



TRANSFORMATIONS

A STUDENT RESEARCH AND CREATIVITY CONFERENCE

April 30 & May 1, 2026

Transformations 2026 Events

THURSDAY, APRIL 30 - KEYNOTE

4:30-5:30 – SPERRY 104

Dr. Andrea Dávalos (she/ella) is an Associate Professor of Biological Sciences

2026 Dr. Peter A. DiNardo '68 and Judith Waring Outstanding Achievement in Research Award

Keynote Presentation: Don't Jump to Conclusions: We Know Less About Invasions than We Think

FRIDAY, MAY 1

10:20-4:00 - BOWERS

PRESENTATION SESSIONS

POSTER PRESENTATIONS

10:20-11:20 Session 1

11:30-12:30 Session A

12:40-1:40 Session 2

1:50-2:50 Session B

3:00-4:00 Session 3

Transformations: A Student Research and Creativity Conference is an event designed to highlight and encourage scholarship among SUNY Cortland students. Our scholarly work is crucial to who and what we are as individuals and as an institution. This day is an attempt to help our students and the general public understand and appreciate what we do, to draw students into the intellectual life and the excitement of scholarly work, and to publicize the accomplishments of our students. Support for Transformations has been received from the President's Office and the Provost and Vice President for Academic Affairs Office.

OUR APPRECIATION TO THE TRANSFORMATIONS COMMITTEE:

Christopher Badurek, Geography

Erin Morris, Sport Management

Martine Barnaby, Art and Art History

Jason Parks, Kinesiology

Laura Eierman, Biological Sciences

Kimberly Rombach, School of Education

Jeremy Jimenez, Foundations and Social Advocacy

Meghan VanDeuson, Arts and Sciences

Lily Liang, Sociology and Anthropology

Alexandra Vizgaitis, Psychology

Bruce Mattingly, Arts and Sciences (Chair)

Hilary Wong, Memorial Library

**2026 Dr. Peter A. DiNardo '68
and Judith Waring Outstanding
Achievement in Research Award**

**Award Recipient:
Dr. Andrea Dávalos
Associate Professor of Biological Sciences**



Keynote address: Sperry 104, 4:30 PM

Don't Jump to Conclusions: We Know Less About Invasions than we Think

Bio:

Dr. Andrea Dávalos (she/ella) is an associate professor in the Biological Sciences Department. At her lab, Dávalos studies the ecological impacts of invasive species and potential options to manage them, including biocontrol. She is investigating jumping worm impacts within the framework of multiple stressors, such as deer browse or invasive plant competition. She is also exploring current assumptions about jumping worm spread by tracing their expansion from known introduction points in urban parks.

Dávalos grew up in the mountains of Ecuador and studied biology at the Pontifical Catholic University of Ecuador, before receiving her PhD at Cornell University. She also worked in sustainable harvest management in Ecuadorian rainforests and consulted on Ecuadorian conservation lands before arriving at SUNY Cortland in 2016.

Group Presentations

Session: 1

10:20-11:20 - Bowers 1213

Faculty Moderator: Mark Dodds, Sport Management

Legal Analysis of Health Issues in Women's Sports

This presentation examines key legal issues in women's sports. It focuses on three major areas: pregnancy, sexual assault, and mental health, highlighting how each impacts an athlete's well-being, performance, and career longevity. The discussion includes real-world cases of negligence that reveal systemic problems, lack of support, and the need for greater protection and awareness. It also examines opposing perspectives, such as controversial policies and practices, and considers unintended consequences that can arise from institutional responses. Overall, the presentation emphasizes the importance of improving awareness, support systems, and policies to better protect and empower women in sports.

Faculty Mentor: Mark Dodds, Sport Management

Student Presenters:

Isabella Docker, Junior, Sport Management

Olivia Jonas, Junior, Sport Management

Joslyn Maciak, Junior, Sport Management

Session: 1

10:20-11:20 - Bowers 1208

Global Model European Union 2026

Faculty Moderator: Scott Moranda, History

Heads of Government

Presenters will be students who played the roles of Heads of Government in the Global Model European Union conference and simulation in Brussels, Belgium in January 2026. Global Model European Union (GMEU) is a simulation of the European Council and some of its various configurations. A GMEU team has up to four delegates and participants must research their roles so they can make proposals and negotiate as the actual delegates would do. Participating colleges are assigned one of the 27 EU member countries, and two of the three students adopt the roles of the Prime Minister or President, and Foreign Minister. The remaining students were a part of one of the configurations of the Council of the European Union, addressing concerns such as the Environment or Health or Defense.

