created by 19th century French colonialism. One well-documented colonial court case focuses on two Catholic African foreigners in the coastal city of Saint-Louis named Michel Moussa Sow and Marie Sagna. Their efforts to naturalize into a Commune city, a necessity before they could be legitimately married, offer valuable insights into the impact of the colonial state on everyday people in colonial Senegal.
BEGINNING AT 10:00 A.M.

KIRKHOF CENTER 1142
Old MacDawnald and Recreational Therapy
Presenter: Megan Harken
Mentor: Dawn De Vries, Recreation Therapy

The purpose of this research study is to discuss any evidence proving (or disproving) animal assisted interventions and their benefit in the recovery process of those who have experienced trauma. Animal-assisted interventions can include equine therapy, farm animal therapy, and/or pet therapy. Researchers aim to discover the effects of working with animals on coping mechanisms for individuals who have experienced trauma. In addition, the effectiveness of animal assisted interventions as a modality while in treatment for trauma will be determined.

KIRKHOF CENTER 2259
Un-Gerrymandering Michigan: A Hypothetical Look into Our Congressional Maps Following the 2020 Census and Redistricting
Presenter: Andrew Nurmi
Mentor: Whitt Kilburn, Political Science

“Gerrymandering” is the practice of drawing legislative maps of all levels (local, state, and federal) in a way that benefits the party in control of redistricting. Michigan’s maps have been gerrymandered for decades, but in November 2018, the voters of Michigan passed Proposal 18-2, which created a nonpartisan redistricting commission in the hopes of ending biased redistricting. In this project, I submit my own proposals for what various lines could be for our state’s congressional map in 2022, when these new districts will take effect. My project includes maps that are gerrymandered to benefit Democrats, to benefit Republicans, designed for competitiveness, and most importantly, what my subjective idea of a “fair” map could be. This is done using an online app called Dave’s Redistricting App, which allows users to create their own district lines of various legislative maps across the country.

KIRKHOF CENTER 2263
Living with Disabilities in Ireland vs. America
Presenter: Cecelia Findlay
Mentor: Susan Sunden, Recreation Therapy

This presentation is a look at the differences in respite care facilities in Ireland as compared to in the United States of America. The purpose of this project was to gain an understanding of key differences in the respite care options for individuals who have developmental disabilities in Ireland from America. The preliminary research completed served to gain an understanding of laws and societal norms in Ireland surrounding individuals who have disabilities. Then I spent four weeks (31 days) completing an International Studies Abroad service-learning program. The program consisted of completing 20-30 hours of volunteering with a local organization in Galway, Ireland that serves individuals with developmental disabilities and completing a variety of reflective assignments. This
Infectious wildlife diseases such as chronic wasting disease (CWD) can threaten populations of white-tailed deer. Understanding the rate of disease spread and the impact natural and artificial barriers have on the rate of spread is important for disease management. Using current location data for all confirmed CWD positive deer in Michigan, along with deer density estimates and potential movement barriers, a map was created using geographic information systems. Using Wisconsin as a comparable location with similar terrain and barriers, an estimated rate of spread of 1.13km/year is assumed for Michigan. Results indicate CWD will continue to spread at a relatively slow rate in Michigan and after 10 years, may be found in all townships surrounding the foci of confirmed cases if additional management practices are not introduced. Given the importance for CWD management, insights from this research may be valuable to management agencies in their efforts to slow the spread of this disease.

BEGINNING AT 10:30 A.M.

"What's Happening Brother": Detroit's Revolutionary Black Workers and the Vietnam War
Presenter: Nicholas Busby
Mentor: Louis Moore, History

The decade of the 1960s was pivotal in Detroit’s history. At a time when people struggled against imperialism and racism, Detroit’s Black community was especially cognizant of their role in this struggle. Based on extensive archival research findings, Detroit’s Black community intensely opposed racism and oppression, and Black auto workers were at the vanguard of this struggle within Detroit. These workers had strong reactions to the Vietnam War. The Inner-City Voice and the League of Revolutionary Black Workers were militant groups in Detroit’s Black community during the Vietnam War. The politics and ideals of these Black groups were aligned with the North Vietnamese, as both vehemently detested imperialism, capitalism, racism, and oppression. These organizations opposed America’s involvement in the war on numerous grounds, but most important was their affinity with the Vietnamese people based on ideals, economic philosophies, and a perceived common enemy: the American Government.

