

14TH ANNUAL
**EDGEWOOD
ENGAGED
2018**
INQUIRY RESEARCH
CREATIVITY

April 25-27, 2018

Featuring Keynote Speaker
Catherine Kautsky



EDGEWOOD COLLEGE

Keynote Lecture/Recital:

Thursday, April 26, 6:15 PM, Anderson Auditorium

“Debussy and His Friends: An Evening of French Music, Poetry, Art, and Politics.”

WELCOME TO EDGEWOOD ENGAGED 2018: INTERSECTIONS

The Edgewood College Monroe Street campus will bustle with scholarly activity beginning Wednesday, April 25, 2018, as Edgewood Engaged celebrates its 14th year.

Following is the complete program of activities, receptions, events, poster presentations, and oral presentations that are offered as part of this celebration. I encourage the Edgewood community and our community guests to attend the variety of sessions offered by our engaged learners.

While student research has been a long-standing feature of the Edgewood College experience for students and faculty, illuminating the significance of inquiry and creative activity is an integral part of a liberal arts education in the Dominican tradition. The pages of this program signify the vitality and distinctiveness of student research on our campus – in addition to the effort required to bring an event of this scope and magnitude to fruition.

Our keynote speaker this year is Dr. Catherine Kautsky, chair of keyboard at Lawrence University. *The New York Times* lauded her as “a pianist who can play Mozart and Schubert as though their sentiments and habits of speech coincided exactly with hers...” She has performed in major halls in New York, Chicago, St. Louis, Washington, Boston, and others and she appears frequently on public radio. Her book, *Debussy's Paris: Piano Portraits of the Belle Epoque*, was published in 2017 by Rowan and Littlefield.

I'd like to extend sincere appreciation to the students, faculty and staff who contribute to the culture of scholarship at Edgewood, and to those who serve to organize and realize Edgewood Engaged. I look forward to seeing the ways in which this event, and the work leading up to it, enriches our campus each year.

Yours in Leadership,



Dean A. Pribbenow, PhD
Vice President for Academic Affairs

TABLE OF CONTENTS

WEDNESDAY, APRIL 25, 2018	4
Investigations in Nursing.....	4
Investigations in Gender Studies.....	6
Investigations in Technology and Business.....	7
Investigations in Gender, Race, and Class in French Cinema.....	8
Investigations in Social Psychology.....	8
Investigations in Learning, Beliefs and Action for the Common Good.....	10
Investigations in Health Care Ethics.....	10
Investigations in Art.....	11
Honors Reception.....	12
THURSDAY, APRIL 26, 2018	13
Investigations in Dramaturgy.....	13
Investigations in Digital Romanticism.....	13
Poster Session.....	13
Celebration Reception.....	18
Keynote Lecture/Recital.....	18
FRIDAY, APRIL 27, 2018	19
Investigations in Biology.....	19
Investigations in Music.....	20
Investigations in Dismantling Racism.....	21
Investigations in Social Justice.....	23
Investigations in Communications.....	23
CONCURRENT FINE ARTS EVENTS	24
SATURDAY, APRIL 28, 2018	25
Investigations in Biology.....	25

INVESTIGATIONS IN NURSING

8:00 AM - 11:00 AM, THE NONA MCGREAL ROOM

Best Practices for Prevention of Ventilator Associated Pneumonia in Acute Care Settings

Taylor Halvorson, Brittany Hudziak, Matthew Schaaf, Jenna Caffrey

Mentor: Tracy Towne

The focus of this review is the prevention of ventilator associated pneumonia in the acute care setting. The approach used for this review will be vigorous data analysis by numerous scholarly resources. This integrative review will present the best practices to reduce the incidence of ventilator associated pneumonia in the acute care setting and discuss how they can be implemented by nurses to benefit patient outcomes. The implementation of the prevention practices discussed in the review will not only reduce the risk of VAP, but will also reduce the length of hospital and ICU stay for patients, decrease mortality rate for patients and reduce the cost of hospital stay for both patients and hospitals. The results of this study if implemented could make a huge difference in the lives of between 250,000 and 300,000 patients a year, in the United States alone, that acquire Ventilator-associated pneumonia (Koenig & Truwit, 2006).

From a Nursing Perspective: Reducing Risks of Operating on the Incorrect Patient in an Ambulatory Setting

Kayla Harrison, Savanna Hussey, Anna Toppel, Kaitlyn Vieth

Mentor: Ernise Williams

Surgical errors occur frequently, and they can lead to poor prognosis of patients. Many times, these surgical errors can be prevented easily; however, they are still occurring in today's world of modern medicine. We will examine if there are nursing interventions that could reduce these errors. As future nurses, it is important to identify possible errors and advocate for the patient, especially in the operating room, to ensure they do not occur. It will be beneficial to understand why procedures and policies are in place to educate the patient on why certain steps are taken prior to, during, and after surgery.

Prevention of Catheter Associated Urinary Tract Infections in the Acute Care Setting

Hailey Buteyn, Alyssa Dale, Hannah O'Dea, Nicole Wacek

Mentor: Tracy Towne

The prevalence of catheter associated urinary tract infections (CAUTI) is one of the highest of all healthcare-associated infections. In addition, nurses are often the initiator and primary care providers of placement and management of catheters in acute care settings. Finding the best nursing methods and practice to prevent CAUTI in acute care settings is the main focus of this integrative review. Throughout the research process, the best methods of prevention include technique, hygiene and daily cares, and reduction of unnecessary catheterization. We collected this information from multiple evidence-based research articles regarding prevention of CAUTI. In conclusion, we have found that it is critical for nurses to examine their urinary catheter insertion policies and practices to decrease the incidence of CAUTIs. It is important that every hospital establishes specific guidelines that determines whether a patient qualifies to have a catheter or not. If a patient does not fit into these guidelines, then alternatives to catheters should be used. If a patient needs a catheter, effective hand-hygiene and aseptic techniques must be used.

Nurses Coping with Verbal Violence in the Healthcare Setting

Christine Quall, Rachel Schieldt, Kenzie Gorman, Kayla Nytes

Mentor: Ernise Williams

Verbal violence is a concern for nurses around the world, affecting not only the nurse, but also their patients. Nurses are at the most risk for violence in the healthcare profession, especially females. Some nurses describe their beliefs that pleasant patients balance out the violent ones, but not all nurses have the ability to cope with verbal violence in that way. The nurses without effective coping mechanisms may experience increased stress and anxiety, absenteeism, substance abuse, or quit their jobs. The purpose of this integrative review is to help answer the question, "How do nurses cope when they experience patient verbal violence in the healthcare setting?" Finding from our integrative review of the literature completed using the Cumulative Index for Nursing and Allied Health Literature (CINAHL) database and searching for peer-reviewed, full text articles published in the last five years will be presented.

Best Practices for Fall Prevention in Older Adults in the Acute Care Settings

Patty Giles, Kelsey Jenny, Lacy Kranenbuhl, Colleen Rakowski

Mentor: Tracy Towne

Every year, thousands of patients fall in the hospital setting and result in increased costs, longer stays, decreased independence, and further decline in health. Every member of the interdisciplinary team plays an integral role in the prevention of falls in hospitalized geriatric patients, specifically nurses. The purpose of this integrative review is to focus on the best practices for fall prevention in older adults in the acute care setting. A literature review was conducted to identify and critique the research detailing the best evidence-based guidelines for fall prevention in older hospitalized patients. This integrative review will present the best practices for fall prevention for hospitalized elderly patients and how nurses can implement these practices to improve patient outcomes.

Chronic Illnesses in the Elderly Population and Rates of Hospital Readmission

Kylie Kubly, Cassandra Hollatz, Justin Blackburn, Megan Young

Mentor: Ernise Williams

The purpose of this review is to investigate the relationship between chronic disease and hospital readmission rates within the geriatric population. This is an important issue because by 2050 there are likely to be over 80 million people living in the United States above the age of 65. The increasing aging population, once coined the "silver tsunami," is at higher risk for comorbidities, including chronic diseases, which lead to a higher hospitalization rate. This topic is especially relevant to nurses because there may be a significant nursing shortage by 2020. Readmission rates could increase due to lack of staff to provide competent care to the patients. Nurses should know and understand the risk factors for readmission, such as chronic diseases, and discharge planning should have specific interventions to reduce readmission rates. Best practices from are integrative review of literature current will be presented.

Best Practices in Reduction of Compassion Fatigue in Registered Nurses

Troy DeYoung, Abigail Henke, Rachel Kuhnau, Jordan Redders

Mentor: Tracy Towne

This integrative review seeks the best research evidence to prevent compassion fatigue in the hospital setting. Compassion fatigue, or “burnout” is a common nursing phenomenon that has a negative impact on both the nurse and patient. It can be caused by the physical, mental, and emotional strains of work and leads to ill consequences such as an increase in medication errors and increased patient infections. Through the analysis of current research, we aim to provide the best methods of preventing this very common problem in nursing. The importance of recognizing compassion fatigue early is key to taking preventative measures. These measures include self-care, balance of work and life stressors, and proper communication. By educating nurses on taking these measures to prevent compassion fatigue, patient care can be greatly improved. This integrative review will present the best practices for reduction of compassion fatigue in registered nurses. Looking ahead to the future, interventions must be tested and evaluated to increase awareness of compassion fatigue to better control and decrease it in the hospital setting. Organizations and nurses must recognize compassion fatigue to help prevent financial and professional losses in the healthcare setting.

Chlorhexidine Dressings and Their Effects on CLABSI Rate

Megan Griffin, Keegan Kamps, Ashley Gher, Ivan Paradzikovic

Mentor: Ernise Williams

The purpose of this integrative review is to examine whether the use of Tegaderm CHG dressings as compared to the use of biopatch disc reduces Central Line Associated Bloodstream Infections (CLABSIs) within the hospital stay. Biopatch discs are currently used in many hospitals throughout the country, yet, there are still high rates of central line infections. The CDC estimates that 30,000 to 62,000 patients die every year from CLABSIs. The recent introduction of the one-step Tegaderm CHG dressing has the ability to be more effective than current methods. The best practice findings from this review will be presented.

Best Practices for Reduction of Surgical Site Infections in an Acute Care Setting

Alisha Nolden, Kate Palmer, Sarah Hendle, Maddie Weitz

Mentor: Tracy Towne

This presentation aims to identify the best methods of prevention for surgical site infections. Being that there are approximately 40 million surgeries performed in the U.S. each year, it is important to know the methods of best practice to improve the overall outcome of these surgeries. Issues surrounding surgical site infections are highly striking as they are some of the most common and costly surgical complications within the hospital setting. However, these incidences are also highly preventable. Within the presentation, the authors propose three areas of patient care; cardiovascular, orthopedic, and obstetrics, so as to explore complications surrounding surgical site infections in these major surgery areas. From there, the authors were able to identify modes of evidenced-based practice that allowed for an overall reduction of surgical site infections. This integrative review will display the best practices to help prevent the incidence of surgical site infections within the acute care setting. Through this review, it is hoped that healthcare professionals are able to gain insight into the prevention of surgical site infections.

Effective Treatments for Minimizing Recurrence Rates in Patients with Clostridium Difficile in the United States Acute Care Settings

Nicole Baker, Jessica Murray, Alena Schoeller, Myrissa Schubert

Mentor: Ernise Williams

Clostridium difficile infection (CDI), a severe form of diarrhea, is one of the most prominent healthcare-associated infections (HAIs). This infection travels easily from contaminated surfaces or unwashed hands to pass onto someone else. Centers for Disease Control and Prevention reports that nearly half-a-million people are diagnosed with the infection each year. CDI is typically treated with antimicrobial agents but approximately 24% of patients develop a second episode of the infection. The most effective treatment to shorten the period of illness and minimize the rate of recurrence is not yet known. Identifying effective treatments for this infection can lower hospital costs and decrease recurrences. Based on our integrative review of current literature, we will discuss best treatment options for treating CDI. If nurses can understand and advocate for the most effective treatments in controlling CDI, we can decrease the overall burden that this infection brings to healthcare and patients.

INVESTIGATIONS IN NURSING

11:10 AM - 12:30 PM, THE NONA MCGREAL ROOM

The Identification of Barriers and Facilitators to the Successful Delivery of Alcohol Brief Interventions by Patient and Family Education Nurses at a Large Academic Medical Center in Wisconsin

Melissa Perkins

Mentors: Maria Yelle, Roberta Pawlak, Melissa Heitzman

Level I Trauma certification requires adherence to Screening Brief Intervention and Referral to Treatment (SBIRT) set forth by the American Colleges of Surgeons (ACS). SBIRT includes screening tests and initiatives to improve the identification and management of unhealthy alcohol use. Organizations must demonstrate that at least 80% of all trauma patients are screened and receive an alcohol brief intervention (ABI). UW Health has set their goal at 90% of all hospital patients. ABIs are evidence-based practices designed to motivate individuals at risk of substance abuse to make changes by helping them understand their risky behavior. This project aims to increase the number of delivered ABIs. Specific aims include: 1) Gain an understanding of the barriers and facilitators to delivery of ABIs from the perspective of Patient and Family Education nurses; and 2) Apply FOCUS-PDCA (A3) framework to implement and assess practice changes to increase the number of delivered ABIs. Steps of the PDCA cycle taken include: 1) A brainstorming session utilized the fishbone diagram to identify root causes of the barriers and facilitators of successful ABI delivery; 2) Each month, a new rapid cycle improvement change was implemented with staff check-ins; and 3) After each cycle, data was re-evaluated for comparison. Based on the findings, processes will be altered as needed and reinforced for sustained implementation into daily practice. Conclusions/implications are pending, but expected to be completed prior to presentation. Findings will be utilized to improve system processes and develop a sustainable organizational process that meets required goals of ABIs.

Orientation and Professional Development Needs of the RN Transitioning to Ambulatory Care

Sabina Cheatle

Mentors: Yulia Semeniuk, Roberta Pawlak

Background and Significance

The Institute of Medicine report *The Future of Nursing: Leading Change, Advancing Health* (2010) recommends all Registered Nurses (RNs) complete a transition-to-practice program upon completion of their nursing degree or when transitioning to a new clinical specialty area. Research indicates support and training extending

beyond orientation in the form of a year-long post-graduate nurse residency program (NRP) facilitates a successful transition-to-practice. The American Academy of Ambulatory Care Nursing (AAACN, 2017) published the *Ambulatory Care Registered Nurse Residency Program* curriculum encouraging organizations to implement NRPs in the ambulatory care setting.

Purpose

The purpose of this Quality Improvement (QI) project is to identify the orientation and professional development needs of RNs transitioning to the ambulatory care setting at Group Health Cooperative of South Central Wisconsin (GHC-SCW).

Method

Purposive sampling was employed to obtain two participants, hired within the last five years, representing each clinic site. Ten participants were invited; eight accepted. A qualitative approach was utilized to collect data during semi-structured interviews. Interviews were recorded and transcribed verbatim. Thematic analysis, guided by Braun and Clarke's seven stage approach, using two reviewers (one the Principle Investigator, the second independent from the project) was utilized to identify themes.