Faculty Mentors: Scott Moranda, History, Alexandru Balas, International Studies

Student Presenters:

Layla Myers, Senior, International Studies; Ava Graziano, Senior, Community Health

Foreign Ministers

Students who represented Poland and Denmark in the Foreign Ministers council will present about their experiences preparing for and participating during the Global Model European Union conference and simulation in Brussels, Belgium in January 2026. Global Model European Union (GMEU) is a simulation of the European Council and some of its various configurations. A GMEU team has up to four delegates and participants must research their roles so they can make proposals and negotiate as the actual delegates would do. Participating colleges are assigned one of the 27 EU member countries, and two of the three students adopt the roles of the Prime Minister or President, and Foreign Minister. The remaining students were a part of one of the configurations of the Council of the European Union, addressing concerns such as the Environment or Health or Defense.

Faculty Mentors: Scott Moranda, History, Alexandru Balas, International Studies

Student Presenters:

Maria Fernandez, Sophomore, International Studies

Emma Caraher, Senior, Anthropology

Defense Ministers

Students who represented Poland and Portugal in the meeting of European defense ministers will present about their experiences preparing for and participating during the Global Model European Union conference and simulation in Brussels, Belgium in January 2026. Global Model European Union (GMEU) is a simulation of the European Council and some of its various configurations. A GMEU team has up to four delegates and participants must research their roles so they can make proposals and negotiate as the actual delegates would do. Participating colleges are assigned one of the 27 EU member countries, and two of the three students adopt the roles of the Prime Minister or President, and Foreign Minister. The remaining students were a part of one of the configurations of the Council of the European Union, addressing concerns such as the Environment or Health or Defense.

Faculty Mentors: Scott Moranda, History, Alexandru Balas, International Studies

Student Presenters:

Maddie Houghton, Sophomore, International Studies

Carly Hammond, Sophomore, Archaeology

Environmental Ministers

Zach, who represented Portugal in the meeting of European environmental ministers, will present about his experiences preparing for and participating during the Global Model European Union conference and simulation in Brussels, Belgium in January 2026. Global Model European Union (GMEU) is a simulation of the European Council and some of its various configurations. A GMEU team has up to four delegates and participants must research their roles so they can make proposals and negotiate as the actual delegates would do. Participating colleges are assigned one of the 27 EU member countries, and two of the three students adopt the roles of the Prime Minister or President, and Foreign Minister. The remaining students were a part of one of the configurations of the Council of the European Union, addressing concerns such as the Environment or Health or Defense.

Faculty Mentors: Scott Moranda, History, Alexandru Balas, International Studies

Student Presenter:

Zach Biemer, Senior, Geographic Information Systems

Session: 2

12:40-1:40 - Bowers 1213

Understanding Privilege, Power, and Poverty Through Anthropological Research

Faculty Moderator: Sharon Steadman, Anthropology

National Security as Justification for Cultural Suppression: The Case of WW II Internment Camps

This presentation explores the lives of Japanese Americans forced into internment camps during World War II. A combination of archaeological, ethnographic, and historical evidence shows that their forced living arrangements, work, and educational structure within the camps resulted in significant levels of cultural loss. The presentation will address whether the stated reason of national security can be used to justify the cultural loss of tens of thousands of Americans.

Faculty Mentor: Sharon Steadman, Anthropology

Student Presenter:

Mackenzie Blackburn, Junior, Anthropology

The Lasting Effects of the Buffalo Massacres

The mass killing of the American buffalo in the nineteenth century initiated short and long-term impacts on the Native American populations of the Great Plains that many communities still feel today. This presentation will review why the bison were so important to the Native communities on the Great Plains, and offer a comparison of the health and well-being of Native Americans in the region before and after the US government's planned bison hunting. This research will show the devastating effects of the bison massacre on the humans who depended on them for their livelihood.

