



MONMOUTH
UNIVERSITY

HONORS
SCHOOL

THE HONORS SCHOOL

RESEARCH CONFERENCE

FALL 2024

FALL 2024 HONORS SCHOOL RESEARCH CONFERENCE SCHEDULE

FRIDAY, DECEMBER 6, 2024
GUGGENHEIM MEMORIAL LIBRARY ROOM 101

OPENING REMARKS:
Acting Dean Jennifer Ross

SESSION A: 10:50AM - 11:45AM

Deirdre Campbell, *Chemistry (Biochemistry)*
Madison Pellerito, *Chemistry/Biochemistry Track*
Madison Patterson, *Biology*
Leila Carl, *Business Administration (Marketing & Management)*

SESSION B: 11:55AM - 12:50PM

Natalie DellaRagione, *English & Secondary Education*
Jill Bodiford, *English & Education with Endorsement in
Elementary Education in English*
Meghan Reilly, *English*

SESSION C: 3:30PM - 4:15PM

Grace Evans, *Health Studies/Health Science Cluster*
Bianca Morrongiello, *Health Studies/Health Science Cluster*
Lincoln Pereira, *History & Secondary Education*

THESIS ABSTRACTS

Deirdre Campbell | FIRST READER: DR. JONATHAN QUELLET
SECOND READER: DR. DAVIS JOSE

Isolation of an Aptamer Selective to Glucose

The research for a glucose aptamer would be the first step to finding a cure for diabetes. This project uses Systematic Evolution of Ligands by Exponential Enrichment, or SELEX, to select RNA that specifically binds glucose. The process is a cycle beginning with a PCR from a pool with millions of different DNA sequences, transcription to RNA, negative selection, positive selection, and reverse transcription back to DNA. The conclusion of the reverse transcription is the beginning of the next generation, where each generation becomes more selective to glucose. Eventually the RNA would be sequenced and converted to a riboswitch. The riboswitch would bind specifically to glucose and transmit a signal to the expression platform to start the reaction to make insulin. This would allow the body to make insulin outside of the pancreas; therefore, eliminating the need for insulin injections. The project is analyzed by cleavage percentages of each selection for every generation. Once a high ratio of positive over negative cleavage percentages is obtained, we will begin the process to clone DNA and individually test sequences to find an aptamer that cleaves only in the presence of glucose.

Madison Pellerito | FIRST READER: DR. JONATHAN OUELLET
SECOND READER: DR. DAVIS JOSE

The Catalytic Chemistry of the I-R3 DNA Enzyme through Ion-Promoted Cleavage

Synthetic DNA enzymes cleave the phosphodiester bonds found in DNA acting as a sort of DNA scissor. In the I-R3 DNA enzyme, the catalytic core forms an asymmetrical loop when annealed to its DNA substrate. When this structure is in the presence of Zn^{2+} under neutral pH, the substrate strand will be cleaved, resulting in two products. This project is designed to study the cleavage behaviors of the I-R3 DNA enzyme through substituting different metal ions for zinc based on their similarities to the atomic radii size of zinc, providing information on the DNA-cleaving DNA enzymes (DCDEs) catalytic function and potential biological applications in targeting single-stranded viral DNAs. The current hypothesis is that metal ions of similar atomic radii size to zinc may promote the cleavage activity of the DCDEs. Through urea-polyacrylamide gel electrophoresis, the cleavage activity of the DCDE was optimized at 75.2% using 100 mM NaCl with 10 mM $ZnCl_2$. Using these conditions in fluorescence spectroscopy, the average melting point of the DCDE complex was $84 \pm 3^\circ C$. More testing is required to confirm these results, along with ensuring the parameters of the fluorescence kinetic assay are optimal before testing the substituted metal ions in future research.