Findings

Participants expressed satisfaction with the culture at GHC-SCW but felt orientation could be improved by strengthening the role of preceptors, extending orientation 1-2 weeks and providing more in-depth EPIC training. Post-orientation, a mentor who would provide continued support for the first 6 months of employment was seen as a positive step to facilitate transition and support professional development. All participants felt a transition-to-practice NRP program for new graduate RNs and experienced RNs transitioning to practice in the ambulatory setting for the first time is needed.

Conclusions/Next Steps

Findings will provide the foundation for customizing and implementing the AAACN *Ambulatory Care Registered Nurse Residency Program* at GHC-SCW. Additionally, improvements will be made to the current orientation process.

Improving the Capital Budget Process in the Ophthalmology Ambulatory Clinic Setting

Mary Reilly

Mentors: Tracy Towne, Roberta Pawlak, Ernise Williams

Background and Significance

The Institutes for Healthcare Improvement has identified three components to reverse the U.S. healthcare crisis: population health, patient experience, and per capita costs. Together these are referred to as the Triple Aim. This quality improvement project will evaluate the capital budget process in the framework of the Triple Aim. The objective is to develop a standardized tool to facilitate the selection of capital equipment in the ophthalmology ambulatory clinic setting.

Purpose of the Project

The purpose of this project is to develop a standard Capital Budget Process (CBP) to facilitate the prioritization and selection of capital budget projects to achieve the goals of the Triple Aim.

Method

This project had two phases; two rounds of face to face interviews using open ended questions. Each interview was approximately 40 minutes in length. Interviews were electronically audio-taped and transcribed for analysis. Phase one focused on evaluating the current state of the CBP. Phase two evaluated the tool to analyze capital budget items. The principal investigator analyzed and categorized the participants' responses. Themes identified in the first round of interviews were validated in the second round of interviews.

Findings/Conclusions/Next Steps

At the time of this submission, the data analysis is incomplete. Analysis will be completed prior to the poster presentation. Findings from the project will be shared with ophthalmology leadership to inform opportunities an improved CBP.

Pilot study: Learning to Use Eyetracking Equipment & Software to Support Future Research

Malina Manivong

Mentor: Lori Severson

Project funded by an Ebben Fund Grant for Undergraduate Student Research

Maps are useful for health education because they allow people to identify the presence of environmental hazards where they live, work, and play. While survey research provides insights into how maps influence health beliefs and decisions, most of this work lacks measures of what participants view as they answer survey questions. Eyetracking is a method for measuring eyegaze as people view information on a computer screen. The purpose of this pilot study was to learn how to use recently acquired eyetracking equipment and software to assess how participants used study maps as they answered survey questions. Four study maps from a previous study were used for the pilot study. Six participants were recruited. Participants were asked to think aloud as they used the maps to answer the questions. Quantitative results showed areas of the maps that were viewed, how long each area was viewed, the proportion of total viewing time that an area was viewed, and how many times an area was viewed more than once. It was helpful to compare the proportion (percent) of total viewing time across different maps and sets of questions. These comparisons suggested how maps were used for different cognitive tasks, and those survey questions that appeared to require more effort. Qualitative results from participants' verbalized thoughts provided further insights into how participants interpreted the maps to answer the questions. Further work is needed to develop methods for synchronizing results from quantitative and qualitative data for each survey question.

INVESTIGATIONS IN GENDER STUDIES

1:00 PM - 1:50 PM, LIBRARY 6

Theatre as Feminist Activism: Examining the Creation and Production of *The Penelopiad* and *The Rail Splitter* Through Performance Theory and Gender Theory Lenses

Mikayla Mrochek

Mentors: Lauren Lacey, Jeanne Leep

Project funded by an Ebben Fund Grant for Undergraduate Student Research

Using my own experiences as well as works by theorists such as Walter Benjamin, Elin Diamond, and Lauren Lacey, this research project trains performance theory and gender theory lenses on the act of theatre creation and production. Although a wide body performance analysis exists in the academic community, my goal with this

research is to bring two fields into connection that have not traditionally been bridged here at Edgewood College. Performance theory and gender theory can intersect in ways that provide a greater understanding of dominant cultural narratives and the systemic power through which they operate – which in turn, I hope, can provide a greater analysis of theatre as a source that is capable of producing feminist activism.

I examine two plays produced through the Edgewood College Theatre Department: the first is *The Penelopiad*, written by Margaret Atwood and directed by Jeanne Leep in the fall of 2017; and the second is *The Rail Splitter*, a new work written by Rick Cleveland and directed by Audrey Wax in the winter of 2018. My research paper and presentation analyze both the practical creation and realized production of these plays and how the methods utilized by the writers and actors, although different in practice, intersect to create feminist narratives. Those specific narratives include feminist revisionist narratives, which are a form of feminist analysis that critically engages with an often culturally-significant text and re-writes it in order to encourage a rethinking of its broader message; and collectivist narratives, which allow for multiple interpretations of a production and its creation all at once.

Constructions of Hijra Identity: Self Identification vs. Western Imposition

Amir Franklin

Mentor: Lisa King

Project funded by Multicultural Learning Fellowship

For my project, I will be researching the roles of hijras within Indian culture prior to British colonization and imperialization. Hijra, which is the term for biological males who identify as women, gender neutral, or agender, are an accepted gender category in Indian society despite the legacy of the West's imposition of a gender binary. My project will also examine hijras in contemporary Indian society--the ways in which they are accepted in some regards while simultaneously stigmatized and discriminated against.

I will look at Hijras as a social group through a feminist, theological, and intersectional lens, taking into consideration how they operate within social constructs such as race/ethnicity, gender, sex, and socioeconomic status. It is my goal to obtain a deeper understanding of how countries once organically embraced queerness, third genders, and other complex non-binary identities that were disrupted by anti-queer rhetoric that many colonizers introduced. This project will take into account how Hijras have been raced and gendered by the English invasion of India--how they are simultaneously marginalized due to their ethnicity and gender identity and expression within a heteronormative, white dominated culture.

Brettell, Caroline B., and Carolyn F. Sargent. *Gender in Cross-Cultural Perspective*. Prentice Hall; 4 Edition, 2004.

Johnson, Jean. "Shakti: The Power of the Feminine." *Asia Society*, 25 Apr. 2009, asiasociety.org/education/shakti-power-feminine.

Nanda, Serena. *Gender Diversity: Crosscultural Variations*. Waveland Press, 2014.

Vanamali. *Shakti: Realm of the Divine Mother*. Inner Traditions, 2008.

No Means No: A Behavioral Analysis of Reactions to Consent-Rhetoric, Hypermasculine Traits

Sabrina Fuller

Mentor: Tricia Egan

This research is an analysis of reactions to consent-rhetoric, the relationship between hypermasculine traits and the disinhibition of consent. Studies indicate that one in five women will be sexually assaulted while attending higher education, which puts a great number of students at risk. Campaigns highlighting the importance of sexual consent exist on most college campuses around United States, and evidence suggests that these poster campaigns are effective in increasing awareness and inducing conversations about consent. Mosher and Sirkin (1984) also found a relationship between hypermasculine traits and sexual violence. However, little is known about how the public reacts to consent-rhetoric in a naturalized, non-academic environment. In this study, participants were exposed to posters promoting consent in a public eatery during typical hours of nightly high activity (8PM-2AM), and their behavior was observed for patterns, resulting in over twelve hours of observation. These patterns included desensitization from female participants, and that the presence of alcohol and hypermasculine traits both increased passive and physical interaction.

INVESTIGATIONS IN TECHNOLOGY AND BUSINESS

2:00 PM - 2:50 PM, LIBRARY 4

An In-Depth Look at the Implications of Cybersecurity

Imane Chkhoukout

Mentor: Greg Alexandrian

In a world where technology and Internet have taken over our lives, cybersecurity has become an important concept. Nowadays, we are obliged to understand what cybersecurity is and the implications that it has on our lives. Cyber-attacks may have devastating consequences and have financial, political and other types of repercussions.

This research aims to increase people's awareness about cybersecurity and prevent them from being the victims of eventual attacks. We examine scientific and other publications as well as attacks of the past in order to illustrate the danger, and analyze evidence so as to provide ways to prevent the attacks from taking place.

To further deepen the understanding of how cybersecurity has become a crucial subject matter, we will be providing technical overviews of two vulnerabilities: one that takes place at the hardware level, and one that occurs at the software level. This, in particular, will include the Intel Spectre hardware based attack. This recent occurrence showcases how threats evolve and the way attackers keep innovating. This is one case where perceived improvement of functionality caused a security threat. For the software level attack, we will give a detailed explanation of how stack buffer overflows occur and how these may be exploited.

Finally, the conclusion will focus on the best practices that tech savvy people should keep in mind while designing and implementing systems to avoid potential breaches.

Blockchain: The Technology behind it, and its Applications

Suha Alaqil, Luke Miller

Mentor: Greg Alexandrian

The blockchain is a new database technology that is the platform behind cryptocurrencies such as Bitcoin. A blockchain of the Bitcoin is a continually growing, decentralized, and distributed ledger. Digital events/transactions on a blockchain are recorded in intervals. Groups of transactions within those intervals are assembled into blocks, each of which is linked to the previous block. Each block is recorded in a verifiable and permanent way. This verification is done by consensus of most of

the participants in the system. Once the record verified it cannot be edited or deleted. There are many digital currencies based on blockchain, but the most popular example is Bitcoin.

In this research we are looking at a host of printed as well as online scientific and other publications in order to uncover the underlining principles of this exciting technology. We will build our own simple blockchain and describe in simple terms how this innovation works, as well as how it can potentially change the world. Digital currency is not the only application that uses blockchain technology. Already today, there are many different applications that have been implemented using it. Some applications involve cloud storage, smart contracts, identity management, and enhanced security. We will show that it is feasible to expect a lot more to come in the nearer future.

The Legend at Bergamont Improvement Opportunity

Zach Hentrich

Mentor: Fazel Hayati

Legend at Bergamot is a private golf course in Oregon, Wisconsin. Membership at the golf course is the main source of revenue and the marketing research shows that the largest source of membership is referrals by current members. The research also shows a strong relationship between member satisfaction level and new referrals. The data shows that although memberships in various venues have remained stable in recent years, there has been a dramatic decrease in men's night participation, a major contributing factor to member satisfaction. The purpose of this research is to investigate areas of improvement to improve participation in men's night programming. The model for this research is based on the Plan-Do-Study-Act (PDSA) where improvement models will be simulated and piloted. The results will be evaluated based on the principles of statistical process control. The research is in the planning and current situation analysis and various simulations are under consideration.

INVESTIGATIONS IN GENDER, RACE, AND CLASS IN FRENCH CINEMA

2:00 PM - 3:00 PM, PREDOLIN 122

Intersections of Gender, Race, and Class in Contemporary French Cinema

Emil Radisevic, Haley Brooks, Lydia Dean

Mentor: Sayeeda Mamoon

We will explore the representations of diversity and non/inclusion in contemporary French culture through the lens of cinema. In our study, we will pay close attention to the intersections of race, class and gender in the portrayals of different strata of French society. Our project will review films by immigrant filmmakers and works by women directors with the view to investigate the play of power and privilege in the movies. We will discuss cinematic productions such as *Inch'Allah Dimanche* and *Les Intouchables*.

INVESTIGATIONS IN SOCIAL PSYCHOLOGY

2:00 PM - 3:45 PM, PREDOLIN 115A

Mentor: Joan Schilling

Gender Roles in Harry Potter Films: A Content Analysis

Elizabeth Keller, Sydney Roe, Sarah Meffert, Brianna McCann

Popular books and films offer powerful gender role models for children and may perpetuate social norms for male and female behaviors. In the past, male role models have been represented most often and with most power in children's books and films (McCabe, J., Fairchild, E., Grauerholz, L., Pescosolido, A., Tope, D., 2011). The Harry Potter books and films are seen to offer new and more equitable portrayals of female and male characters. The present study does content analyses of four of the Harry Potter films to determine if this is true. The analyses will analyze the roles and actions of male and female characters, Hermione, Harry, Ron, and McGonagall. The traits chosen were based on Stephens' schema for masculinities and femininities (1996) and other sources and include inner strength; emotionality; competitiveness; cooperation; sensitivity; risk taking, etc. The films are *Harry Potter and the Sorcerer's Stone*; *Harry Potter and the Order of the Phoenix*; and *Harry Potter and the Deathly Hallows, Parts I and II*.

McCabe, J., Fairchild, E., Grauerholz, L., Pescosolido, A., Tope, C. (2011). Gender in Twentieth-Century Children's Books: Patterns of disparity in titles and central characters, *Gender and Society*, 25(2), 197-226.

Stephens, J. (1996). Gender, genre, and children's literature, *Signal*, 79, 17-38.

The Effects of Belief Perseverance on Attitudes toward Gun Control in the Face of Contradictory Evidence

Lamin Ceesay, Noble Freels, Erinn Preston, Tori Wiskow

Ross, Lepper, and Hubbard (1975) did research showing that people tend to retain beliefs even when they have been presented with evidence disproving those beliefs. Studies of this phenomenon, called Belief Perseverance, have been replicated many times. In the basic paradigm, participants are randomly assigned to conditions in which they are shown vignettes showing fabricated evidence either supporting or refuting a belief (e.g., vaccines cause autism.) Participants are then told that the evidence was false; made up for the purposes of the experiment. Participants tend to retain the false beliefs even when they've been shown evidence that refutes them. The purpose of the present study is to see if belief perseverance will occur even with an issue about which people hold preexisting and polarized beliefs: Gun control. Participants recruited through the researchers' social media contacts will complete a Qualtrics survey. They will be asked to answer Yes, they approve of gun control or No, they disapprove of gun control. Gun control will be defined as the restriction or regulation of the sale, purchase, or possession of firearms through licensing, registration, or identification requirements. They will also indicate the strength of their approval or disapproval. Each participant is then assigned to a condition that is opposite their opinion on gun control and given information that refutes their views. They will then be asked questions to see if their original beliefs have perseverated in the face of contradictory evidence or have moderated to agree with the evidence. This differs from traditional belief perseverance research in that it assumes that a total change in beliefs would probably not occur for such intensely held beliefs, but that moderation in beliefs may be possible.

Ross, L., Lepper, M. R. and Hubbard, M. (1975) Perseverance in self-perception and social perception: Biased attributional processes in the debriefing paradigm, *Journal of Personality and Social Psychology*, 32, 880-892

The Relationship between Smartphone Use and Mental Health in College-Age Participants

Zach Gaines, Alli Gordon, Michelle Walmer, KC Yang

The use of smartphones in our society has become problematic for many millennials and extreme use may be causing social isolation and other psychopathologies. Research done by Demirci, Akgonul, and Akpinar (2015) in Turkey found that depression, anxiety, and sleep quality were associated with excessive smartphone use. Similar results were found among college-age students in Iran and Korea. The purpose of the present study is to replicate the Demirci, et al. (2015) study using American college-age students. Participants will be male and female college-age students recruited through present researchers' social media contacts. Through Qualtrics, they will complete a Smartphone Addiction Scale – Short Version (SAS-SV), which measures degree of smartphone use, the Center for Epidemiologic Studies Depression Scale, and the Beck Anxiety Index. The present researchers hypothesize that there will be a positive correlation between scores on the Smartphone Addiction scale and scores on the measures of depression and anxiety.

Demirci K, Akgönül M, Akpinar A. (2015). Relationship of smartphone use severity with sleep quality, depression, and anxiety in university students. *Journal of Behavioral Addictions*, 4(2), 85-92.