Faculty Mentor: Sharon Steadman, Anthropology

Student Presenter:

Madison Houghton, Sophomore, Archaeology

The Language of Clothing: Feminine Power Through Textiles

This presentation will discuss two items of clothing in the Brooks Museum collection. One of these is an Egyptian scarf decorated with metal coins around the perimeter. It is commonly worn by women during dance performances. The second item to be discussed is a Cheongsam Chinese silk blouse, a clothing style that can be traced back to the Qing Dynasty (1644 -1911). This type of garment continued to be worn during the Republic era in China (1912 -1949), primarily by women. The presentation will demonstrate how both garments served as visual representations of feminine power and privilege.

Faculty Mentor: Sharon Steadman, Anthropology

Student Presenter:

Abby Engler, Senior, Anthropology

From Rags to Riches: The Conservation of a Rag Doll.

Children's toys, including the clothing on the dolls they played with, can tell the story of privilege and poverty based on the materials they are made of. The types of toys children owned are often indicators for the status of their families. The American rag doll emerged in the 1700s, made by families who had little extra income to purchase store-bought toys for their children. A rag doll in the Brooks Museum dates to the late 19th or early 20th century. This presentation will review the conservation process undertaken on the museum's rag doll to restore this rare item for display and future study.

Faculty Mentor: Sharon Steadman, Anthropology

Student Presenter:

Carly Hammond, Sophomore, Archaeology

Session: 2

12:40-1:40 - Bowers 239

Research in International Studies

Faculty Moderator: Alexandru Balas, International Studies

The Importance of Repatriation in International Cultural Heritage

Repatriation, in a socio-cultural and historical context, is the return of someone or something to the country it originated from. Across the globe, Western countries tend to hold onto a shared cultural history of human society to reinforce their right to retain traditional heritage patrimony of origins outside their own. If an object is historically important in the context of the human species and the development of civilization, wealthy countries want to govern the intellectual value that piece of humanity has. Human culture binds all people together, and all should learn from our shared history. It becomes a problem when the younger generation learns to give away their own cultural heritage for the benefit of foreign powers they understand little of. Institutions and nations that house looted goods need to recognize that the removal of objects from their ancestral context steals the cultural knowledge from the very people it came from, thus interrupting the creation of more.

Faculty Mentor: Alexandru Balas, International Studies

Student Presenter:

Sophia Peterson, Junior, International Studies

Violence Against Women in the Holocaust

I have researched the experiences of Jewish women during the Holocaust, with a particular focus on the sexual violence they endured within concentration camps. This study highlights Ravensbrück concentration camp, the largest camp for women in Nazi Germany, where thousands faced gender-specific forms of abuse, exploitation, and medical experimentation. Auschwitz-Birkenau concentration camp is also featured. This research will also touch on how female guards were just as guilty as male guards in carrying out acts of cruelty and violence. While many students are introduced to the Holocaust in grade school, instruction often remains general and does not address the distinct experiences of women. This research aims to shed light on an often overlooked aspect of Holocaust history by examining the conditions, treatment, and experiences unique to women in these camps. By bringing attention to this topic, the work contributes to a more complete understanding of the Holocaust and the suffering endured by its victims. Due to the nature of this topic, the material presented is sensitive and may be triggering for some audiences.

Faculty Mentor: Alexandru Balas, International Studies

Student Presenter:

Sylvia Rosa, Senior, International Studies

Impacts of the Australian Political Parties: Do they "Close the Gap" for Aboriginal Cultures of Australia and Torres Strait Islanders?

This paper demonstrates the effects of two of Australia's political parties, the Australian Labor Party (ALP) and the Liberal Party of Australia on the conditions for Aboriginal and Torres Strait Islander peoples from the Land Rights Movement of 1967 to the Voice to Parliament Referendum of 2023. This research is proposed through the analysis of key federal legislations from both parties, including the Land Rights Movement, the establishment and abolition of ATSIC, the Closing the Gap initiative, and the Voice to Parliament Referendum, to prove whether these legislations put into place by their respective party advanced the process of self-determination and recognition of Aboriginal and Torres Strait Islander peoples. Ultimately, this paper argues that the legislation of the ALP only function "on paper" and do not establish true change in the lives of Aboriginal and Torres Strait Islander peoples and concludes that neither party has attributed to the structural inequality and emphasizes the need for genuine cooperation and self - determination of the Aboriginal and Torres Strait Islander peoples

Faculty Mentor: Alexandru Balas, International Studies

Student Presenter:

Megan Marsala, Senior, International Studies

Why Is the Humanitarian Crisis in Sudan Receiving Less Global Media Attention Compared to Other Conflicts?