Madison Patterson | FIRST READER: DR. SEAN STERRETT

Evaluating Predation Risk of Eastern Box Turtles (*Terrapene carolina carolina*) in a Suburban Island in Monmouth County, New Jersey

Globally, reptile populations are on a staggering decline, and turtles are especially at risk, with one of the leading causes being habitat loss. Eastern Box Turtles (EBT) are terrestrial turtles that are vulnerable across their range, and a species of special concern in New Jersey. One factor affecting box turtle populations aside from habitat loss are predators impacting nest success by consuming box turtle eggs and hatchlings. It is known that there may be an increased abundance of opportunistic, generalist mammalian predators in urban environments. However, there is little research on how an influx of urban-adapted mesopredators may affect nesting success of box turtles found in habitats facing urban encroachment. In this study, I deployed motion and heat activated camera traps to understand the mammalian mesopredator community in a local conservation area with a known EBT population surrounded by human development. I then created artificial EBT nests adjacent to camera traps to observe the predation rate of box turtle eggs in this park, and which predator species were found to depredate them. I found a 91% depredation rate of artificial nests. This information can be used to inform management decisions to protect an already sensitive population of a vulnerable species.

The Downfall of Blockbuster Video Inc.: A Case Study in Strategic Management Failure to Adapt to Disruptive Innovation

The collapse of Blockbuster Video Inc. was nothing short of shocking, as the company fell from industry giant to bankruptcy in a remarkably short period of time. This case study analyzed Blockbuster's decline, focusing on its failure to adapt to technological advancements and shifting consumer behaviors. Accompanied by a teaching note, the study aimed to provide educators with tools to integrate the case into their curriculum and facilitate student discussions through targeted questions. Using a qualitative approach, the research examined Blockbuster's business strategies, competitive landscape, and critical missteps, comparing them to successful competitors like Netflix. A SWOT analysis offered a detailed look at the company's internal and external challenges, highlighting missed opportunities and unleveraged strengths. Secondary data revealed Blockbuster's resistance to innovation and neglect of the streaming market as central factors in its downfall. The findings emphasized that Blockbuster's lack of adaptability and customer focus led to its demise. This case study and teaching note provided valuable insights into navigating disruptive innovation and maintaining a competitive edge. The materials encouraged students to think critically about business strategy, leadership, and adaptability in rapidly evolving industries, preparing them for future leadership roles.

To What Extent Does Gun Violence in Public Schools at the National Level Affect Teachers at the Local Level Where Gun Violence Has Not Occurred?

This study intends to research the impact of potential for gun-related violence in schools, specifically in Red Bank Regional High School. The main purpose of this qualitative study is to educate school faculty on the increasing issue of gun violence in schools and to understand how new protocols regarding gun violence are impacting them socially and emotionally. Interviews were conducted with teachers and administrators at Red Bank Regional High School with questions related to gun violence, safety protocols, and the impacts on their mental health. It was found that gun violence directly affects the lives of teachers. The participants shared they feel that lockdown drills have lost their initial effect, now only instilling fear in students for what could potentially happen. Schools need to address this issue to ensure that students and faculty are well-prepared in the time of an emergency without fearing heavily for their lives. With this, comes understanding of the issue at hand. In the field of education, it is important to understand the severity of this increasing issue, as preparedness comes with prior knowledge.

Jill Bodiford | FIRST READER: DR. DAVID TRIPOLD

Theatre Saved My Life: The Benefits of Theatre Activities and its Crucialness in Public Schools

The focus of this thesis examines the vital role of musical theatre programs in schools, nurturing creativity, teamwork, and essential life skills, offering a unique space for personal and academic growth. The sad reality is that theatre programs are struggling to survive, facing budget cuts that threaten their existence. Through a blend of literature review and data analysis, this research underscores the social, emotional, and academic benefits of theatre participation, highlighting its positive effects on communication, problem-solving, leadership skills, and more. The thesis also explores alternative ways to integrate theatre into the traditional curriculum, proposing solutions to address funding challenges. A sample unit plan included in the appendix illustrates how theatre can be adapted within classrooms, advocating for policies to support and protect these programs. This thesis strongly emphasizes the importance of preserving musical theatre in schools as a core component of a well-rounded education for future generations.