Parenting Norms for Supervising Children and Estimates of Risk

Lauren Cruz, Abbey Horsens, Carly Lewis, Jaime Runde, Vanessa Segura

A study done by Thomas, Stanford, & Sarnecki (2016) found that Participants greatly overestimated the number of children being abducted or harmed by strangers. This may be because of the availability heuristic due to media coverage of such instances. This has probably contributed to the development of a social norm that children must be under the direct supervision of a caretaker at all times. This norm has developed even though the actual risk of this happening in the United States is just 1 in 1.4 million annually (Thomas, et al., 2016). Other variables also influence the amount of blame people place on parents for leaving their child unattended. The present study will examine two of these variables: Age of the Child (10 months, 4 years, and 8 years old) and reason for the parent leaving the child alone (unimportant/unnecessary or important/necessary.) The study will also examine whether Participants will judge that the child is in more danger if the parent has left the child alone for an unimportant/unnecessary rather than for an important/necessary reason. Participants will be recruited through the Researchers' social media contacts to read six scenarios on Qualtrics in which a parent leaves children of the 3 different ages alone for either an unnecessary/unimportant reason (e.g., working out at a gym) or a necessary/important reason (e.g., working for extra credit for food.) The hypotheses are: 1) That parents will be more blamed for leaving a younger child alone and for having an unimportant/unnecessary reason for doing so; and 2) Children will be seen as being more at risk if the parent leaves them alone for an unimportant/unnecessary reason.

Thomas, A.J., Stanford, P.K., & Sarnecka, B.W. (2016). No Child Left Alone: Moral judgments about parents affect estimates of risk to children. *Collabra*, 33. <http://www.collabra.org/articles/10.1525/collabra.58/>

Does Humor Have an Effect on Stress?

Grace Carpenter

College can be one of the most stressful times in one's life. The freshman year is particularly stressful in terms of pressures to succeed, leaving home, exams, establishing a social life, dealing with college costs, etc. A study by Hurtado (2010) found that 30.2 percent of freshman feel "frequently overwhelmed by all [they] have to do. Previous research has shown that humor can reduce stress by modifying stress hormones (Nevo, Keinan, & Teshimovsky, 1993). The present study was conducted as part of the COR I course: *Humor: Is it Always a Laughing Matter?* The Participants were 15 Edgewood College freshmen. They were asked to estimate their stress levels on a scale of 1 to 10 for seven consecutive days, Monday through Sunday. After estimating their stress they were asked to watch one short, humorous video of their choice, and then to again estimate their stress levels. It was found that watching the video reduced stress levels from an average of 5.7 to an average of 4.1 across all Participants on all days. An interesting finding was that stress levels were highest on Mondays, declining till Saturday, with a spike on Sunday.

Hurtado, Sylvia. (2010). *The American freshman: National norms Fall, 2010*. Higher Education Research Institute at UCLA, 2010, <https://www.heri.ucla>.
Nevo, O., Keinan, G., & Teshimovsky-Arditi, M. (1993). Humor and pain tolerance. *International Journal of Humor Research*, 6(1), 71-88.

The Use of Humor in Counseling

Maddie Harmening

Counselors use many tools to help their clients. One of the tools used is humor. The current study hopes to answer the question, "Do Counselors use humor in Counseling and if they do, why?" The research was done as part of a COR I course: *Humor: Is it Always a Laughing Matter?* Previous research has shown that Counselors do use humor to relax clients, facilitate communication, help clients perceive the world's absurdities, and offer the client a less painful perspective of a difficult problem (Johnson, 2009). The current researcher interviewed seven counselors, voice recording most of the interviews, and asking whether or not they used humor in counseling, if Yes, Why and how, and if No, why not? Results showed that all of the counselors did use humor often. Some common reasons given for using humor were: building or forming stronger relationships, bonds, rapport, and connections; inducing relaxation, diffusing tension; and lightening the mood. The Counselors also indicated that humor must be used carefully and appropriately.

Johnson, L. C. (2009). Humor in Psychotherapy. *Positive Psychology News*, <http://positivepsychologynews.com/news/laura-lc-johnson/200906252693>

Effects of Disparagement Humor on Perceptions of Gender and Ethnic Stereotypes

Kim Helm-Quest

Family Guy is known for its offensive disparagement humor and, therefore, has been divisive. The reliance on humor based on stereotypes is said to both challenge the stereotypes by using hyperbole and making people become self aware, and perpetuate stereotypes through the confirmation bias by causing viewers to take the depictions as evidence for their beliefs. There may also be a relationship between the enjoyment of disparagement humor and the choice of college major (Dovey, 2017.) The present study was done as part of a COR I course: *Humor: Is it Always a Laughing Matter?* The main goal of the study was to find whether watching a video of disparagement humor would change the Participants' views of the stereotypes of Asian and Women Drivers. Participants were Edgewood students recruited through e-mail. Six students responded. These students were sent the research materials through Survey Monkey. They were first asked to indicate on a scale of 1 to 100 their perception of women drivers and of Asian drivers. They were also asked their major. They then viewed an embedded video of a *Family Guy* episode in which an Asian Woman driver caused a car accident. Participants were then asked their level of enjoyment of the video, their degree of agreement with the stereotype presented in the video, and whether they thought that the type of humor presented in the video challenged or perpetuated the stereotypes. Four of the Participants did not agree with the stereotypes and all Participants said that the video did not change their views on women or Asian drivers. The researcher indicated that the major limitation of the study was the small number of respondents.

Dovey, D. (2017) What college courses do psychopaths choose? Dark triad personality most likely to have this degree. *Medical Daily*, Newsweek Media Group, May 4, 2017.

INVESTIGATIONS IN LEARNING, BELIEFS AND ACTION FOR THE COMMON GOOD

2:00 PM - 3:50 PM, THE NONA MCGREAL ROOM

Mentor: John Leonard

The Pains of Forgotten Victims of Agent Orange from Vietnam War: Call for Actions

Lien Do

Although it has been 50 years since the U.S. forces sprayed 20 million gallons of herbicides over the jungles and croplands of Vietnam to defoliate the trees and crops, Vietnamese men, women, and children are still suffering from “Agent Orange” the most toxic of all the dioxins and dioxin-like compounds. Agent Orange remains for generations in the soil and poses danger to people who touch it or drink water contaminated by it. Agent Orange causes many kinds of severe diseases including cancers, neurological disorders, reproduction disorders, and birth defects. The victims of Agent Orange are extremely vulnerable. Many of them cannot do anything for themselves and need 24-hour care.

Having worked for three years with victims of Agent Orange in my local village, I still feel so sad and painful for what we, human beings, have done to harm each other in the past. My compassion for the victims of Agent Orange in Vietnam motivated me to do extensive research on Agent Orange, to learn how it affects people and the environment and what we can do to alleviate the suffering of our brothers and sisters. At the same time, I explored the moral and ethical reasons that oblige us to care for these marginalized and forgotten people and in doing so, help build a more just, loving, and compassionate world.

The Former Slaves of Lake Mills: A Study of African Americans in Rural Wisconsin

Caitlin Downey

This presentation reports on my year-long investigation of the lives of six families of former slaves who lived in my hometown – Lake Mills, Wisconsin – from the end of the Civil War until about 1900. It also includes a reflection on how my own learning, beliefs and action as an historian can contribute a more complete, equitable historiography and so serve the common good.

I have been investigating why these former slaves chose to settle in Lake Mills, how and to what extent they were able to integrate into a majority-White community, and why they eventually left. Among the sources used for my research are manuscript – and population – censuses from 1840 to 2010; articles from local newspapers, vital records, and minutes of the Lake Mills city council.

Throughout the research process I have partnered with Dr. Andrew Witt, my project adviser; C. Edward Lawrence, a descendent of one of the families; the L.D. Fargo Public Library in Lake Mills; the Lake Mills-Aztalan Historical Society; and the Dodge-Jefferson Counties Genealogical Society.

Presently, there is little written about the history of African Americans in Wisconsin, and even less that focuses on African Americans in rural areas prior to the 20th century. My senior thesis attempts to fill in that gap in Wisconsin's Black history and contribute to the historiography of Black Americans in the Midwest as a whole.

My presentation will be in the form of a PowerPoint with accompanying notes and bibliography.

Grow Your Green

Kristel Renn

The idea for *Grow Your Green* stemmed from conversations with low-income youth at the Boys and Girls Club. What they wanted, more than anything, was an opportunity to make money. As they were too young to get a paying job in Madison, Wisconsin, we would need to find a clever way to create opportunities for them that were sustainable and lasting.

The Boys and Girls Club location in a food desert sparked the idea to solve two problems with one solution: we would create a sustainable agriculture business, bringing local, affordable produce to the community and offering a job opportunity for the youth that would work it.

The focus of this project is entrepreneurship through sustainable agriculture; working with low-income youth to provide skills and knowledge to create, build, and sustain an eco-friendly, agricultural business. The project works with Summit Credit Union, STAR Credit Union, The Boys and Girls Club of Dane County. Funding will be provided through grants from SARE and the Willy St Coop.

Among the sources used to inform and reflect on this project are *The Common Good and Christian Ethics*, by David Hollenbach (Cambridge, 2002); *Drawdown: The Most Comprehensive Plan Ever Proposed to Reverse Global Warming* by Paul Hawken, (Penguin, 2017) and the community- garden experience of “Grow Food, Grow Hope” at Wilmington College, Wilmington, Ohio.

INVESTIGATIONS IN HEALTH CARE ETHICS

3:00 PM - 3:50 PM, LIBRARY CONFERENCE ROOM (LOWER LEVEL)

Defining Citizenship and Ethical Immigration Policy

Kasey Syverson

Mentor: Fred Harrington

Sovereign states have the right to unilaterally determine which individuals are granted or excluded from within their borders. This is, in fact, considered essential to their sovereignty – a concept that is universally accepted and adopted by modern states. The state sovereignty view on immigration policy holds that the movement of individuals across borders need only be justified to those already citizens of the state. The increased prevalence of migration throughout the globe, however, raises essential questions: which individuals should be permitted entry, and which authority can legitimately permit them? Recent philosophical literature has argued in favor of the democratic theory of legitimization, with the premise that the authority behind border control must be democratically justified to foreigners as well as to citizens, in political institutions where both foreigners and citizens can participate. Based on an analysis of David Miller's argument in favor of the state sovereignty view and Arash Abizadeh's support of the democratic theory of political legitimization, this paper explores what it takes for a regime to have a legitimate border control and immigration policy. Ultimately, this paper expands on the arguments of Miller and Abizadeh by suggesting what should be considered the necessary requirements for an individual to be recognized as a member of a state. This conclusion is based on the underlying argument that personal autonomy, which is innately possessed by an individual, should be prioritized over other values, such as sovereignty, that can be lost due to the influence of outside factors.

Advance Care Plans: Agents of Autonomy or Stripping Patients of Current Interests?

Kami Doberstein

Mentor: Fred Harrington

Advance care plans are a means by which patients can anticipate and analyze future potential health situations and make competent decisions about preferred health care treatments in each situation in the event of a future potential state of incompetency where they can no longer express those preferences themselves. When individual patient autonomy is given the highest consideration in advance care planning practices, the patient's wishes are honored, and the individual autonomy of the patient is preserved and extended into future incompetent states. Using support and evidence from philosophical publications by Nancy Rhoden, Sharon Ikonomidis, Peter Singer, Alan Goldman and others found through a literature search, this research paper will defend the argument for upholding patient autonomy through advance care plans in order to demonstrate the purpose of advance care plans and the importance of their continued use in the health care setting. This argument will be defended against other claims, as raised by Rebecca Dresser, John Robertson, Donna Chen and others, that say advance care plans should take into greater consideration the interests of the individual that will be expressing the incompetent patient's wishes, or that advance care plans do not accurately reflect a patient's current best interests in states of incompetency, which are potentially different than the interests of the patient when they competently placed the advance care plan.

The Role and Value of Child Life in Pediatric Behavioral Health

Kathryn Friday (*Honors Scholarship Project*)

Mentor: Katie Glass

Child life specialists have not traditionally been included in the treatment plan of pediatric behavioral health patients, but recently, child life specialists have been advocating for the use of their interventions with this population. The importance of child life for the psychosocial needs of the hospitalized child and family has been thoroughly validated, but behavioral health patients are sometimes seen as an exception. This is due to perceptions that child life will interfere with treatment and that child life specialists are not well-educated and prepared for working with this population. The main focus of this research is to study how child life specialists' unique knowledge and skills can be used alongside the rest of the multidisciplinary team to better serve this population.

In researching this topic, I first used research guides to find scholarly literature that focuses on the psychosocial and emotional needs of pediatric behavioral health patients, and then applied child life theories and best practices to see how child life could help meet those needs. Second, I reached out to Certified Child Life Specialists who work with the behavioral health population through the national Association of Child Life Professionals. I interviewed these professionals in order to learn how several children's hospitals' child life programs work with the pediatric behavioral health population. Throughout this research, has become clear that contrary to some beliefs, child life specialists are well-suited to work with behavioral health patients due to their background and education in child development, and can offer services that will complement the rest of the multidisciplinary team in the treatment of this population.

INVESTIGATIONS IN ART

4:00 PM - 4:40 PM, SONDEREGGER ATRIUM

History: A Wearable Art Approach

Sarah Weh

Mentor: Shad Wenzlaff

My creative inquiry will take the form of a curated exhibition, staged in the Sonderegger Lobby during the month of April. The opening night will consist of a gallery talk, co-sponsored by myself and one of my mentors, Shad Wenzlaff, during the week of Edgewood Engaged. This exhibition is entitled "History: A Wearable Art Approach". The gallery talk will focus on the process by which I encounter sustainable fashion. The opening of the presentation will focus on my creative work process, and how I incorporate unconventional materials in my wearable art. I will also discuss my goals for creating garments from repurposed materials. I employ eco-fashion principles throughout the entire creative process. This design philosophy is more than a trend within the broader sustainability movement. The second half of the gallery talk will present the history of the eco-fashion movement through today. Its origins in the late 1980s, through the efforts of the Patagonia and ESPRIT labels, are still seen as important influences on the wearable art community. Together, we will present key philosophies embraced by ecologists, whose work launched the Organic Cotton Conference in 1991, which is now a web platform. Through the broadening of the eco-fashion movement evident in the efforts in recent years by the Sustainable Apparel Coalition, the Higg Index, and fashion designer Stella McCartney, it clear that up cycled wearable art is continuing to make an impact on the fashion and ecology communities.

Art and Architecture in Florence: The Public Memory of the Medici in Florence

Alyse Peters (*Honors Scholarship Project*)

Mentor: Bonnie Sierlecki

Being Florence, Italy's town square, the Piazza della Signoria possesses a tremendous amount of history and art. The Piazza della Signoria dates back to 1290 when Arnolfo di Cambio constructed the Palazzo Vecchio, the town hall that overlooks the city center. The Palazzo Vecchio housed many of Florence's political figures, however, the statues and monuments that reside outside the palace publicly display the story of political influence that has impacted the structure and aesthetic of modern-day Florence. Cosimo I Medici is arguably the most prominent leader in Florence's history. Cosimo I and his family's economic superiority and social power influenced Florence's government, art and architecture, and ideals of the family today. The prestige and historical prominence depicted by Cosimo I overshadows how his role as a leader in Florence evolved and created tense relationships with other leaders in Florence. Using the theory of public memory and making a comparison to the Jesse Owens Memorial Museum in the United States, I will study the Medici-influenced statues to determine the public's general opinion of Cosimo I and his family and their role in shaping Florence's art and architecture.