BEGINNING AT 11:00 A.M.
**Therapeutic Use of Play and Eating Disorders**  
**Presenters:** Amanda Corrin, Brooke Fox, Emma Paden, Rachel Rusceak, Shelby Szudera Wienand  
**Mentor:** Dawn De Vries, Recreation Therapy

Play is needed by every individual as a means of developing healthy communication, interpersonal skills, and creative thinking. The therapeutic use of play when used in the context of Recreational Therapy, will help individuals holistically with individualized interventions. Certified Therapeutic Recreation Specialists can facilitate the therapeutic use of play through the development of specific goals for treatment outcomes. Through this systematic review of the literature available, data on specific interventions and beneficial outcomes related to treating eating disorders will support the therapeutic use of play as an effective intervention in Recreational Therapy.

**Ecuador is Black: Afro-Ecuadorian Literary Resistance in Drums Under My Skin**  
**Presenter:** Gabriella Davis  
**Mentor:** Regis Fox, English

The transcendence of Black Ecuadorian literature has the power to rewrite narratives that have constructed them as hypersexual or invisible. By telling their own stories, Black Ecuadorian writers not only place Blackness into the Ecuadorian national narrative. They make their existence the center of everything. In *Drums Under My Skin*, Luz Argentina Chiriboga writes of Rebeca, a *mulata* teenager struggling to accept her Blackness while spilt between the ideological spaces of Quito and Esmeraldas. Chiriboga confronts racism in Ecuador based around *mestizaje* by making Blackness the sole narrative voice and rejects ideas that Blackness doesn’t belong in Ecuador. Concurrently, she allows for Rebeca’s sexual exploration despite the Ecuadorian narrative of the hypersexual Black woman. I contend that although Rebeca suffers sexual and racial abuse from white Ecuadorian people, she ultimately rejects Ecuadorian racist sexism by accepting her body as a historical memory of Black resistance.

**Examining the Effect of a Hypothetical Safe Injection Facility on HIV and HCV Transmission Rates in Kent County, Michigan**  
**Presenter:** Trevor Ditmar  
**Mentors:** Babasola Fateye, Adedipupo King, Biomedical Sciences

Previous literature has established that increases in prescription opioid misuse has resulted in similar increases in injection drug use (IDU), collectively referred to as the “opioid epidemic” in the US. Due to this surge in IDU, incidence of Hepatitis C (HCV) and Human Immunodeficiency Virus (HIV) are on the rise in many regions. Research conducted in Canada and elsewhere has supported the use of Safe Injection Facilities (SIFs) and Needle Syringe Programs (NSPs) to mollify disease incidence, but only NSPs are operating in the US despite SIFs having been in use in Canada for several decades. As
little research has been conducted in the US about where SIFs could be of benefit, we employ an analytical model to estimate the value of a hypothetical SIF in Kent County, Michigan (MI) using local surveillance data. Addition of such a facility was found to reduce HCV incidence by 7 cases / year, in addition to decreasing HIV incidence by 5%.

KIRKHOF CENTER 2263

**Searching Games: A Bound for the Responder**
Presenter: Jose Garcia
Mentor: David Clark, Mathematics

A searching game with two unknowns and a lie involves two players, the *responder* and the *questioner*. Before the start of the game, the two parties predetermine an amount of numbers \( n \) to consider, and how many questions \( k \) the questioner can ask before the game ends with a victory (or loss) for the responder. The responder thinks of two secret numbers. The questioner asks questions of the form “How many of your two numbers are in the subset \( Q \) of the set \( \{0, ..., n-1\} \)?”, in an attempt to search and find what the two secret numbers are. If the questioner identifies the two secret numbers within the agreed upon number of questions \( k \), the questioner wins. The responder is allowed to lie in the game at most one time. We identify a bound on \( n \) and \( k \) for which the responder is guaranteed to win. This research was completed as part of an Alayont Fellowship in the Fall of 2019.