This presentation explores the reasons as to why there is instability and war in Sudan, as well as why this war does not get as much attention as other humanitarian crises currently going on in the world. This crisis officially began in April 2023; the origins of the issues can be traced back to 2019. The two main actors in this conflict are the RSF (Rapid Support Forces) and the SAF (Special Armed Forces). Issues began because of the already corrupt government in Sudan, and now civilians are facing the repercussions. Sudan has the highest number of displacements and famines, while receiving an

extreme lack of aid, and as mentioned before, there are many fewer reports on the war in Sudan in comparison to other issues. The reasons for these fewer reports being that there is much more risk, a lack of familiarity from a western perspective, a lack of financial gain from world leaders, and because of racial bias.

Faculty Mentor: Alexandru Balas, International Studies

Student Presenter:

Fernanda Fernandez, Sophomore, International Studies

Session: 2

12:40-1:40 - Bowers 1208

Art Process as Practice: The Journey Behind the Work

Faculty Moderator: Martine Barnaby, Art Studio

One-Way Constellation

An in-progress look at an animated short film, with a duration of 5-8 minutes, is a 2D hand-drawn project created frame by frame in Adobe Animate at 24 fps, with backgrounds developed in Procreate and visual effects produced in Adobe After Effects. Inspired by anime aesthetics, the film serves as an exploration of technical skill, experimentation, visual storytelling, and a deeper understanding of the animation process. It follows 13-year-old Pandora as she salvages a crashed plane deep in the forest, transforming it into a makeshift spaceship in a fragile attempt to escape the harshness of war alongside her friend Calypso. Through this journey, she begins to understand the weight of dreams and that not everything that goes away is meant to return.

Faculty Mentor: Martine Barnaby, Art Studio

Student Presenter:

Josefina Jiménez García, Senior

To Give Your Heart

To Give Your Heart is a 2D hand-drawn animated short film, 3-6 minutes in duration, produced frame by frame in Adobe Fresco at 24 fps. Drawing on Japanese anime visuals, the project investigates technical proficiency, formal experimentation, and visual storytelling while developing a comprehensive understanding of the animation process. The story follows a man's transition from routine daily life to the emotional aftermath of a breakup. The film examines themes of emotional vulnerability, attachment, and self-sacrifice. In animated form, the short emphasizes visual metaphor and expressive motion.

Faculty Mentor: Martine Barnaby, Art Studio

Student Presenter:

Simeon Parks, Senior, Art Studio

A Brief History of Paper Dolls and their Use as an Art Form

Since the invention of paper, paper dolls have been used as an art form because they are inexpensive to make and accessible to people of all socioeconomic classes. This presentation will be in-progress body of work based on my research on paper dolls as an art form throughout history and in the modern day. From being used in rituals in China and Japan, to being a tool to idealize the middle- and upper-class life for young children in the 19th and 20th centuries, to being a tool to instruct students in the modern day. My research will examine how paper dolls can be used today as an interactive art form through my own articulated paper doll project, as well as how they were used around the world.

Faculty Mentor: Martine Barnaby, Art Studio

Student Presenter:

Keightlen Eaton, Senior, Art Studio

Session: 3

3:00-4:00 – Bowers 1120

Reading in Cortland: Past, Present, Future

Faculty Moderator: Abigail Droge, English

Reading in Cortland: Past, Present, Future

Students from English 429 will discuss the work that they have undertaken in Spring 2026. As a class, we have worked with Memorial Library and the Cortland County Historical Society to conduct archival research on how past generations of readers in Cortland have engaged with literature. This research has then inspired us to build our own literary society and create our own class archive, in conversation with historical examples.