Key words: public opinion, rhetoric, Piazza della Signoria

4:40 PM - 5:00 PM, SONDEREGGER 108

Spirit Photography

Claire Kittel

Mentor: Sarah Stolte

Since its inception in the Victorian era, photography has complicated the difference between documentary truth and illusory creation. Because photography is considered a true replica of nature, it is, and was, taken as documentary truth. This becomes a problem because of the new reliance on scientific evidence as a search for truth, which created a more steadfast belief in photography as documentation. Spiritualism used photography as evidence for truth, which brought about a widespread phenomenon, Spirit Photography. Spirit Photography is often mentioned in literature, but usually as a fad. Although Spirit Photography was a short-lived production, spirits "found" in photographs are still believed today. This paper and show studies Spirit Photography, its basis in Spiritualism, and its relation to the idea of photographic truth. Every photograph in this exhibition exemplifies how Spirit Photography grew, was established, and eventually declined. Current scholarly

debate centers on the intention of the photographer to deceive; however, what is more interesting is the customer's belief in the idea of photography as proof of an afterlife. This exhibition thus traces a timeline from implicit belief to skeptical questioning, and also takes note of the ghost photography used intentionally for entertainment purposes during the same time period. The ubiquitousness of photography today makes it difficult to discuss the idea of questioning reality in photographs, which is considered commonplace today. This chronological exhibition is important as a history of how people historically engaged with questioning the reality of photographs.

HONORS RECEPTION

5:30 PM - 6:30 PM, THE NONA MCGREAL ROOM

Open to all students enrolled in the Honors Program

Mentor: Bonnie Sierlecki

THURSDAY
APRIL 26, 2018

INVESTIGATIONS IN DRAMATURGY

10:00 AM - 10:50 AM, DIANE BALLWEG THEATRE

Developing Methodology and Character

Christopher Hansen, Kenzie Meruci, Alan Lau Brown, Abby Hadley

Mentor: Susan Nanning-Sorenson

Among the many challenges that face actors in the early stage of rehearsing a play is that of researching, and in some cases, creating, a “back story” for their character. In order to create a truly believable character, actors must seek the answers to many questions as a part of this process such as:

- Is the character based on a previous existence from history or literature?
- Where does the character reside both during and before the text of the play?
- What was the character actively involved in prior their beginning moments onstage?
What were they involved in a week before? A month before?

Most productions include in their production staff, a Dramaturge. This person is assigned to research the background of the play, including its origin, setting, and language. The Dramaturge will seek to define words and phrases that might be unfamiliar, historical, political and social norms of the time period wherein the play resides that might affect the action and choices of the characters. The Dramaturge shares the results of their research during the early rehearsal phase, and this information frequently assists actors in finding some of the answers to their questions, but rarely provides enough background for the actor to fully “flesh out” a believable character.

One portion of our panel will focus on the process and findings of Christopher Hansen, the student Dramaturge assigned to the production of *As You Like It*. Another portion will focus on the methodology used by three student actors in the production, Kenzie Merucci, Laura McMillan, and Mikayla Stelzel as they built the background for their characters. These students will also discuss how their research was applied during the rehearsal process of the production. In addition, students will also demonstrate one scene and one monologue from the production.

INVESTIGATIONS IN DIGITAL ROMANTICISM

11:00 AM - 11:50 AM, LIBRARY BOARDROOM

Digital Investigations into Literary and Cultural Themes

Alyssa Allemand, Rachel Howe, Bonni Briggs

Mentor: Ashley Byock

This panel includes students who completed critical cultural studies projects in a digital platform called *Scalar* for English 281 in fall 2017. English 281 is the English majors’ methodologies course, which introduces students to the history of literary and cultural theories, as well as the relevance of certain theories in today’s culture. The content of the course incorporates different lenses in which we should view social issues and complex ideas through. The projects in this student panel will demonstrate how digital tools can be part of a critical cultural analysis focusing on examples of two projects students completed this semester. One project involved creating a digital critical annotated bibliography for a critical methodology – tracing the history, locating foundational texts, and analyzing ways they are applied in modern culture. The second project used critical lenses to analyze today’s culture with a focus on analyzing race, gender, sexuality, and other issues.

POSTER SESSION

2:00 PM - 3:30 PM, ANDERSON AUDITORIUM AND PREDOLIN LOBBY

Refreshment and Reception

PEOPLE’S CHOICE AWARD FOR BEST POSTER

Please note the number assigned to each poster; this is the number you will submit to vote. Ballots are available at the entrance to Anderson Auditorium between 2:00-3:05 PM. Ballots must be cast in the ballot box before 3:15 PM. Boxes are located at the entrance to Anderson Auditorium. The winner will be announced at 3:25 PM.

Attitudes toward the Cutting Edge Program and Students with Disabilities

Rachel Bucheger, Caitlynn Suiter

Mentor: David Lambert

Purpose: This research aims to be the first phase of a comprehensive study examining the impact of the Cutting Edge (CE) Program at Edgewood College. The primary objective of this research is to analyze the attitudes of undergraduate students about students with disabilities (SWD), as well as about student level of awareness of the CE Program and the support it provides. We hypothesize that students who report more frequent contact with SWD will report more positive opinions toward SWD and the CE Program. The findings of this study will then be shared with the CE Program director to serve as an indicator of inclusive attitudes about SWD on Edgewood’s campus.

Procedure: The current study is aimed at first and second year students at Edgewood College. Participants will be directed to an online survey. This survey will include

questions regarding attitudes toward SWD (adapted from Westling et al., 2013) and the CE Program itself, including questions regarding participant knowledge of services provided by the CE program, student worker/staff positions and responsibilities, and perceived levels of support given to CE students.

Results: In the previous phase of our study, in which third and fourth year students at Edgewood College were surveyed, we found that increased frequency of contact was correlated with positive attitudes about SWD and the CE program. In the current study, we expect to find a similar correlation, but perhaps not as strong as found in the previous study because first and second year students have not been immersed in the campus climate for the same length of time.

Mood and Lexical Tasks

Caitlynn Suiter, Bret Stalcup

Mentor: Ferrinne Spector

This study will examine attachment styles as they relate to cognitive decision making after eliciting a positive or negative mood. Attachment styles are used to assess attachment-related anxiety and attachment-related avoidance (Fraleigh, Waller, & Brennan, 2000). Westermann et al. (1996) find results from mood inductions can reveal how emotion, cognition, and behavior are interconnected. In this study, the mood induction procedure (MIP) will involve participants reading both positive and negative vignettes during two phases of the experiment. Reaction times from a lexical decision task will be utilized where participants will distinguish between a positive or negative word, half will be attachment-relevant words. This type of cognitive task will require participants to react quickly to the words presented to them, which will allow us to examine whether the mood induced and attachment style of the individual has an influence on their cognitive processing. It is well established that reaction times in lexical decision tasks are influenced by affective priming. In other words, when participants experience a particular mood prior to the task, they will likely respond faster to words that are congruent with the mood induction they experienced (Kissler & Koessler, 2010). Given the current research on attachment styles, we can expect that participants who have a secure attachment style will more quickly identify positive words, particularly words that are attachment-related. Participants with less secure attachment style may be more easily influenced by the mood induction; thus we expect them to respond more quickly to mood congruent words.

An Immersion into Typography

Allison Berryman (*Honors Scholarship Project*)

Mentor: Carrie Firman

Typography has a long history in graphic design and continues to be a primary element of visual communication. My research questions include: What are the key events in the history of typography? What are the elements that make up a typeface? What are some of the most famous fonts used today, and who are their designers? What are the current trends in typography? What are the rules for designing a typeface? And can I design and develop my own typeface?

To explore these questions, I have completed extensive research into the history of typography, from when it first started with the most basic form of communication "pictures, or hieroglyphs" to the creation of typefaces today that work for both print and digital purposes. I have analyzed letterform anatomy – what makes up a letter – and how typefaces are classified. Regarding popular fonts, I have identified some of the most popular and well-known fonts, ranging from Helvetica to Times New Roman to Futura, as well as the designers behind them. As typography is evolving every day, current trends and the reason behind them is something I also investigated with this immersion into typography –creating a list of the eight biggest trends of typography in 2017. And to finish my research, I described the best practices and rules for designing a typeface, and then applied those to my own typeface design, resulting in designing and developing my very own typeface.

Documenta 1: The Reestablishment of Modern Art in Western Germany

Kaitlyn Stielow

Mentor: Shad Wenzlaff

The first Documenta exhibition occurred in Kassel, Germany in 1955, an era of German history defined by the recovery from the devastation of World War II. Documenta continues to be held every five years, although it has been significantly expanded to include other venues and a wider range of media and styles of art than were initially exhibited. This research takes a critical look at how modern art was ostracized in Germany at the time; and how Arnold Bode, director of Documenta 1, and the artists who were represented in this exhibition were framed to be "the answer to the trauma that resulted from the original antimodernist smear campaign" (Grasskamp, 1994). Bode and these artists were clearly referencing the Degenerate Art show of 1937. By looking at art criticism that references these exhibitions, I frame the question of what Documenta represented, and continues to represent. By defining its aims, I will explore the role of art and art exhibitions as a way to bring back modern art to western German culture and political life. The graphical design of my poster is inspired by the collection of posters that comprised each Documenta.

Influences on Quick Judgments of Emotionally Expressive Faces

Bader Batarfi, Enass Almetery, Eric Fredrick

Mentor: Ferrinne Spector

Delusion-like ideation and social anxiousness are traits linked to quick and potentially biased decision making (Johnstone et al., 2017). For example, feeling anxious during a social interaction (social anxiousness) may induce a false perception of how others view you (delusional ideation) which can lead to bias in decision making about the event. The objective of this study was to investigate how individual differences in cognitive patterns influence the likelihood of making a quick judgment in an emotional context. Specifically, how non-clinical variations in delusional ideation and social anxiousness influence the likelihood of making quick decisions about the emotionality of faces. Participants completed the Peters Delusion Inventory (Peters et al., 2004) and Social Interaction Anxiety Scale (Mattick & Clarke, 1998) and a modified version of a classic probabilistic reasoning task - the Jumping to Conclusions task (JTC). In the original JTC task, participants draw blue and red marbles one at a time until they make a decision about whether the marbles come from a majority blue or majority red jar (Tottenham et al., 2009). In our modified task, participants see positive or negative faces one at a time until they make a decision about whether the faces came from a majority positive or majority negative group. We predict that people with high social anxiousness and/or high delusional ideation will need fewer faces to make a decision about the prevalent emotionality in a group of faces. This study will help to understand how cognitive patterns influence interpretation of facial expression in social interactions.

Exploring Art Therapy in Special Education for Young Adults

Patricia Harris

Mentor: Janice Havlena

This project researches how art therapy can be used to meet the needs of young adults in a special education programs. Art therapy is not in widespread use with this group, although it has potential to meet specific program goals. A combination of library research review of the literature and field work has been used.

The research methods for the literature review have focused on peer-reviewed studies in the related areas of community-based art programs for individuals with special needs and art therapy. For the field work, three sites were selected to visit, two in South Central Wisconsin and one in London, England. The UK is relevant because the development of art therapy there predates its development in the US, and historically has included art therapy with special needs. Many perspectives are being developed in art therapy in the UK that could benefit programming within the United States.

For each program studied, both through literature review and field work, information regarding mission, program, goals, and the role of art-making, has been gathered, analyzed and compared. Program directors responded to written questions and in-person consultation to gain an understanding of how their program achieves its goals. Practices that lead to increased independence for participants included a strong sense of community, attention to social and emotional needs, and development of skills that function as healthy coping mechanisms. These findings will be used to inform an art therapy model for a school district in this region.

Validation of a Modified Cellulase Assay

Bailey Eschmann, Matt Keller

Mentor: David Kretchmar

Cellulose is an important resource in the production of ethanol for the use of biofuels on an industry scale. Cellulase is an enzyme that converts cellulose into glucose. This cellulase assay can be used as an important educational tool when teaching the function of enzymes. A modified assay was successfully developed by former student, Noemi Rodriguez, using 25% cotton fiber typing paper as a substrate. This is a cost-effective alternative to the high cost microcrystalline cellulose traditionally used in these assays. The research project for CHEM 489 section 003 will attempt to validate this assay based on the Michaelis-Menten model, and to determine the enzyme kinetic model. The Michaelis-Menten model describes the rate of enzymatic reactions by relating reaction rate to the concentration of substrate. The findings of this project will be presented at Edgewood Engaged.

Michaelis-Menten equation: $v = V_{max}[S]/K_m + [S]$

ROSE, Parental Involvement, and College Attainment

Maggie Williams (*Honors Scholarship Project*)

Mentor: Amy Schiebel

The objective of this research project is to examine parental expectations pertaining to their child's choices post-high school and how those expectations are transmitted to their children and received by their children. As the demographic of college aged students is evolving and becoming more diverse, this topic is of significant interest to institutions such as Edgewood College. Furthermore, the goals of one of Edgewood's premier outreach programs, Resources and Opportunities in Science Education (ROSE), is to expand the range of opportunities available to students, particularly students of color. Research indicates that parents' educational expectations predicts college attendance and is the most influential for first-generation college students (Bui & Rush, 2016). Among all dimensions of parental involvement in their children's lives, educational expectations have the most profound effect on their children's academic achievements (Bui & Rush, 2016). Students from ethnic minorities are of particular interest since many of them fall into the category of a first-generation college student. Two groups will be compared with each group representing a subset of a different ethnicity. We will be focusing on expectations related to educational and career choices. Data will be collected through a survey from each study group. Participants will be drawn from communities with a history of engagement through the Office of Science Outreach. This data will be analyzed using an emergent coding method.

Reading Faces Better: Using Short Term Training to Evaluate Trait Empathy and Micro-expression Trainability

Michael Pflanzner (*Honors Scholarship Project*), Bailey Eschmann

Mentor: Ferrinne Spector

Micro-expressions (MEs) are involuntary facial expressions that occur within a very short timeframe (~1/25th of a second) and reliably indicate suppressed or subconscious emotions (Ekman, 2017). These facial expressions are universal, and can be measured from a set of facial muscles around the eyes and mouth (Ekman, 1972). Due to their fleeting nature, it is often difficult to identify when an ME has occurred and what emotion is expressed. Since MEs occur automatically, understanding the MEs of others can provide insight into emotionality and intentionality in the absence of other information. Research suggests that those with greater trait-empathy are better at recognizing micro-expressions (Svetieva & Frank, 2015). In addition, people can be trained to recognize and identify MEs (Matsumoto & Hwang, 2011; Ekman, 1972) using long-term training methods (e.g., over hours, days or weeks). The purpose of the present research is a) to replicate findings associating trait empathy with micro-expression identification, b) test the effectiveness of a novel short-term ME training protocol in improving ME identification and c) to understand how trait empathy is related to ME mirroring (i.e., using ME muscles when viewing MEs) and ME trainability. Participants will complete a trait empathy scale and be fitted with facial sensors using a Facial EMG. Participants will complete a pre-test measuring ME identification, followed by a 20-minute micro-expression training program, and an ME post-test. We predict that those with greater trait-empathy will show more facial mirroring and have better identification of MEs prior to training, but will demonstrate an increase in facial mirroring and greater improvement after training as compared to those with lower trait empathy. This study contributes to the understanding of how trait empathy utilizes networks sensitive to affect and intentionality in human faces, which may influence natural and developed skill in the interpretation of facial expressions.