KIRKHOF CENTER 2270

**The Hidden Cost of Gaycations: An Interdisciplinary Investigation of Queer Cross-Class Contact in Rural Resort Towns**
Presenter: Brynn Wilfong
Mentor: Jae Basiliere, Women, Gender, and Sexuality Studies

This research project explores the cultural collisions that occur between local queer residents of rural gay resort towns and wealthy urban visitors. These towns, which rely on the economic support provided by an annual influx of urban tourists, experience a yearly metronormative colonization of space, the effects of which fail to prioritize the needs of year-round queer residents, thereby alienating them. I will trace the origins and consequences of these class-based ruptures by sharing narratives that illuminate local residents’ experiences of place, queer identity and power dynamics within these spaces, as well as tourists’ motivations for visiting gay resort towns.

BEGINNING AT 12:00 P.M.

KIRKHOF CENTER 2266

**Polycube and Polyomino Primality**
Presenters: Mirza Komic, Nicholas Layman, Cian-Kyler Young
Mentor: David Clark, Mathematics
Abstract: A polyomino is defined as a connected plane figure formed by joining unit squares edge to edge. A polycube is the three-dimensional version of a polyomino. We examine various number theoretic aspects of polyominoes and polycubes, including primality and divisibility. We say that shape A divides shape B if you can build B utilizing copies of A. We prove when T-shaped polyominoes are divisible by a domino, as well as when they are prime. We also prove divisibility theorems for polycubes.

BEGINNING AT 12:30 P.M.

KIRKHOF CENTER 2259
**SARS-CoV2: Impacts and Implications**
Presenter: Gage Paul
Mentor: Doug Graham, Biomedical Sciences

SARS-CoV2, the virus at the heart of the current global pandemic, belongs to a lineage with a history of causing acute respiratory and intestinal infections in both animals and humans. Members of this family, referred to as coronavirus, caused two earlier outbreaks, Severe Acute Respiratory Syndrome (SARS) in 2003 and Middle East Respiratory Syndrome in 2012, resulting in significant morbidity and mortality. To date, COVID-19, the disease caused by SARS-CoV2, has stricken more than 71,000 persons worldwide and claimed more than 1,800 lives. Cases of COVID-19 were first reported in China in late 2019 and have now been documented in 28 countries including the U.S. Highly infectious and lethal, COVID-19 is not only a public health emergency but has the potential to seriously impact the global economy. This presentation covers general scientific and medical concepts related to COVID-19 and explores how it is impacting the broader arc of human affairs, including student life at GVSU.

BEGINNING AT 1:00 P.M.

KIRKHOF CENTER 1142
**Peoples' Perceptions of Dogs with Disabilities as Therapy Animals**
Presenters: Ellen Pelletier, Brooke Smith
Mentor: Dawn De Vries, Recreational Therapy

This presentation will examine results from a survey administered to people at Grand Valley State University on their perception of dogs with mobility impairments as therapy animals. This research study evaluates the rationale for dogs with mobility impairments as therapy animals in the context of self-efficacy theory.

KIRKHOF CENTER 2201
**Exploring an Alternative Role for the COP9 Signalosome in the Ethylene Response Pathway**
Presenter: Austin VanDenTop
Mentor: Matthew Christians, Cell and Molecular Biology
The gaseous hormone ethylene regulates various responses in almost all developmental stages of all plant species. A key protein in the pathway for sensing ethylene is the ER membrane protein Ethylene Insensitive 2 (EIN2), which is cleaved via an unknown interaction and travels to the nucleus. The protein responsible for this cleavage is unknown, however EIN2 has been shown to co-purify with a subunit of the COP9 Signalosome (CSN), a well characterized protease complex. In this project, we investigated CSN involvement in the cleavage of EIN2 using genetic knockouts of CSN subunits and Western blots of EIN2 mutants. We have found that the mutant csn5a-1 has a significant shortened hypocotyl, and an abnormal phenotype. Through trials of protein extraction and Western blots, we have shown EIN2 C-terminus, which can be used to quantify EIN2 cleavage. Through characterization of this interaction, we can gain information on critical regulation pathways that are present in all plant species.