Meghan Reilly | FIRST READER: DR. STANLEY BLAIR

Writing Oneself into Existence: Binary Dilemmas and Hybridity in Judith Ortiz Cofer's *Silent Dancing: A Partial Remembrance of a Puerto Rican Childhood*

This paper provides a content-based literary analysis of Judith Ortiz Cofer's coming-of-age book *Silent Dancing: A Partial Remembrance of a Puerto Rican Childhood*. The book recounts her adolescence in Paterson, New Jersey, and Hormigueros, Puerto Rico. The book engages readers in meaningful ambiguities of postcolonial concepts of subaltern, metropole, and hybrid borderland. These ambiguities are expressed partly through language conventions of literary genres, storytelling media, and written languages. For example, the book uses typographical and rhetorical strategies to normalize Spanish-only words for English-only readers. Such ambiguities are also expressed through the intersection of gender, class, and ethnicity. Through such language conventions and intersectionality, the book expresses binary either/or alternatives, subaltern resistance or subaltern conformity, but deconstructs these binaries through both/and borderland hybridizations that mutually integrate both alternatives into coherent wholes. The thesis presents a methodology for reading the entire book but applies that methodology to the literary scope of "Casa," the book's first frame narrative.

Promotion of Successful Aging in the United States

As the population of older adults in the United States of America and around the world grows to an unprecedented size, it is more important than ever to focus on the treatment and care shown to seniors in order to improve mental and physical health outcomes later in life. This area of study is more qualitative than it is quantitative in nature, allowing room for biases and opinions, but is a very important and neglected conversation for society as a whole to take part in. When looking at this issue, it is important to acknowledge that understanding its entire scope involves understanding the life experiences of individuals. This project focuses on the positive and negative impacts of the following themes: misconceptions of older adulthood, social isolation, healthcare staffing, care and practices in healthcare, aging in place, and global perspectives and practices. Research found room for improvement in the above areas and was completed through a review of previous literature. Findings manifested in educational materials which can be used for students entering healthcare fields, those who are responsible for caring for older adults in their life, as well as the general population in order to promote inclusivity and understanding on a broader scale.

Ethical Reasoning in Plastic Surgery

Plastic surgery has become a popular specialty within the medical community and has been growing as a social trend due to the presence of social media and reality TV. As a result, the quality of care of physicians is important to examine because patients can lose sight of appropriate vs. inappropriate procedures due to confounding outside influences. Various advertisements and/or marketing techniques that may result in undue influence towards procedures that may not be ethically sound is an ongoing problem. In addition, it is important to examine not only the consent process with plastics patients, but also the medical training necessary to enter this field with appropriate moral and ethical principles. The Belmont report is imperative to not only understand and implement, but there is also a need to ensure these ethical principles are taught at all levels of medical school, as well as enforced once medical professionals begin practicing.

“Justice Through Science”: Teaching Antifascism and Queer Acceptance Through Weimar Germany

This project was created to provide a framework for teachers looking to include queer historical figures in their lessons, using Magnus Hirschfeld and his Institute of Sexual Science as an example/starting point. This project aims to expand the breadth of Holocaust history to include Hirschfeld, a prominent Weimar figure whose research was among the first institutions targeted by Nazi censorship during the onset of the Third Reich. It also seeks to expand on student understanding of the telltale signs of fascism, focusing on anti-intellectualism and the scapegoating of minorities primarily. The research was completed during Fall 2023 and Spring of 2024 to construct my history senior seminar paper on Hirschfeld's work. The research paper was then synthesized into an Inquiry Design Model (IDM) and three sample lesson plans that teachers may use, in part or in full, in European history and genocide studies courses. All of the work has been compiled onto a website for public use. I hope to present my work at future education conferences for the expansion of queer theory in high school and higher educational spaces.

**THANK YOU
FOR ATTENDING**

OUR MISSION

The Honors School promotes transformative learning in a collaborative community of student leaders and faculty mentors both inside and outside of the classroom. Students challenge one another to maintain the highest standards in their own discipline and across all fields of interest. Student scholars in the Honors School are expected to develop a great depth of understanding within their field of study, while appreciating intellectual inquiry in a broad context. Participants in the Honors School raise students' cultural, ethical, and social awareness as they develop into well-rounded scholars and citizens of a global community.