Android Based Application for Recognizing Paintings

Pengyu Chen

Mentor: Atreyee Sinha

Project funded by an Ebben Fund Grant for Undergraduate Student Research

Painting recognition is an important and emerging research area in computer vision. Many potential applications are present in museums, industries, painting theft investigation, forgery detection, art education, etc. With the increasing availability of affordable smartphones and mobile data recently, android mobile applications have gained immense popularity. This project's goal is to design an Android-based mobile application that will enable users to take and upload information about the painting if it is found on the server. Painting Recognizer is the name of the mobile application. Painting Recognizer is built using Adobe PhoneGap and PhoneGap Build (mobile application platforms). The current version of this application can recognize up to 4,266 fine art paintings from 91 artists and the image dataset is called Painting-91. Programming languages such as HTML, CSS, Bootstrap, JQuery, and etc. are used to create this application. The current stage of the application has the front end completed. The application has the function hardcoded and the image recognition function is still a work in progress. Image recognition is easy for human beings to find matching images but hard to teach the computer to read the picture and find matches. Moving forward, Images will be translated into vectors, which are the massive amount of numbers together that the computer can read and recognize it as images. Furthermore, more features could be add into the Painting Recognizer such as directing the user to a different source when there is no match of the painting that is uploaded.

Student Satisfaction with the General Education Curriculum at Edgewood College

Bailey Eschmann

Mentor: David Lambert

General education has become a hallmark of higher education, nationwide. At Edgewood College, an accredited liberal arts institution, the general education curriculum is implemented through what is known as the "Tag System." The purpose of this study is to explore Edgewood College student attitudes and opinions about their general education curriculum, in order to gather a better understanding of how the Tag System affects Edgewood students and to identify any areas of potential improvement, so that future Edgewood College students may gain the full benefit of their general education curriculum and become well-rounded members of society. The findings of this project will be presented at Edgewood Engaged.

Vulnerability and Sociological Imagination through Digital Storytelling

Annie Bedore

Mentor: Julie Whitaker

Why does vulnerability so often have a negative connotation? Why are personal struggles seen as separate from public issues?

This project explores these inquiries through a blog format. The blog, "Stories in Context," accepts a wide range of stories from contributors online and frames their narratives through a larger social lens. The blog features stories that illustrate a wide range of issues, including a dreamer's immigration story over the US-Mexico border, one contributor's pointed critique and experience as an "other" in a public school lunch room as it relates the industrialization of the American food system, and one woman's journey with PTSD following her sexual assault.

Historically, vulnerability has been seen as a weakness. However, our culture's outlook has evolved over time, particularly with the digital age and the influence of social media, which has opened up a platform for self-disclosure. This blog format is meant to foster empathy through contributions of personal stories, particularly vulnerable ones. Through this project, we seek to promote vulnerable personal storytelling while also observing the larger social context of individual stories.

Applying a sociological imagination, (C. Wright Mills 1959) we integrate contributors' stories of personal troubles with larger social context in order to conceptualize them as public issues. Brene Brown's research surrounding the power of vulnerability also played an integral role in the project's inception. Applying greater social context to an individual's story allows us to observe our interconnectedness as a culture, and to recognize a full range of social issues that we face.

The Relationship between the Quality of Academic Advising and the Perception of Academic Outcomes of Saudi College Students

Maryam Awadh

Mentor: Ting Lan Ma

The one aim of all educational institutions is to advance the relationship between the academic advising and students' outcomes. The purpose of this study was to examine whether the level of quality of academic advising as measured by the advisor's meeting frequently, informativeness and availability, educational support, and career support predict students' persistence outcomes as measured by college loyalty, intent to drop out, social integration, and academic integration. This study helps providing evidence and empirical data to the field of academic advising quality by investigating its relationship with students' college commitment. The study is guided by Tinto integration theory (1987) and Astin involvement theory (1984) and used a quantitative method. The data was collected by distributing an online survey contained four sections: Students' demographic information, students' persistence, college commitment (including the social and academic integration), and the quality of academic advising. The sample comprised 89 undergraduate male and female freshman and sophomore students from a large university in Saudi Arabia. Pearson correlations and a regression model were conducted to statistically analyze the relationship between the quality of academic advising and students' persistence and their social and academic integration. The results showed that academic advising (e.g., the educational support and career support) positively predicted students' perceived academic integration. Another positive correlation was found between the students' persistence (e.g., the college loyalty) and the academic integration of students. These findings suggest that quality academic advising matters for students' college commitment. Future research should continue exploring the relationships between academic advising quality and students' college commitment without being limited to public institutions or homogeneous participants.

Attitudes toward Campus Climate and Safe Spaces at Edgewood College

Bret Stalcup, Breanna French, Shaquella Johnson

Mentor: David Lambert

The topic of safe spaces has had more recent media coverage in the past few years. However, there has been limited research specifically on the attitudes toward safe spaces. In a world where students of racial, ethnic, sexual, and other cultural minority groups have been the target of microaggressions, prejudice, and discrimination on college campuses, safe spaces provide a learning environment where students can talk about these encounters and other controversial issues in an honest, sensitive, and respectable manner (Arao & Clemens, 2013). Research was conducted by surveying Edgewood College students. Multiple topics will be assessed, including: Perceptions of safe spaces; Perceptions regarding campus climate; Experiences of subtle, everyday aggression (e.g. being told you should act more like your social identity) will be assessed using a modified LGBTQ Microaggressions on Campus Scale (Woodford et al., 2015); Racial salience, or how often one thinks about their race, will be measured using a single-item measure modified from Hurtado et al. (2015); Student's willingness to participate in social contacts of varying degrees of closeness with members of diverse racial groups will be assessed using a modified version of the Bogardus Social Distance Scale. Preliminary analysis suggests that while had predominantly positive attitudes towards safe spaces overall, students of traditionally marginalized identities have a more negative view of campus climate here at Edgewood.

The Effects of PTSD in Veterans on Partners and Family

Marissa Monson (*Honors Scholarship Project*)

Mentor: David Lambert

Much of the research on posttraumatic stress disorder (PTSD) focuses on the veteran and their PTSD symptoms. However, psychological research shows that PTSD is strongly associated with relationship-functioning amongst veterans and their partners. Yet, most programs and resources for managing PTSD are for the veterans only, and not their partners or other family members. A need exists for many loved ones to help their veteran partners cope with their PTSD, as well as for the partner or family member themselves to cope with veteran's PTSD symptom severity. Based on psychological data, this creative inquiry will emphasize needs reported by a social worker who works with veterans with PTSD and their families, resulting in the creation of a deliverable resource for partners or other family members of veterans to use for their benefit. This artifact will result in a greater understanding of how PTSD is associated with relationship functioning among veterans, and will be made for the general population whom do not know how to read and interpret psychological research on this topic.

Effects of BPA in the Expression of Tyrosine Hydroxylase in Exposed Zebrafish

Amitoj Mavi (*Honors Scholarship Project*), Jayci Miles

Mentor: Brenda Del Moral, Peter Kuhn

Project funded by an Ebben Fund Grant for Undergraduate Student Research

Bisphenol A (BPA) is a synthetic chemical that is employed to make plastics and epoxy resins that are present in many commercial items. Past research has shown that the pollution of these omnipresent plastics in the water can have a detrimental affect on aquatic wildlife. One possible impact is the depletion of dopamine, a neurotransmitter (NT) highly involved in reward-motivated behavior. A depletion in this NT can cause anxiety and depression related behaviors. Dopamine is synthesized by the rate limiting enzyme called tyrosine hydroxylase (TH). With this in mind, we asked whether or not BPA would have an effect on the levels of TH present in zebrafish. In this experiment, zebrafish embryos were used as model organisms due to their similar genetic structure to humans. Twice a week, the two experimental groups were dosed with either 1 mM or 5 mM of BPA. After dosing, to quantify the levels of TH present, the zebrafish RNA was purified and extracted. Following this, quantitative polymerase chain reaction (qPCR) was conducted and data were analyzed. It was hypothesized that the embryos exposed to BPA would express less tyrosine hydroxylase. Once data analysis was completed, it was found that there was a decrease in the levels of TH expressed in the zebrafish due to BPA, supporting our hypothesis.

The Effects of Substrates and Body of Water on the Functional and Family Diversity of Macroinvertebrates in the St. Croix State Park

Joshua DeGuire, Sarah Wells

Mentors: Mekel Wiederholt Meier, Jerry Kelly, Catherine DeGuire

The objective of this experiment was to compare the relative effects of the substrate versus body of water on the family and functional diversity of macroinvertebrates present. We hypothesized that the body of water would have more effect on the macroinvertebrates present than the substrate because the uniform water quality of each body of water would have a great effect on the macroinvertebrates' ability to survive in the water. Macroinvertebrates are greatly affected by water quality which causes many macroinvertebrates to be unable to live in certain bodies of water, affecting the diversity of macroinvertebrates. To determine whether the substrate or body of water had more effect on the diversity of macroinvertebrates, we collected macroinvertebrates in four different bodies of water in four different substrates along each body of water. The hypothesis was mostly supported with some exceptions, suggesting that the body of water has a greater effect on the diversity of macroinvertebrates than the substrate in which they live.

The Evolution of Legislation Surrounding Effigy Mounds

Kendra Benedict

Mentor: Shad Wenzlaff

Effigy mounds have been an important and culturally significant piece of land art for centuries in Wisconsin and the greater Midwest. Since their construction, understanding and perceptions have shifted numerous times. During the urbanization of Madison, particularly, numerous effigy mounds were flattened to make way for the city's expansion. Today, however, there are numerous effigy protection plans in place and citizens have adopted the effigies to be a symbol of their own culture. From the beginning of urbanization opinions have changed from complete disregard of the effigy mounds to a deeper respect and cherish. Relating to the evolution of popular opinion, legislation has evolved as well. The purpose of this research is to understand how legislation has evolved through history in relation to the popular opinions regarding effigy mounds and their preservation and/or destruction. Legislative documents were gathered using the wisc.gov website along with news reports on changing legislation. Public opinions were researched using online databases containing historic newspapers documenting the public's voice and events surrounding the Midwest effigy mounds. The research will demonstrate a time-line on the evolution regarding effigy mound legislation and popular opinion.

Accessible Spaces in Madison: Redefining Accessibility

Nikki Satterlund

Mentor: Shad Wenzlaff

Project funded by an Ebben Fund Grant for Undergraduate Student Research

One of the major issues in disability rights activism is the issue of accessibility. What spaces can those with disabilities access, what spaces are they barred from, and why? What is it that makes a space accessible? This research project explores these questions by assessing the accessibility of key landmarks in the city of Madison, including the state Capitol building, the Monona Terrace, the Memorial Union, and State Street. Evidence was gathered through observation, field notes, and photographs. Additionally, interviews were conducted with a young autistic woman, her mother, and a woman with a neural muscular disorder, in order to obtain perspectives and experiences from individuals within the disability community. The project took a critical look at accessibility guidelines set forth by the Americans with Disabilities Act (ADA), to evaluate where spaces met these guidelines, and to look at ways in which simply meeting these guidelines might still fall short of creating accessibility and inclusion. Accessibility was viewed through the lens of multiple disabilities, and considered a key feature to the design of spaces. It was found that those with disabilities are often not considered in spaces and are excluded in a variety of ways, and that there existed within spaces a narrow definition of accessibility. By contending with spaces through this lens, the project critically analyzed factors that created accessibility and inaccessibility, and redefined what it means to make a space accessible.

Evaluation of Interdisciplinary Rounds in the Medical Intensive Care Unit

Kathryn Miller

Mentor: Lori Severson

In intensive care units, the complex needs of critically ill patients require a team-based approach. The growing emphasis on comprehensive care delivery requires shared decision-making through communication and collaboration. Interdisciplinary rounds provide a formal process for clinical disciplines to collaborate in planning patient care. Nurses spend the most time providing direct patient care, thus a key team member of interdisciplinary rounds to communicate and collaborate in the development of appropriate patient care plans. Literature shows high levels of collaboration correlate with nurse satisfaction and retention as well as improved patient outcomes. It is important to understand nurses' perceptions of collaboration, communication, and satisfaction regarding interdisciplinary rounds. The purpose of this evaluation was to assess: (1) nurses' perceptions of the purpose of interdisciplinary rounds and whether these perceptions were consistent with practice, (2) whether specified components of rounds were perceived as barriers to or essential to overall patient care, (3) nurses' perceived level of collaborating in and contributing content to interdisciplinary rounds, and (4) nurses' level of satisfaction with the current process of rounds. A paper survey consisting of open and close-ended items was developed to generate data to address the evaluation questions. Sixteen nurses were invited by email to participate, and seven (44%) returned a survey. Data will be analyzed to describe frequencies and to examine associations among variables, for example the association between level of perceived collaboration and nurse satisfaction. Open-ended data will be coded to identify pertinent themes. Data analysis and the development of conclusions and recommendations will be completed by mid-April.

Simulation in a Local Nurse Assistant Training Program

Kristin Hildebrandt

Mentor: Lori Severson

The Center for Healthcare Education and Simulation (CHES), located in Madison, Wisconsin, provides a Nurse Assistant Training Program several times per year. While current pass rates are high overall, there is an identified deficit in the pass rate of CHES graduates for several physical skills competency sections in the State of Wisconsin Nurse Assistant Certification Exam. To address this, curriculum changes were made to the program to add patient care simulations, which provided extra structured practice time for skills, communication and teamwork. A program evaluation was completed with the first student cohort to complete the program with the curriculum changes. The main purposes of this program evaluation were (a) to determine if curriculum changes and the addition of patient care simulations would increase students' confidence in performing the skills, roles and responsibilities of a Nurse Assistant and (b) increase feelings of preparedness and confidence in taking the State of Wisconsin Nurse Assistant Certification Exam. In addition, pass rates would be evaluated for this cohort to determine if there was a corresponding increase in the number of students who passed the physical skills competencies in the state exam.

All students were surveyed on the last day of the Training Program. 13/15 students reported patient care simulations were extremely helpful for learning the skills, roles and responsibilities of a Nurse Assistant. 15/15 reported feeling very or extremely prepared for the State Certification Exam, with 10/15 feeling very or extremely confident they would pass it. 5/15 students commented specifically about patient care simulations being helpful for learning skills. Exam pass rates are not yet available. Further analysis will assess associations among the evaluation variables. Data analysis and the development of conclusions and recommendations will be completed by early April.

CELEBRATION RECEPTION

5:30-6:15 PM, STREAM ATRIUM

By invitation, RSVP required

KEYNOTE LECTURE/RECITAL

6:15-7:30 PM, ANDERSON AUDITORIUM

Open to the public

Debussy and his Friends:

An Evening of French Music, Poetry, Art, and Politics

Guest Speaker: Dr. Catherine Kautsky, Chair of keyboard at Lawrence University. Her book, *Debussy's Paris: Piano Portraits of the Belle Epoque* was published in 2017.