BEGINNING AT 1:30 P.M.

KIRKHOFF CENTER 2201
A Biopsychosocial Interpretation of the Function of Religion Evolutionary Perspectives, Jamesian Principles, and Consequential Effects
Presenter: Austin Avison
Mentors: Azfar Hussain, Sarah King, Integrative, Religious, and Intercultural Studies

This article seeks to assess the psychological role in which religion plays within human emotion, behavior, and mental processes. The aims of this research are to provide a psychological oriented basis for interpreting the function of religion within human operation and interaction. First, by incorporating contributions that have been made within the subfield of evolutionary psychology in assessing the evolutionary and adaptive basis in which religious cognition and experience emerged. Further, by addressing the theoretical contributions made within Terror Management Theory in accounting for a psychological function that religion serves. Third, by incorporating the ideas of William James in providing a means of interpreting the experience of individuals. Finally, an assessment is provided of the psychological outcomes that are found to be associated with religion. While interpreting the effects that religion and spirituality have in terms of its consequential functional outcomes.

KIRKHOFF CENTER 2266
The Monomyth Strikes Back
Presenter: Kristie DeVlieger
Mentors: Maya Hobscheid, Hazel McClure, University Libraries
The Monomyth, commonly referred to as The Hero’s Journey, examines the stages of the hero who goes on an adventure, faces a crisis, and returns victorious. This narrative framework has relevance in a variety of fields, including marketing, narrative creation, classroom instruction, and literature analysis. As a WRT (Writing) major, I encountered many stories that would have benefited from the monomyth and sought a way to provide a tool to fill this need for student writers. My research involved reading related texts and creating a survey to evaluate current student knowledge. I learned several of the invisible research components, user accessibility training, and two software systems. I was able to create a Subject Guide on the Monomyth for the Library Website, that provides a comprehensive introduction to the topic and provides further resources. The Monomyth has continued importance as new applications of the framework develop, something I have been experimenting with since.

KIRKHOF CENTER 2270

**Non-attacking Queen and Rook Placements**
Presenter: Nicholas Layman
Mentor: Feryal Alayont, Mathematics

In 1848, Max Bezel introduced the problem of placing 8 queens on an 8 × 8 chess board so that none of the queens could attack each other. One generalization of this — the placement of $n$ non-attacking queens on an $n \times n$ chess board — is the famous $n$-queens problem. A different but similar problem is that of placing non-attacking rooks on a generalized chess board which has connections to restricted permutations and has more general solutions known as compared to its queen counterpart. In this presentation, we investigate the intersection of these two problems — placing $n$ pieces (either queens or rooks) on an $n \times n$ board.

BEGINNING AT 2:30 P.M.

KIRKHOF CENTER 2201

**Microbial Experience Influences Tumor-infiltrating CD8+ T Cells**
Presenter: Hanna Groeber
Mentor: Kristin Renkema, Biomedical Sciences