Faculty Mentor: Abigail Droge, English

Student Presenters:

Cortlyn Atwood, Junior, International Studies

Nuo Chen, Freshman

William Snyder, Senior, Chemistry

Kristina Zolnier, Senior, Adolescence Education in English

Grace Kang, Junior, English

Leah Hanlon, Junior, Adolescence Education in English

Natalia D'Onofrio, Senior, English

Session: 3

3:00-4:00 – Bowers 1208

Showcasing Student Research in Anthropology

Faculty Moderator: Hollis Miller, Anthropology

Did Exposure to Toxic Substances Contribute to Higher Incidences of Dental Ectopia in Past Populations?

Dental ectopia is an anomalous trait that describes tooth development or eruption outside of an individual's dental arcade. The etiology of this trait is unknown. Cases of the trait have been identified within samples of skeletal remains from an archaeological population at Nuvakwewtaqa (Chavez Pass, AZ). Research suggests this community may have been exposed to materials we know today to be toxic in certain quantities. This project investigated whether any correlation may exist between the environment or lifeways of past peoples and the development of ectopic teeth by analyzing data trends compiled from an archaeological literature review. Results were inconclusive due to small and limited study samples. There is need for further investigation into the causation of ectopic teeth and how toxins may relate to this developmental anomaly. Future research may involve a comparative analysis of related clinical literature. This project also revealed problematic terminology and suggestions for interdisciplinary standardization.

Faculty Mentor: Kent Johnson, Anthropology

Student Presenter:

Anjuli Latchmansingh, Senior, Archaeology

Repatriation Recontextualized: Heritage, Symbolism, and Foreign Diplomacy

Heritage politics are often confined to cultural studies, which perhaps contributes to the relatively recent establishment of heritage diplomacy as an academic field. As a result of its recent establishment, heritage diplomacy scholars do not hail from a singular academic discipline. This allows a myriad of specializations and research topics that range from cultural studies to business to chemistry. A multidisciplinary approach has many benefits, but such an approach also contains extreme limitations: many important aspects of heritage diplomacy often go overlooked or are completely omitted. Meanwhile, the field itself remains critically under-researched. In an attempt to address one of those gaps in heritage diplomacy literature, this paper recontextualizes repatriation - the act of returning heritage to its country of origin - as a tool of heritage diplomacy, emphasizing the importance of repatriation's diplomatic symbolism as much as the physical act of restitution.

Faculty Mentor: Sharon Steadman, Anthropology, Hollis Miller, Anthropology

Student Presenter:

Emma Caraher, Senior, Anthropology

Walking in the Lands Between: A Comprehension of Identity between Egypt and Nubia in the 25th Dynasty

The study of identity within archaeology is one of great difficulty and importance. Today, this study shapes our narratives and understandings of the past, focusing on individualism and memory rather

than biased interpretations. Identity is a constantly shifting paradigm; our modern biases are not always reflective of societies in the past, creating problematic interpretations that do not accurately reflect past cultures. Past identity expressions are often lost to history; archaeologists must infer how past societies presented themselves in death. Current scholarship argues for a variety of identities, creating conflict between scholars. This presentation will examine our understanding of communal and ethnic identity in the territories of Upper Egypt and Lower Nubia, regarding the Cataracts Region of the Nile. Utilizing prior scholarly work to frame our contemporary concept of identities, what evidence can be used to prove that a shared and fluid identity in ancient Egypt/Nubia existed?

Faculty Mentor: Sharon Steadman, Anthropology, Hollis Miller, Anthropology

Student Presenter:

Ryan Wheeler, Junior, Archaeology

Using faunal analysis to examine colonial period diet on the Kodiak Archipelago, Alaska

In the SUNY Cortland Archaeology Lab, we examine materials recovered from the Kodiak Archipelago, Alaska that date from the late precolonial and early Russian colonial periods. Our primary focus has been on animal bones and shells (i.e. faunal remains) that were recovered from the Ing'yuq Village archaeological site, an ancestral Sugpiaq winter village. Our work as interns includes sorting bags of bulk faunal remains into taxonomic categories such as mammal, bird, fish, and invertebrate. We then work with reference collections to identify mammalian species. We are analyzing these materials to understand how Sugpiaq ancestors may have changed their diets and harvesting practices in response to forced labor regimes, disease, and relocation during the Russian colonial period. Initial findings indicate that Sugpiaq ancestors faced some nutritional hardship but maintained their relationships to the land by continuing to harvest traditional foods.