INVESTIGATIONS IN BIOLOGY

9:00 AM - 9:50 AM, SONDEREGGER ATRIUM

Mentor: Zach Pratt

Does an Increase in Cardiac Protein, Xirp2, Initiate Early Maturation of Cells in a Model of Hypertrophic Cardiomyopathy?

Annie Armstrong

Project funded by an Ebben Fund Grant for Undergraduate Student Research

Cardiovascular disease is the leading cause of death in the United States with over 600,000 deaths per year. In light of this, it is important to study the causes and development of various cardiovascular diseases in order to better understand and treat these conditions. Hypertrophic cardiomyopathy (HCM) is the most prevalent genetic heart disease, affecting as many as 1 in 200 people worldwide. This condition is characterized by an enlarged heart that lacks the ability to fully relax, and is caused by genetic mutations in proteins responsible for contraction of the heart. The most commonly mutated protein leading to HCM is called cardiac myosin binding protein-C (cMyBP-C).

In order to study this cardiovascular disease, we utilized a mouse model lacking cMyBP-C (cMyBP-C^{-/-}) that replicates HCM symptoms. Previous studies of cMyBP-C^{-/-} hearts revealed a strong increase in abundance of a protein called Xirp2 relative to healthy hearts. Xirp2 is essential for the maturation of specialized structures between heart cells after birth. These structures, called intercalated discs, do not normally mature until a month after birth in mice. We used a technique called immunofluorescence to identify the location of this protein in HCM and healthy hearts. Interestingly, our data suggests early maturation of intercalated discs in cMyBP-C^{-/-} hearts that we believe is due to the increase in Xirp2 protein abundance.

These data suggest a possible role for Xirp2 early in the development of hypertrophy in our mouse model of HCM and identifies a potential target for future therapeutic treatments.

Identification and Characterization of a Bacteriophage that Infects *P. fluorescens*

Morgan Vaccaro, Sabrina Fleege

Bacteriophages are viruses that infect bacteria. They have specific tropism, meaning that they only infect a narrow range of bacterial hosts which can support their life cycle. These viruses store information in genomes that can be either DNA or RNA. This genome contains the minimal amount of information needed to sustain itself within the infected host. Once they are able to mature into infectious bacteriophages, they exit the host cell and are able to infect other cells. In order to further understand what genes are needed for a bacteriophage, we will annotate the genome of the isolated *Pseudomonas fluorescens* bacteriophage.

A sample of sewage water, containing *Pseudomonas fluorescens*, was collected and filtered in order to isolate bacteriophages. The filtered sample was introduced to *P. fluorescens* on an agar plate and then incubated overnight. A single plaque was removed from the plate and introduced to phage buffer in order to perform serial dilutions. The dilutions were then placed on a plate of *P. fluorescens*, followed by incubation overnight. Following incubation, a single plaque was chosen from the plated dilutions and reintroduced to a phage buffer. This solution was then inoculated into a culture of *P. fluorescens* and placed in a water bath. The genome of the phage will then be isolated, allowing for it to be annotated.

From the annotation of the genome, we would expect to see genes needed for the viral life cycle. Since not all bacteriophages require the same genes to support their life cycle, we can better understand the genes selected for by individual phages through this annotation. Individual genes could encode for receptor binding, capsid, or other proteins. We will also look into the promoter regions for the bacteriophage genes in order to determine when the genes are expressed throughout the lifecycle. We might also expect to see single genes that allow for multiple functions in order to increase the economy of the genome. Stemming from this annotation, a future direction could be to look more in depth into genes that are located within the nucleic acid sequence and what their roles are in sustaining the bacteriophage life cycle.

Isolation and Annotation of *P. fluorescens* Bacteriophage Genome

Amelia Frenson, Jonah Weld

Project funded by an Ebben Fund Grant for Undergraduate Student Research

Bacteriophages (phages) are viruses that infect bacterial cells and replicate within the cells to produce more phage and infect nearby cells. Phage are composed of a capsule with genetic material housed inside, which is then inserted into bacterial cells and replicated within the cytoplasm, then releasing new phage into the environment through lysis of the cell. Antibiotic agents are a well-known substance used for the control of bacterial growth, however overuse is leading to bacterial resistance and decreased effectiveness of antibiotics. Phage are a natural alternative to controlling bacterial growth, resistance is much less common, and they are non-toxic to eukaryotic cells. This set of factors gives rise to the possibility of treating food products with phage to prevent spoilage. The bacterial species *Pseudomonas fluorescens* plays a major role in food spoilage and the development of a biofilm layer across the top of the material it is adhered to. Biofilm is an aggregation of cells that undergo a phenotypic change and produce an extracellular polymeric substance (EPS) around the cell. The thin layer of EPS_A is composed of polysaccharides that support bacterial cell growth by surrounding and enclosing the cells to protect them from environmental stressors and aid in adherence to surrounding surfaces. Some phage have shown to contain an EPS depolymerase gene, which encodes for an enzyme that degrades the structure of biofilms. We will be sequencing the genomes of isolated bacteriophages that are capable of infecting *Pseudomonas fluorescens*, and annotating their genomes to identify any genes that are homologous to any known EPS depolymerase gene. We will also test the phages' effectiveness of inhibiting *Pseudomonas fluorescens* growth to determine the phages' efficacy of controlling bacterial growth.

Genomic Annotation of Bacteriophages that Infect *P. fluorescens*

Angela Dailey, Taylor Funk, Shanaya Hebgen

Bacteriophages are viruses that are capable of infecting bacterial cells. They infect bacterial cells by attaching and injecting its genome into the host. Once inside the host, it overrides the cell machinery to create new viral particles that will lyse the cell. Even though there is a lot known about bacteriophage infectivity, there are still more questions to be answered. In order to learn more about bacteriophage characteristics, an experiment was set up to isolate a virus that infects *Pseudomonas fluorescens*. The bacteriophage sample was obtained from a sewage treatment plant. The sewage water sample was filtered, plated and incubated with *P. fluorescens*.

to allow the virus to inject its genomic material into the host. A single phage from the plaque was isolated and allowed to grow on a nutrient rich media. The phage genome will be annotated and analyzed in order to categorize it into one of the three bacteriophage families; Myoviridae, Podoviridae, or Siphoviridae. The categorical prediction will be based on the similarities of the structural proteins found within the phage genome.

Identification and Genotypic Annotation of Isolated *P. fluorescens* Infecting Phage and the Control of Growth and Biofilm

Andrew Wells, Bri Roska

Escherichia coli is a well-known coliform bacterium that has the ability to cause disease in humans. As such, it's important to find ways to prevent the growth of *E. coli*. One way we might be able to combat *E. coli* and other pathogenic bacteria is through the use of bacteriophages. Bacteriophages are viruses that only infect and kill bacterial cells. Viruses infect cells by binding to a specific protein receptor or receptors on the surface of their host cell. Identifying the receptors phage use to infect a cell is important so that we can design cocktails of unique bacteriophages that all target different receptors. Doing so may minimize the chance the bacteria in question can evolve and become resistant to the bacteriophage treatment. I tested which receptors 3 unique bacteriophages used to infect *E. coli* strain K-12. In order to accomplish this, a library of K-12 clones, each lacking a single surface receptor, was used. Each of the phages were tested for their ability to infect each mutant clone to identify their receptors. Clones that were infected less well than the wild-type strain had a missing receptor that was required for the bacteriophage's life cycle. It was found that 2 of the 3 bacteriophages tested required the protein FhuA for their lifecycle and the third had reduced infectivity on several different strains, indicating that it uses several receptors to attach to *E. coli*. This information might be useful in the future for reference when making a cocktail of bacteriophage.

Identification and Characterization of a Bacteriophage that Infects *Pseudomonas fluorescens*

Annie Armstrong, Mikayla Donlon

Pseudomonas fluorescens, while not a pathogen, has implications to humans both in agriculture and dairy industries. *P. fluorescens* is often found in areas with soil, plants, and water and has been shown to produce an antibiotic, Mupirocin, that protects soil against pathogens and has been used to treat skin, ear, and eye disorders in humans. However, *P. fluorescens* is a bacterium capable of spoiling dairy products, including milk because of its ability to survive the cooler temperatures of the refrigerator. This bacteria degrades proteins, producing some of the off-flavors associated with sour milk.

Bacteriophages are viruses that infect bacteria and are found wherever bacteria exist. Often, bacteriophages are used to kill certain unwanted bacteria in wastewater treatment facilities, dairy products, and more. There has recently been a push to inhibit *P. fluorescens* in milk using bacteriophages to extend the shelf life.

We have isolated a bacteriophage from *P. fluorescens*, extracted the DNA, and sequenced its genome. We aim to annotate the genome to determine identity of the phage and the genes present. In addition, we plan to compare the protein degradation of milk in the presence and absence of bacteriophage infecting *P. fluorescens* to determine if phage infection would be a possible treatment to prevent milk spoilage due to *P. fluorescens*.

Isolation of *Pseudomonas fluorescens* and Codon Biases

Grace Kosmatka, Tori Wiskow

Pseudomonas fluorescens is a gram-negative bacterium that can compete with other microorganisms for nutrients and can be used to prevent agriculture disease. This bacterium is generally found in plants, soils, and water. *Pseudomonas fluorescens* contains roughly 6 million base pairs and 5630 proteins according to NCBI. Now, this brings up the question: does the phage that infects *Pseudomonas fluorescens* contain a bias towards a specific codon.

We first had to gather a sample containing the bacteriophage that infects *Pseudomonas fluorescens* from Madison Metropolitan Sewage District. We then filtered our sample so that the bacteriophage was isolated. With the isolated bacteriophage, we mixed it with bacterial host and plated it onto an agar plate allowing us to isolate a single plaque. We then isolated a single bacteriophage through two passages of isolation. From there the phage genome was isolated, sequenced, using PacBio SMRT, and then annotated.

We plan to look at the specific codons that encode for the proteins that make up the phage that infects *Pseudomonas fluorescens*. We plan to investigate if the phage has different codon usage than their host. Are there certain codons that dominate the genome? If there is a bias, it could indicate that the bacteriophage must encode for their own tRNAs that recognize and bring in amino acids to these codons. This bringing in of their own tRNAs could be an adaptive mechanism that allows the bacteriophage that infects *Pseudomonas fluorescens* to thrive in different environments.

INVESTIGATIONS IN MUSIC

10:00 AM - 10:45 AM, ST. JOSEPH'S CHAPEL

The Forgotten Works of Fanny Mendelssohn Hensel and Clara Schumann: A Lecture Recital

Collin Haas

Mentor: Julie Dunbar

My research examines the work of Fanny Mendelssohn Hensel and Clara Schumann as composers and performers of art music in nineteenth century Germany, and demonstrates that during their lifetimes, these women were known for their accomplishments. Many twentieth century musicologists, however, focused their narratives almost solely on men, ignoring earlier accounts of these once-famous women. Therefore, the works of Fanny Mendelssohn Hensel and Clara Schumann became lost, and are rarely performed. By using primary source documentation such as diaries and letters, as well as early news accounts from the nineteenth century, I will demonstrate that the work of these women was known in their lifetimes, and was highly regarded. The performance aspect of the lecture recital places the work of these women alongside that of the better known men in their lives, Felix Mendelssohn and Robert Schumann. By performing and discussing the works of all four composers side by side, the listener will see and hear evidence that the women's work is equally deserving of being honored. A major focus of the project is to show that narratives on paper have had a lasting impact on what is actually performed and studied in the art music world, even to the present.

INVESTIGATIONS IN DISMANTLING RACISM

12:00 PM - 1:00 PM, THE NONA MCGREAL ROOM

Mentor: John Leonard

Dismantling Racism within Edgewood Athletics

Amir Franklin, Ryan Fields

Building on our year-long Seminar's study of Racism and Black/Womanist Theology, my semester project focuses on challenging and dismantling racist biases on Edgewood's campus, specially through the athletic department.

Through additional academic research and community partnerships I am investigating what is being done to dismantle racism in Edgewood's athletic department and how my own learning, beliefs and action can contribute to Edgewood's core values of building a more just and compassionate world.

My research bibliography includes Joseph Barndt, "Understanding and Dismantling Racism: The Twentieth-First Century Challenge to White America," Stephanie Mitchen's, "Introducing Womanist Theology", and an anthology of research regarding race and sports provided via the NCAA.

My community partners in this investigation include the athletic department on campus.

Cultural Humility in Nursing

Kelsey Shaw

Purpose

I have decided to do a presentation to address the need for cultural humility in the healthcare field. Pew research conducted a study that stated 58% of Americans in 2017 believe that racism is a "big problem". With this being the case, it can be deduced that disparities in healthcare affect people of color. Not only that, but according to the CDC, black woman are 243% more likely to die from childbirth related causes than white woman (Martin 2017). Educating healthcare professionals on multicultural approaches is one way in which this disparity can be alleviated in the future.

Method

This poster will specifically be providing information on the many different cultures of India, focusing on the practices revolving around perinatal care. The 40 day confinement period common to most communities in India will be discussed along with other cultural practices from labor and postpartum care.

The second and final group of individuals included are African American patients. African Americans tend to be the more marginalized group among other nationalities and the most common, next to Caucasians, in American healthcare.

The research that has been collected are a series of journal articles and studies revolving around cultural practices in perinatal care. Statistics will be collected from the CDC on birth rates and the US census for population information. These sources consist of periodicals of qualitative accounts outlining cultural sensitivity practices in a patients hospital stay and can be found below.

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Oppression through Food Availability and Nutrition

Olivia De Castro

Over the course of this year, I have been learning about how Black theology and Womanist theology can act as frameworks to dismantle racism. Through this lens, I specifically seek to combat racism in the Madison area by increasing food and nutrition availability for everyone. I will achieve this by working with community partners, specifically Kristel Renn, a graduate student at Edgewood, and the Boys and Girls Club. My specific contribution will include helping the children grow seedlings and plant them in a community garden. I hope that with my help, the kids can develop skills that can be employed for a lifetime. Some texts that will guide me through this project include works such as "The Unbearable Whiteness of Milk: Food Oppression through the USDA," by Andrea Freeman and Dismantling Racism by Joseph Barndt, among others. I will present my research and experiences through a PowerPoint presentation with accompanying notes and bibliography.

Black Beauty

Brooklyn Doby

In our class on Black Theology and Dismantling Racism we have been learning how Womanist Theologians address the racism, sexism and classism experienced by black women throughout American history. Oppressed and used as objects of property, production, and reproduction by racism, they were stereotyped as lascivious whores by a patriarchal sexism that required they be submissive to men, emulate the image of "Victorian lady," carry the responsibilities of childcare, eldercare, their own households and a full-time job to prove their worth. In *Introducing Womanist Theology*, Stephanie Mitchem noted, "black women's conceptions of self as women reflect their mothers' lives, continue to be shaped, and are handed to their daughters"(p.6)

The intersection of oppressions listed above, together with the grouping of African American women into one category or saying that "all black women are like..." has negatively impacted their relationships with themselves, their bodies, and the rest of the world and makes it difficult for them to love themselves, for their voices to be heard, and to feel as though they belong in the black community, or any community.