Immune cells have been harnessed for anti-cancer therapy with varying degrees of success. One reason for immunotherapy failures in clinical trials may be that typical specific pathogen free (SPF) mice do not model human microbial experience. We have adopted a model of microbial experience by co-housing SPF mice with pet store mice, therefore exposing the SPF mice to various pathogens. Our cohoused (CoH) mice are exposed to pathogens, while SPF controls remain pathogen-free; CoH mice also gain CD44hiKLRG1hi CD8+ T cells in the blood and spleen. We injected B16 melanoma cells into SPF and CoH mice and monitored tumor development and T cell activation ex vivo and in vitro. CoH tumors had increased frequencies of CD44hiKLRG1hi CD8+ T cells compared to SPF tumors, and CoH tumor-infiltrating CD8+ T cells exhibited increased activation. Ultimately these findings will contribute to our understanding of how microbial experiences shape anti-tumor immunity for future immunotherapy research.
In 1963, Corradi and Hajnal proved that for any positive integer $k$ if a graph contains at least $3k$ vertices and has minimum degree at least $2k$, then it contains $k$ disjoint cycles. This result is sharp, meaning there are graphs on at least $3k$ vertices with a minimum degree of $2k-1$ that do not contain $k$ disjoint cycles. Their work is the motivation behind finding sharp conditions that guarantee the existence of specific structures, e.g. cycles, chorded cycles, theta graphs, etc. In this talk, we will explore minimum degree conditions which guarantee a specific number of doubly chorded cycles, graphs that contain a spanning cycle and at least two additional edges, called chords. In particular, we will discuss our findings on these conditions and how it fits in with previous results in this area.

BEGINNING AT 4:30 P.M.

Almost 2,500 years ago, Aristophanes wrote a scathing critique of Greek democracy and today it has the power to illuminate the failings of America’s current political state. Through the comedy of absurd power, the parallels between Pisthetaerus and Donald Trump disturb. This presentation will investigate the statements Aristophanes made against the Ancient Greeks and extend them to the executive branch of America’s government.

Sessions

BEGINNING AT 1:00 P.M.

KIRKHOF CENTER 2263
Conversations on Representation of Marginalized Communities
Presenters: Gabrielle Angel, Ysabela Golden, Keenan Kangas, Rachael McCollum
Mentor: Leifa Mayers, Women, Gender, and Sexuality Studies
Gabrielle Angel
Social media is used by many queer individuals to engage with content and cultural texts in an interactive way. This interaction provides an opportunity to give new meaning to these texts through a process of cultural recoding, or the creation of a new meaning for an object. My project uses critical discourse and visual analyses to understand how queer individuals have used cultural recoding to prescribe queerness to cryptids, or hidden animals like Big Foot. I seek to understand the ways in which these cryptids, whose existence is unconfirmed but plausible, have been recoded by queer individuals as both a form of representation and a way to subvert ideas of queer monstrosity. This recoding occurs in a world that is not built to support queer identities. Cultural recoding of objects like the cryptid can operate as a queer survival strategy as people navigate a world that systematically minimizes their existence.

Ysabela Golden
Market research indicates that nearly half of *Magic: The Gathering* players are women, but in-person competitive events are almost exclusively attended by men. Why do the women who make up 38% of the player base seem to only play casually, while men attend prereleases and Grand Prix events? This demographic disparity reflects broader findings on women’s relationship with competition from decades of research in sociology and gender studies. This project uses a survey to ask players — both men and women — why they do or don’t attend in-person competitive events, with the intent of clarifying the origins of this gender gap. Anticipated findings are that women will report more discomfort than men in competitive in-person settings. Understanding why women may feel excluded from competition in this community can have important implications for addressing women’s underrepresentation in a variety of competitive fields.

Keenan Kangas
For hundreds of years, ballet has upheld a gendered binary of dancer archetypes. As a result of this binary, men are forced to assimilate into an ideal mold of masculinity if they wish to be successful in their career. While there is a general consensus on this topic in the literature, widely accessible videos of dance performance have not been analyzed. In my research project, I am applying visual analysis to a variety of ballet YouTube videos. I will code for the ways in which the performances contribute to or resist the expected ideals of masculinity in dance. I anticipate finding specific commonalities and trends among these videos in the stories they tell about masculinity. This study is significant for understanding the gender representations in dance that are widely accessible online.