This sparked my interest in exploring how my work as an artist and art therapist might contribute to the dismantling of racism and healing some of the wounds inflicted by the mistreatment of African American women throughout time. Art therapy is a form of creative expression that allows people to tell their stories without the fear of being judged. My goal with this project is to uplift African American women, by helping them find the beauty in themselves, and by giving them an opportunity to tend to self care, without the feeling of guilt.

For this project, I have invited African American women faculty, staff, and students at Edgewood College to attend a paint night which I will be facilitating. We will be painting a silhouette of an African American woman, incorporating a collage of words that we associate with being a strong, black woman. The objective is to provide

a safe space where they feel they belong, encourage a bond, and to remind them that are women who can be proud of being themselves. Creating a painting gives participants something to take home and hang up for inspiration.

Prior to this session, I will be distributing a survey to the participants to gather information on their experiences of being oppressed, feeling less than men and/or white women, and what it means to be "good enough." Throughout the paint night, there will be open dialogue about these topics, as well as, I will be sharing with them some of the research I have done. This topic is important to me, as someone who struggles with finding my place within my own identity and community.

For Edgewood Engaged, I will be sharing photos of the art we create with reflections gleaned from my study of Womanist Theology, my participation in the White Privilege Conference, and my study of Art Therapy.

Business Racial Ethics

Michael Wiebe

How much does the average Business major learn about institutional racism in America and the racially-discriminatory business practices, like "redlining," that contributed significantly to the racial disparities that still exist 50 years after the Civil Rights Movement? Redlining, real estate and insurance practice that was birthed in the 1930's, purposely separated races geographically, economically, and socially. Redlining deepened the racial divide by unnaturally segregating our communities and schools, undercutting asset development amongst minorities, negating the development of gainful employment in minority communities, and much more. Though redlining has been illegal since the Civil Rights Act in 1968, many financial institutions and insurance agencies have not abandoned the practice (Szto, 2013). The lessons that this example offers can become great tools that future business leaders can use to support their efforts to create just and equitable businesses that support the common good.

With this in mind, I am creating an interactive lesson plan and activity that will explain redlining and enable students to experience the injustice of the practice by playing a game of "Redlining Monopoly." Adapted from the famous board game, this version of the game includes rules, short readings, and lessons drawn from the practice of redlining. This particular lesson/activity may be used in a number of Business courses such as BUS 348 *Social Entrepreneurship*, BUS 304 *Business Law*, and/or BUS 616 *Business Ethics*.

INVESTIGATIONS IN SOCIAL JUSTICE

1:05 PM - 1:55 PM, THE NONA MCGREAL ROOM

Forward-Looking Collective Responsibility in Relation to Reparations in American Culture

Siriano Lambert

Mentor: Geoff Adelsberg

Project funded by Multicultural Learning Fellowship

The purpose of my presentation is to convince my audience that black reparations are necessary for our country to thrive, both for moral and practical reasons. The goal of my research is to find and synthesize convincing arguments in favor of black reparations in American society. This will involve establishing the fact that the effects of slavery are still having repercussions today; in short, I will attempt to demonstrate that the caste system of yesteryear has not be demolished, but only changed form, with race still at the heart of it. I will attempt to persuade my audience that it is morally imperative that we seek to right this wrong, beginning by reversing governmental policies that disproportionately wrong people of color. I will also attempt to demonstrate, if possible, that it is in the majority population's favor to see these reparations made.

DACA Leaders: Developing Student Leadership within the Latinx Community

Mathias Lemos Castillo

Mentor: Gerardo Mancilla

Project funded by an Ebben Fund Grant for Undergraduate Student Research

The Deferred Action for Childhood Arrivals (DACA) program was established by the Obama administration in 2012 to support undocumented youth. The program provided youth deferment from deportation along with a work permit for a two-year period. DACA has provided youth leadership opportunities that are not available for undocumented students due to their legal status. This research explores how having DACA has impacted youth's development within their leadership opportunities. Two questions guiding this research are: (1) How do DACA participants develop leadership skills? (2) How are DACA participant's active leaders within their communities? This research uses published stories of DACA recipients to analyze the impact of having DACA. These stories have been published in articles, magazines, and online sources. Five stories will be analyzed to find common themes and highlight the impact of DACA on these individuals as it relates to leadership development. The results will provide critical information for educators and community members to develop student leadership within the Latinx community.

Sheltering Women in Developing Countries

Hewan Schade

Mentor: Stephan Gilchrist

"According to the most recent estimates, in 2013, 10.7 percent of the world's population lived on less than \$1.90 US dollars a day; which is down from 35 percent in 1990," according to The World Bank. In most developing countries women do not have rights, nor are they provided with the proper education and job opportunities. The goal of this project is to create communities of women that can take care of each other and themselves, while focusing on sheltering homeless women with children. We will interview homeless women and government officials to help us figure out the issues surrounding poverty, so we can come up with solutions. Currently, I am figuring out creative ways to house women. A potential way could be a transportable house to allow women to move their house to safe spaces as well as provide shelter. Another option would be teaching women to build homes or a space for community living for women.

I am a product of this environment. My mom was shunned from her family for having two girls with no husband. To find a better life she moved us to the city, but there were no resources for her to feed us, send us to school, or house us. She begged in the streets and lived day to day. We were homeless until my sister and I ran away to an orphanage. This summer I am going back to Addis Ababa, Ethiopia for a month to find my mom, research nonprofit organizations, make connections, and survey women to learn what they need so they can contribute to their family's growth and the economy.

INVESTIGATIONS IN COMMUNICATIONS

2:00 PM - 2:50 PM, PREDOLIN 307

Mentor: Bonnie Sierlecki

S*X ED: The Effects of Gender and Secondary Education on Sexual Education Competency

Sabrina Fuller

This research examines the effectiveness of sexual education communication on the comprehension of knowledge later in life. It looks at four subjects in the realm of sexual education: biology, consent, relationships, and sexually transmitted diseases. Based on Wisconsin's state statutes regarding public education, this state requires teaching an abstinence-only education, where refraining from sex before marriage is stressed, and parents can opt their child out of receiving it. This type of education also focuses on abstinence as the main method for birth control and HIV prevention, and is not inclusive to different genders and cultures (unlike comprehensive sexual education). Studies have suggested that abstinence-only education is not effective in providing effective knowledge to students, and that many students are unsatisfied with their education later in life. A sample of 226 students from a liberal arts college were tested measuring their comprehension of sexual biology, sexual consent, sexual relationships, and STDs. The study shows that there was no statistically significant difference in combined scores between genders or between the two types of sexual education (abstinence-only versus comprehensive). However, results indicated that abstinence-only recipients scored significantly higher in biology comprehension than recipients of comprehensive sexual education, and that as age increased, understanding of consent decreased for older age groups. There was also a correlation between confidence in participants' knowledge and their actual scores. This study shows that many misconceptions exist about sexual education in Wisconsin, and increasing education on sexual consent may contribute to increased comprehension later in life.

The Use of Choice when Advertising to Mothers at Meriter UnityPoint

Anna Toppel

The purpose of this qualitative research study is to analyze how well Meriter Unity Point promotes a mother's choice surrounding pregnancy care- before, during and after birth. Many women feel their birth preferences are not taken into consideration during their labor and delivery. I plan to analyze online advertising by Meriter UnityPoint birthing center and assess language used that promotes a mother's choice. The types of language that promote choice are providing multiple options and using terms such as you and yours as well as being available for questions or discussion. This research will help determine how well Meriter promotes patient-centered care, defined as the practice of caring for patients and their families in a way that is most meaningful and valuable to them.

Queer Presence in the Media: The Misrepresentation of Femme Lesbians

Sadie Cordova

As a child I kept realizing that there was no one like me in the media, there was no one who identified as feminine and also as a lesbian. This created a weird construct of love and identity in my mind and also stunted my growth in my self-identity. I still think about the way this affected me as an adult and wanted to look into it further. This research on the representation of femme lesbians was conducted in hopes of better understanding the way femme lesbians are represented, or underrepresented, and why this is happening. For this study, I watched six shows and four movies. Five of those having a femme-femme couple and 5 having femme-butch couples. I used a very strict process to choose these films/shows and an intricate grading system with specific criteria to assess the following questions:

1. What trends do we see in the representation of femme lesbian characters?
2. How do these characters representations compare to femme lesbian YouTubers who present themselves as realistic representations of lesbians?
3. Why might femme lesbians be portrayed the way they are?

I found that there is a lack of accurate representation in the media. I theorize that this is due to the fact that sexualizing lesbians follows American trends of sexualizing females and therefore makes their sexuality more acceptable. This study adds realms of representation and its effects on society to the field of communications. We see a discrepancy as there are more opportunities to be represented (with the increase in technology in day to day life), yet less representation that is accurate.

CONCURRENT FINE ARTS EVENTS

Stream Atrium

Edgewood College Gallery hosts the annual Student Juried Exhibition in which all undergraduate students are invited to present their scholarly and creative work. Both the Student Juried Exhibition and Edgewood Engaged provide students with the opportunity to share their scholarly and creative accomplishments with others to educate and inspire.

“Art of Art Therapy” Exhibition & Gallery Talk

Friday, April 27, 4:00 PM, Stream Second Floor Atrium Hallway

Mentor: Janice Havlena

An exhibition by art therapy students from their senior capstone art therapy internship sites. Art therapy students designed and facilitated the art processes for participants.

Concert Band and Jazz Ensemble

Sunday May 6, 2:30 PM, St. Joseph Chapel, Regina Hall

“As You Like It”

April 27, 28, May 3, 4, 5, Diane Ballweg Theatre, Stream, ticketed event.

A classic Shakespearean comedy featuring strong female leads, mistaken identities, and hilarious attempts at finding love in the forest of Arden.

Women’s Choir, Chamber Singers, Edgewood Chorale and Guitar Ensemble

Time to be announced, St. Joseph Chapel, Regina Hall

INVESTIGATIONS IN BIOLOGY

9:00 AM - 9:50 AM, SONDEREGGER 104

Successful Identification of *C. scandens* DNA Using Polymerase Chain Reaction and Gel Electrophoresis

Christopher Leo

Mentor: Pete Kuhn

Celastrus scandens is a species of sturdy perennial vine indigenous to the United States. *Celastrus orbiculatus* is a near identical invasive species of the same vine. Both *Celastrus* vines provide an important ecosystem service to their environment by providing food to local birds and mammals in the form of bright colored berries. *Celastrus orbiculatus*, often out competes *Celastrus scandens* and other indigenous plants. This study explored whether *Celastrus scandens* and *Celastrus orbiculatus* can be distinguished from one another by using polymerase chain reaction to amplify single strands of template DNA, which were extracted from the leaves of both species of *Celastrus*. Post DNA extraction, we applied the amplified strands of DNA to agarose gels and electrophoresed them, then stained the results with ethidium bromide. The stained agarose gels were compared against a provided key. The results were mixed, but provided enough information to determine the origin of many of the provided samples. The stained gels indicated that out of the two sets of primers, only *Celastrus scandens* selectively amplified the target species, while *Celastrus orbiculatus* amplified DNA from both species.

Identification of Host Receptors Bacteriophage P12, P15, and P29 Use to Infect *E. coli* Strain K-12

Andrew Wells (*Honors Scholarship Project*)

Mentor: Zach Pratt

Escherichia coli is a well-known coliform bacterium that has the ability to cause disease in humans. As such, it's important to find ways to prevent the growth of *E. coli*. One way we might be able to combat *E. coli* and other pathogenic bacteria is through the use of bacteriophages. Bacteriophages are viruses that only infect and kill bacterial cells. Viruses infect cells by binding to a specific protein receptor or receptors on the surface of their host cell. Identifying the receptors phage use to infect a cell is important so that we can design cocktails of unique bacteriophages that all target different receptors. Doing so may minimize the chance the bacteria in question can evolve and become resistant to the bacteriophage treatment. I tested which receptors 3 unique bacteriophages used to infect *E. coli* strain K-12. In order to accomplish this, a library of K-12 clones, each lacking a single surface receptor, was used. Each of the phages were tested for their ability to infect each mutant clone to identify their receptors. Clones that were infected less well than the wild-type strain had a missing receptor that was required for the bacteriophage's life cycle. It was found that 2 of the 3 bacteriophages tested required the protein FhuA for their lifecycle and the third had reduced infectivity on several different strains, indicating that it uses several receptors to attach to *E. coli*. This information might be useful in the future for reference when making a cocktail of bacteriophage.

9:00 AM - 9:50 AM, SONDEREGGER 108

Conditioned Placed Preference Measures the Effect of TrkB Antagonism on the Preference for Ethanol in Zebrafish

Anh Hoang

Mentor: Brenda del Moral

Addiction, specifically alcohol and drugs, is one of the most problematic issues in the United States. People and animals demonstrate a preference for drugs and alcohol through a learning procedure called classical conditioning. A particular conditioning test, called conditioned placed preference (CPP), allows for the subject to show an initial preference for a drug after only a few exposures. In the research that was conducted, initial preference was determined and CPP was used to reduce the learned preference for ethanol using a TrkB-antagonist called ANA-12. TrkB ANA-12 is an anti-depressant and has shown the reduction in cocaine addiction by preventing the activation of brain-derived neurotrophic factor (BDNF) based on a previous study. From this study, it was supported that the BDNF expression in the brain showed fluctuation. The BDNF is responsible for growth factors and the development of the cortex. Since it has shown positive evidence that TrkB ANA-12 worked on cocaine addiction, it was further used in this experiment as well, to help reduce alcohol preference. In the experiment, 36 zebrafish (*Danio rerio*) were trained with ethanol in a tank with two sides that were marked either dotted or plain white. We exposed them to ethanol on their non-preferred side. One group was treated with ANA-12 to measure if that changed their preference for ethanol. Based on the analyzed data, the results indicated that this training with ethanol did work in producing a change in preference; however, the drug TrkB ANA-12 had no significant effect on the ethanol-induced preference.

10:00 AM - 10:50 AM, SONDEREGGER 105

How Do Migratory Birds Use the Urban Landscape in Madison, WI?

Blake Bierl

Mentor: Nikki Kime, Jake Griffin

As Madison, Wisconsin's population continues to rise, it is important that the continued urbanization of the landscape does not impact native species, specifically birds. Madison has numerous landscapes that provide ideal resources as stopover sites for migratory birds, whether it be the city's lake system or numerous urban forests. Studies similar to my own have shown that richness of avian species is greatest in areas that have moderate disturbance. I hypothesized that migratory birds would likewise show a trend toward using residential cover types and favor the Picnic Point park, an area of moderate disturbance. In our research, we studied four regions in Madison, WI. Each of those regions had four cover types: open, forest, residential, and urban. We then used the circular-plot method to identify avian populations via sight or sound of birds during a 10 minute period. We visited each site eight times, four times in the morning, and four times in the evening. We successfully identified 1,552 birds in 32 observations. When both migrant and residential birds were included in the analysis, Picnic Point showed greater richness and abundance in the avian species present. Species richness refers to the total number of species while abundance is total number of birds. There was no difference among sites in richness or abundance of migratory birds. Further data collection across multiple springs and in the fall would provide a more clear summary of how migratory birds use the urban landscape of Madison, WI during their migration.

10:00 AM - 10:50 AM, SONDEREGGER 108

The Effect of Black Cohosh Tea on Apoptosis in a Post-menopausal Breast Cancer Cell Line Using PCR

Mariah Walton (*Honors Scholarship Project*)

Mentor: Jessica Heckman

About 1 in 8 women will get breast cancer in their lifetime and women's risk increases with age, peaking in the post-menopause years. During menopause, estrogen

levels plummet and in order to ease the symptoms of menopause, some women take phytoestrogens (plant-based estrogens) such as those in Black Cohosh tea. The purpose of this study was to determine the effect of Black Cohosh tea on one mechanism crucial for the growth of cancer cells, the process of apoptosis (programmed cell death). In order to study its effect on apoptosis, we measured the mRNA levels of three proteins involved in apoptosis (namely Bcl-2, Bax, and Bcl-XL) in breast cancer cells of a post-menopausal woman. We divided the breast cancer cells into two groups, one control group (water) and one treatment group (Black Cohosh tea) and treated the samples for 24 hours before collecting RNA and performing PCR. We hypothesized that there would be an overall decrease in apoptosis, leading to increased cell survival rates driving the breast cancer growth. Of the three genes that we looked at, the major inhibitor of apoptosis, Bcl-2, experienced an increase in gene expression levels, which supported my hypothesis. Therefore, the conclusion was that Black Cohosh tea causes an increase of Bcl-2 mRNA levels in breast cancer cells of post-menopausal women, indicating that apoptosis is decreasing, leading to increased tumor growth. This conclusion indicates that more research is needed into the safety of this natural remedy.

10:00 AM - 10:50 AM, SONDEREGGER 104

Gel Electrophoresis Demonstrates that the Presence of a Species-specific DNA Sequence Does Not Induce DNA Strand Displacement in a Custom DNA-based Molecular Sensor

Ashley Reeson

Mentor: Pete Kuhn

Project funded by an Ebben Fund Grant for Undergraduate Student Research

DNA based molecular devices can be designed as an approach to better distinguish between two nearly identical species. In this study, *Celastrus orbiculatus* is an invasive plant species that looks very similar to a native plant species, *Celastrus scandens*. The best way to distinguish between these two species of plants is in the Fall when they are fruiting. Invasive species are a big threat to native ecosystems so by developing a new way of distinguishing between a native and invasive species, we can help to combat these invasive species year round. The DNA based molecular device used in this study to distinguish between the 2 species is a G-quadruplex. Q-quadruplexes form through Hoogsteen base pairing, which is when guanines bind to guanines, rather than through typical Watson and Crick base pairing where a guanine would bind to a cytosine. A series of guanine rich DNA sequences were designed to interact with DNA extracted from one of the two highly similar plant species and form a G-quadruplex. Gel electrophoresis is used to demonstrate that the input sequences seen in previous experiments did in fact allow for the output sequences to be displaced from the sensor sequence and allow for output sequences to form these guanine rich G-quadruplexes.

11:00 AM - 11:50 AM, SONDEREGGER 108

Production of Bacteriophage Cocktail for Treatment of Wastewater Facility Biosolids

William Bull

Mentor: Zach Pratt

Project funded by an Ebben Fund Grant for Undergraduate Student Research

Biosolids are the organic recycled solids produced from the treatment of wastewater. At the Madison Metropolitan Sewerage District (MMSD, Madison, WI), biosolids are digested anaerobically at 70°C for 14 hours, and then dewatered. Though anaerobic digestion is a validated method to reduce the concentration of coliform bacteria, there is a documented rapid regrowth of bacteria following this process. The MMSD allows their biosolids to age for five weeks resulting in a reduction in coliform concentrations. The biosolids are ultimately land applied and used as fertilizers.

Our research investigated the development and implementation of a cocktail of bacteriophages as a treatment to decrease bacterial concentrations and the holding time of biosolids. Bacteriophages capable of infecting *Escherichia coli*, were isolated from influent sewage water from MMSD. Following the isolation of bacteriophages, the receptor to which each phage attached was identified using a deletion-library of *E. coli* K12 clones. Additionally, we determined how frequently populations of *E. coli* strain K12 showed resistance to the phages.

Finally, *E. coli* K12 was grown in LB broth cultures with individual bacteriophages or a cocktail of bacteriophages to determine the ability of the bacteriophages to inhibit the growth of *E. coli*. Our data indicates individual bacteriophages and a cocktail of bacteriophages effectively inhibit the growth of *E. coli* (T-Test, $P < 0.05$). However, these data also suggest the cocktail of bacteriophages did not exhibit a synergistic effect on growth inhibition of *E. coli* (T-Test, $P > 0.05$). The characteristics of these phages and intent for their use in biosolids will be discussed.

11:00 AM - 11:50 AM, SONDEREGGER 105

Effects of Red Clover Tea on Breast Cancer Cell Apoptosis

Cody Schumacher

Mentor: Jessica Heckman

Menopausal symptoms such as hot flashes, sleep disturbances, and mood changes are commonly treated with polyphenols, multi-ringed compounds found in certain types of teas, because of their ability to alleviate the discomfort associated with these symptoms. Red Clover Tea is frequently used for this purpose; however, it has also been shown to increase the risk of breast cancer cell growth. Determining if these polyphenols are safe for women who are at a higher risk for breast cancer is important because they could be increasing their risk of developing breast cancer. To determine the safety of Red Clover Tea, an experiment was conducted that involved exposing breast cancer cells to either Red Clover Tea or water, which acted as a control group. It was hypothesized that the Red Clover Tea would decrease apoptosis, a mechanism of cancer growth, in the treated breast cancer cells. In order to test this, three proteins involved in apoptosis were measured for their gene expression using PCR. It was determined that the gene expression of Bcl-XL, an inhibitor of apoptosis was decreased significantly. The results obtained determined that Red Clover Tea decreased apoptosis, allowing for breast cancer cells to grow at a quicker rate than the control group. This suggests that Red Clover Tea may not be safe for women to consume if they are at a higher risk for breast cancer.

11:00 AM - 11:50 AM, SONDEREGGER 104

How Does Landscape Context within an Urbanization Gradient Affect Avian Communities at Different Spatial Scales?

Angela Dailey

Mentor: Jake Griffin, Nikki Kime

Bacteriophages are viruses that are capable of infecting bacterial cells. They infect bacterial cells by attaching and injecting its genome into the host. Once inside the host, it overrides the cell machinery to create new viral particles that will lyse the cell. Even though there is a lot known about bacteriophage infectivity, there are still more questions to be answered. In order to learn more about bacteriophage characteristics, an experiment was set up to isolate a virus that infects *Pseudomonas fluorescens*. The bacteriophage sample was obtained from a sewage treatment plant. The sewage water sample was filtered, plated and incubated with *P. fluorescens* to allow the virus to inject its genomic material into the host. A single phage from the plaque was isolated and allowed to grow on a nutrient rich media. The phage genome will be annotated and analyzed in order to categorize it into one of the three bacteriophage families; Myoviridae, Podoviridae, or Siphoviridae. The categorical prediction will be based on the similarities of the structural proteins found within the phage genome.

1:00 PM - 1:50 PM, SONDEREGGER 108

Effective G-quadruplex Activation by DNA Strand Displacement is Dependent on the Specific Design of DNA-based Molecular Sensors

Shanaya Hebgen

Mentor: Pete Kuhn

DNA and RNA sequences have been utilized to create molecular machines that ultimately perform a larger overall function. The molecular machine in this study is a molecular sensor that only functions with a specific DNA sequence input. DNA displacement involving five specific DNA sequences allows for the continuation of the cycle. In the displacement process, some DNA sequences are kicked off and form a G-quadruplex. A G-quadruplex is a DNA sequence that can act as a catalyst. The G-quadruplex catalyzes a redox reaction that involves peroxide, hemin, and ABTS. When oxidized, the ABTS turns green which is identified by the UV-Vis spectrometer. G-quadruplex formation, and thus the related color change, is only possible in the presence of a specific DNA sequence. The purpose of this study was to analyze and determine the functionality of a cyclical reaction that is able to activate the G-quadruplex. The results of this research suggests that multiple elements of the cycle are working as designed, but DNA strand displacement is not occurring at a level sufficient to activate the G-quadruplexes. While the overall reaction did not show a significant increase in the rate of G-quadruplex formation ($p < 0.05$), activation was observed in an intermediate complex ($p < 0.05$). This could be used in the future to detect specific DNA sequences to differentiate species.

1:00 PM - 1:50 PM, SONDEREGGER 104

The Effect of Bile Salts on OmpX Regarding micF in E. coli

Julia Snell

Mentor: Zach Pratt

Bile salts are detergents made by the liver and secreted into the intestine for enzymatic digestion of fats. In addition, they are strong antimicrobials that disaggregate the lipid bilayer structure of cellular membranes. Being as E. coli thrive in these conditions, it raises particular interest as to how. Our research aims to answer the question as to how the outer membrane proteins, specifically OmpX, contribute to the survival of E. coli in the presence of bile salts. It is understood that the presence of OmpX is required for growth in the presence of bile salts, but the mechanism is unclear. One possibility is that OmpX activates the expression of a small, non-coding RNA, micF, that blocks the translation of the OmpF protein. A plasmid was created that contained the micF promoter upstream of lacZ. The plasmid was transformed into E. coli MG1655 and gel electrophoresis results revealed the reporter plasmid was successfully transformed into cells. In the future, experiments will be conducted to determine if micF is expressed in E. coli in the presence of bile salts and, if so, how OmpX effects the expression of micF. The amount of beta-galactosidase that the cells produce will allow us to determine the activation of the micF promoter.

2:00 PM - 2:50 PM, SONDEREGGER 104

Using Classical Conditioning and TrkB Antagonist through Conditioned Place Preference to Reduce Ethanol Preference in Zebrafish

Brittany Grafton

Mentor: Brenda del Moral

The way humans learn to like or avoid something can be explained by one, simple, learning technique—classical conditioning. This technique of connecting a reinforcer with a substance is the same way that people who are addicted to drugs develop preferences for them, which are difficult to remove. This study tested classical conditioning with conditioned place preference (CPP) in attempt to reduce a learned preference for ethanol using a TrkB antagonist called ANA-12. ANA-12 is an antidepressant that has been shown to reduce preference for other drugs using a mechanism that blocks neurotrophic activity of the brain-derived neurotrophic factor, which is associated with making new neuron connections in the brain during learning. Thirty-six zebrafish (*Danio rerio*) were placed in the tank to determine if they initially preferred the dotted or white side. Then they were trained to associate ethanol with the side opposite of their initial preference. One group of fish were placed in ANA-12 before being exposed to ethanol in attempt to reduce the effect ethanol would have on making that learned connection between the reward and the trained side of the tank. Results indicated that training with ethanol does work in producing a change in preference; however, the drug ANA-12 had no significant effect on the ethanol-induced preference. Further suggestions to this research would be to extend the training sessions with ANA-12, making sure that the length of time for exposure to the antidepressant is enough to cross the blood-brain barrier and have an effect on the zebrafish.

Keywords: Conditioned Place Preference, Ethanol, TrkB ANA-12, Addiction, classical conditioning

2:00 PM - 2:50 PM, SONDEREGGER 108

Effect of Advanced Care Plans on Stress and Anxiety of Advanced Cancer Patients: A Literature Review

Kami Doberstein

Mentor: Jessica Heckman

Advance care plans are a means by which patients can anticipate and analyze future potential health situations and make decisions about what their preferred treatments in each situation would be, should they no longer be able to express those wishes themselves in the future. Diagnosed advanced cancer patients have a short amount of time in which to make treatment decisions, so this study searched the scientific literature for studies about cancer patients with advance care plans that also looked at the stress or anxiety levels of each patient with or without the advance care plan to determine whether or not the presence of an advance care plan affected stress or anxiety at end of life. It was hypothesized that having an advance care plan would significantly decrease the stress or anxiety of an advanced cancer patient at end of life. Meta-analysis of four published scientific studies, involving a total of 928 patients, revealed that advance care plans decreased stress or anxiety overall in advanced cancer patients across all studies. Furthermore, when prompting assistance programs were utilized to help families make plans, stress and anxiety were further reduced. While the decrease in stress or anxiety was not always statistically significant, advance care plans did not induce or create a higher level of stress or anxiety in patients. The limited availability of studies relevant to this question prompts further investigation of the resources for patients regarding advance care planning.

I would like to extend my sincere thanks to the Edgewood Engaged Advisory Board: Gerardo Mancilla, Rebecca Meier-Rao, Annette Mondry, Suzanne Otte Allen, Zach Pratt, Lori Severtson, and Ferrinne Spector. I would also like to thank the Speaker Selection Committee: Geoff Adelsberg, Pete Kuhn, Lori Severtson, Bonnie Sierlecki, Atreyee Sinha, and Nancy Kern. -- Shad Wenzlaff

STUDENT RESEARCH AND CREATIVE INQUIRY at Edgewood College

Edgewood Engaged 2018 will offer a student an opportunity to receive a \$100 prize for each of the following:

Best Undergraduate Project, Best Graduate Project, and People's Choice Award for Best Poster-Session Poster. Please join us in Predolin Hall at the Thursday afternoon poster session to vote for People's Choice Award for Best Poster. The ballot boxes will be located outside of Anderson Auditorium, and in the Wingra Cafe from 2-3:00 PM. The winners of the People's Choice Award will be announced at the Keynote Presentation beginning at 6:15 PM in Anderson Auditorium.

Research and Creative Inquiry Project Funds and Travel Grants are available to both undergraduate and graduate students. Undergraduate students receive up to \$750 to present, or \$300 to attend, professional and academic conferences. Applications are received throughout the year. Please contact Dr. Kris Mickelson, Dean, School of Integrative studies: kmickelson@edgewood.edu

Graduate students can apply through their school for up to \$500.

NATIONAL CONFERENCE ON UNDERGRADUATE RESEARCH 2019

Attention undergraduate students: By presenting at Edgewood Engaged 2018, you are eligible to apply for a travel grant to present your research at NCUR 2019. Held April 11-13, 2019 at Kennesaw State University in Georgia, NCUR offers students a chance to present research at a national symposium. NCUR holds a separate peer review process. Please inquire for more information: swenzlaff@edgewood.edu Faculty mentors: Please nominate your eligible student before September 30, 2018.

STUDENT RESEARCH AND CREATIVE INQUIRY GRANTS

Both the Ebben Fund for Undergraduate Research and the Summer Research Program afford undergraduate students opportunities to pursue a research or creative inquiry project. Applications are reviewed twice per semester for students with a qualifying GPA and who are enrolled in good standing. Projects must be presented publicly at Edgewood Engaged. Information is available through Shad Ryan Wenzlaff. We are pleased to announce grants for student research for Summer 2018 have been awarded in the following disciplines: Art History, Biological Sciences, Computing and Information Sciences, Psychology, and Interdisciplinary Technology. Students receive a \$1,200 stipend to support their summer project.

Undergraduate student applications for the Summer 2019 program are due February 20, 2019.

For more information about the Student Research Program at Edgewood College, please refer to our webpage: studentresearch.edgewood.edu



EDGEWOOD COLLEGE

1000 Edgewood College Dr
Madison, WI 53711
www.edgewood.edu