Rachael McCollum
The title of this report is “Analyzing the Effect of Cure Rhetoric in Science Fiction.” Drawing from research in disability media studies, I analyze episodes and story arcs of popular science fiction television shows to study how they utilize the story element of curing disability. I use narrative analysis and visual analysis to understand media representations of disability in science fiction serials including Doctor Who and Star Trek. I seek to understand how these portrayals reflect the societal stereotypes about the quality of life of disabled people. I anticipate that these findings will indicate the usage of disabled bodies and concepts of cure as a way of indicating the quality of the portrayed future. The implications of this are that they may dismiss the lived experiences of disabled people in order to make a sweeping statement about medical advancements, in a way that goes against the stated desires of disabled people.
BEGINNING AT 3:00 P.M.

KIRKHOF CENTER 2215/2216

Psychology Department Oral Session I

Presenters: Madeliene Albrecht, Austin Bastien, Lola Erfourth, Tylor Kistler, Caryne Sterling, Monica Van Til

Mentors: Tara Cornelius, Mario Fific, Leon Lou, Todd Williams, Psychology

Madeliene Albrecht

The Effect of Drawing Order on Proportion Accuracy in Observational Drawing

In a human figure drawing, the head is typically drawn earlier than other body parts and tends to be disproportionately larger (Thomas & Tsalimi, 1988). An experiment tested whether this proportion error has to do with 1) the tendency to perceptually inflate an attended part, and 2) ascribing more significance to the head than the rest of the body. We ask subjects to draw an object with a top-to-bottom segmentation: a wooden human doll or a vase in the center and another object (mug) in the periphery of the scene. Subjects are asked to draw the center object from the top down or from the bottom up, and to draw the center object or the periphery object first. We expect the center object to be drawn bigger than the peripheral object due to the focused attention on the center. We also predict a bigger head-to-trunk ratio when the head is drawn first, but an absence of a similar bias in drawing the vase.

Austin Bastien

See first author (Albrecht) for abstract.

Lola Erfourth

See first author (Van Til) for abstract.

Tylor Kistler

Barriers to Bystander Interventions for Sexual Assault

Bystander intervention programs have consistently demonstrated beneficial effects on community norms and intervention behaviors (Kettrey, Marx, & TannerSmith, 2019). However, much of the research fails to measure opportunities to intervene relative to actual behaviors (McMahon et al., 2015), and how these behaviors relate to a personal history of sexual victimization (Woods et al., 2016). This study aimed to examine the relationship between a bystander’s victimization history, perceived barriers, and bystander intervention. Data from undergraduate students (N = 583; 79.7% female; MAge=18.92) suggested that those with such a history perceive themselves as less able to identify risky situations, but are actually more likely to notice such situations and less likely to intervene. Therefore, it may be necessary to target perceived barriers as well as the disparity between observations and interventions in risky situations.

Caryne Sterling

See first author (Albrecht) for abstract.

Monica Van Til
Diagnosing Short-Term Memory Scanning Using Systems Factorial Technology: A Conceptual Replication

Townsend and Fific (2004) published an influential short-term memory (STM) study in which they observed individual differences in serial and parallel STM scanning. The authors employed systems factorial technology—a novel methodology that provides strong diagnostic tests of cognitive structuring—and presented a new method of manipulating probe-to-memory item processing speed for memory loads (N=2). Three variables were manipulated in this experiment: number of processing elements (N=2), phonemic dissimilarity of a target to the particular memorized item (high, low), and duration between the memorized set and a target (short, long). In the original study, 10 subjects each participated in 20 sessions. The present study serves as a conceptual replication in which two-hundred subjects each participated in 1 session and a novel memory load condition was included. Results contributed converging evidence in testing serial/parallel processing in short-term memory scanning.

KIRKHOF CENTER 2263

Health through a WGS Lens

Presenters: Ariana Christian, Jennifer Gole, Samantha Gregoire, Shia'Ann Lee
Mentor: Leifa Mayers, Women, Gender, and Sexuality Studies

Ariana Christian,

Of the 23.1% of female undergraduate college students that experience sexual violence, only 1 out of every six women will get help for the effects of the violence. This project examines the language that is used in offering help to survivors of sexual violence on the Western Michigan University, Central Michigan University, and Grand Valley State University campuses. Discourse analysis is used to code the websites’ language for assumptions about gender, class, and economic status. This research has implications for the accessibility of supportive services for the victim-survivors of sexual assault.

Jennifer Gole

In 2017 the global market for menstrual products was valued at 31.23 billion dollars. Much of the world's population menstruates, and advertising plays an important role in shaping how global audiences perceive menstruation. In this project, I examine Kotex advertisements in the magazine Good Housekeeping from the initial marketing of menstrual products in the 1920s to the late 1990s. I apply feminist discourse analysis and visual analysis to advertisements obtained through ProQuest’s Women’s Magazine Archive, coding for shifts and consistencies present in Kotex’s messaging over the decades. Preliminary findings suggest that early advertisements work to establish Kotex products as a necessary addition to women’s menstrual experiences, and advertisements across all decades convey implicit messages of shame and concealment. Examination of a prominent brand’s messaging across decades offers important insight into how those who menstruate, and society at large perceive menstruation.

Samantha Gregoire

A death of a mother during pregnancy, childbirth, or postpartum is one of the greatest tragedies that can occur within a family, with wide-ranging consequences for the child, their family, and the larger society. The maternal mortality rate in the United States has been steadily increasing since the early
1990’s and has now skyrocketed past the global rate of 10.3 deaths per 100,000 births to 28.3 deaths. This research project analyzes the text of bills and debates in the United States Congress from the early 1990s to the present on the subject of maternal mortality and how the legislation and conversation around the subject has changed over time as the statistic has risen. An intersectional approach is applied as the texts are analyzed to understand the congressional construction of the typical 'mother' of maternal death and their attempts to relieve this public health failure.

Shia’Ann Lee

In the United States, people of color are at greater risk of mental illness due to the constant emotional and physical labor of dealing with racism and other intersecting systems of oppression. Coupled with stigmas of mental health in Black communities, and violence against Black men, this has impacted black men's mental health. Black men in the United States have some of the lowest life expectancy rates and quality of life levels compared to every other racial and ethnic demographic. This research uses an intersectional approach to analyze tweets published on a Black men’s mental health twitter page to see how Black men are conceptualizing their own mental health issues in today's political climate. Preliminary findings suggest that Black men are making connections between racism, white privilege in politics, and mental health issues. While the discussion of Black men's mental health is ongoing, it is important to hear their experiences in their own words.

BEGINNING AT 4:00 P.M.

KIRKHOF CENTER 2215/2216
Psychology Department Oral Session II
Presenters: Dominic Bonanni, Molly Dayton, Lucretia Dunlap, Hanali Gilbert, Jayce Masters, Kegan Olsen, Ethan Reischling, Elise Richards, Joshua Thompson
Mentors: Luke Galen, Todd Williams, Michael Wolfe, Psychology

Dominic Bonanni

See Kegan Olsen, "Does Misinformation..." first author, for abstract
Molly Dayton

See Kegan Olsen, "Does Misinformation..." first author, for abstract
Lucretia Dunlap

Binding Morality Foundations, Moral Enhancement, and Religious Attributions Using a Bogus Feedback Paradigm
Lucretia Dunlap, Jayce Masters & Luke Galen
The illusory belief that one is morally superior to others is widespread. There are individual differences in the need to see oneself as moral. For example, religious individuals tend to self-enhance their perceived level of morality. In our study, participants completed measures of moral attitudes and behaviors and received either high or low (bogus) feedback on their moral performance. Those high in binding moral foundations (e.g., valuing obedience and group allegiance) who received high feedback were significantly more likely to attribute their motivation to religious sources. Binding moral foundations may be particularly linked to self-enhancement.

Hanali Gilbert

See Elise Richards, "Machiavellianism" first author, for abstract

Jayce Masters

See Lucretia Dunlap, "Binding Morality" first author, for abstract

Kegan Olsen

Does Misinformation about Past Beliefs Influence Current Beliefs?
Kegan Olsen, Michael Wolfe, Molly Dayton, Dominic Bonanni & Todd Williams
When belief change occurs, people tend to mis-remember their initial beliefs. Specifically, past beliefs are recalled as closer to their current beliefs than they really are. This implies that current beliefs are salient at the time of recollection, which influences the recollection process. Alternately, it is also possible that current beliefs are themselves influenced by information that is salient at the time they are stated. In this experiment, subjects read a text that was consistent or inconsistent with their previously stated beliefs on gun control. Next, subjects reviewed their previously stated beliefs, where the gun control belief they verified was either accurate, or opposite to what they had reported and then reported their current beliefs. Results may show that misinformation about past beliefs can influence current beliefs.

Ethan Reischling

See Joshua Thompson, "The Under-representation of Women" first author, for abstract

Elise Richards

Machiavellianism Predicts Careless Responding if Incentive is Present
Elise Richards, Hanali Gilbert, Alex Denison, Michael Wolfe & Todd Williams
Using the Two-Dimensional Machiavellianism Scale (TDMS; Monaghan, Bizumic, Williams & Selbom, 2019), we assessed whether Machiavellianism was related to careless responding. The participants were introductory psychology students who had completed the TDMS and the mini-IPIP personality inventory (Donnellan, Oswald, Baird & Lucas, 2006) during a pre-screening session earlier in the semester. The study had participants complete a basic arithmetic task, followed by the mini-IPIP. Participants were instructed to complete the mini-IPIP as quickly as possible, but without sacrificing response accuracy. Results show that when quick responding was incentivized higher levels of Machiavellianism predicted increased levels of careless responding. Careless responding did not vary by Machiavellianism when incentive was not present.
Joshua Thompson

The Under-representation of Women in Magic the Gathering
Joshua Thompson & Ethan Reischling

Magic the Gathering (hereafter MTG) is a trading card game that has more than 20 million active players. MTG is played both recreationally and competitively, and some players compete for substantial prizes at professional events. Although women comprise roughly 38% of all players, they comprise only 1-5% of professionals. We are conducting an online survey of MTG players to explore why women are underrepresented among professionals. Previous studies suggest that women may be underrepresented because, compared to men, they are less competitive, practice and play less, practice differently, receive less social support, or face discrimination. We will present our results and discuss their potential implications for understanding women’s underrepresentation in other achievement areas.
3-D Exhibition of Art

BEGINNING AT 9:00 A.M.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 12
Pushing Boundaries: Experimental Expressions
Presenters: Abigail Emens, Olivia Kelly, Sydney Kruise, Jillian Neumann, Kimberley Quinn, Meghan Reiman, Jacob Westbrook, Zoe Zaroff
Mentor: Victoria Veenstra, Video and Media Arts

Part One - Natural

As a collective, we aim to explore the interplay between nature and humanity through experimental photographic mediums both 2D and 3d. We hope to convey eight different interconnected perspectives on this concept. To achieve this, we incorporate photographic mediums involving elements from the natural world such as the obvious, plants, butterflies, and spider webs, to the more abstract existence of humans. We were once heavily connected with nature, relying on it to sustain life. While nature continues to be essential to human survival, we have become disconnected.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 13
Pushing Boundaries: Experimental Expressions
Presenters: Abigail Emens, Olivia Kelly, Sydney Kruise, Jillian Neumann, Kimberley Quinn, Meghan Reiman, Jacob Westbrook, Zoe Zaroff
Mentor: Victoria Veenstra, Video and Media Arts

Part Two - Unnatural

As a continuation of part one, we attempt to accentuate the growing disconnect from nature. In their obsession for perfection, humans have sought to replicate everything natural in a flawless and everlasting way. Not only have we produced fake plants and artificial flavoring, but we have also started manipulating ourselves to form a distorted version of the original. To show this, we are combining human elements with our synthetic products and framing our work in a way that you can clearly see the distortion. Nature is essential to human survival, yet we continue to become unnatural. Survival is not guaranteed.