Faculty Mentor: Hollis Miller, Anthropology

Student Presenters:

Matthew Solan, Junior, Archaeology

Anna Tanzman, Junior, Archaeology

Session: 3

3:00-4:00 - Bowers 1214

Flower Evolution in Nicotiana Polyploids

Faculty Moderator: Elizabeth McCarthy, Biology

Investigating progenitor homeolog bias in anthocyanin producing genes of Nicotiana quadrivalvis and N. clevelandii allopolyploids

Polyploids are organisms with two or more sets of chromosomes, inheriting multiple gene copies from each parent. Allopolyploids are polyploids formed through hybridization. In allopolyploids, expression of one progenitor's gene copies may be favored, a concept known as homeolog bias. Hybridization increases genetic diversity and generates phenotypic variation, including changes in

floral coloration. Flower color influences pollinator attraction because pollinators perceive colors differently, affecting reproductive success. Floral pigmentation is produced through the flavonoid biosynthetic pathway, where enzymes sequentially synthesize anthocyanins. We used droplet digital PCR to quantify expression of anthocyanin gene homeologs in *Nicotiana quadrivalvis* and *N. clevelandii* allopolyploids. These species arose ~1 million years ago from hybridization between diploids *N. obtusifolia* and *N. attenuata*. Results show that *N. clevelandii* favors the *N. attenuata* homeolog in *F3'5'H*, *DFR*, and *ANS*, with roughly equal *AN1* expression as expected because *N. clevelandii* and *N. attenuata* have anthocyanins while *N. obtusifolia* does not.

Faculty Mentor: Elizabeth McCarthy, Biology

Student Presenter:

Brooke Tillotson, Senior, Biology

Determining the homeolog bias for flavonol gene production within Nicotiana section Polydicliae allopolyploids using droplet digital PCR

Pigment production by plants plays a crucial role in their reproduction. Flavonol pigments, which absorb UV, are visualized by some pollinators. I'm investigating the genetic basis of flavonol production within the polyploid genus *Nicotiana*. Polyploidy is when an organism has multiple sets of chromosomes. *Nicotiana obtusifolia* and *N. attenuata* are diploids that hybridized, producing the allopolyploids *N. clevelandii* and *N. quadrivalvis* in *Nicotiana* section *Polydicliae*. We expect a homeolog bias, which is when the polyploid shows unequal expression levels between progenitor copies. We expect bias towards *N. attenuata* in *N. clevelandii* since they produce anthocyanins. Conversely, we expect bias towards *N. obtusifolia* in *N. quadrivalvis* since they lack anthocyanins. Using droplet digital PCR, we quantified expression to determine homeolog bias, using primers that distinguish between progenitor copies. Results show that *N. clevelandii* has bias towards *N. obtusifolia* and towards *N. attenuata* for different genes. We'll continue testing with *N. quadrivalvis*.

Faculty Mentor: Elizabeth McCarthy, Biology

Student Presenter:

Alyssa Perrino, Senior, Biology

Investigating cellular dynamic changes in the flowers of Nicotiana polyploids across evolutionary history

Polyploidy is a phenomenon in which an organism has more than two sets of chromosomes. At the cellular and organismal level, polyploid plants tend to be larger than their diploid counterparts because cells must be larger to fit more genetic material. In our previous work, we found that older polyploid species had smaller cells which were similar to that of a diploid plant. To investigate this phenomenon and determine when cell size reduction takes place, we took three *Nicotiana* polyploids of different evolutionary ages, including first generation, one million years old, and four million years old, and measured the length, width, and number of cells in a file in their floral tubes at 20% and 100% of mature flower length. From these data, we conclude that cell size shrinkage in *Nicotiana* is apparent after ~1 million years of polyploid evolution and that this shrinkage takes place before genome size shrinkage.

Faculty Mentor: ElizabethMcCarthy, Biology

Student Presenter:

Timothy McGrath, Senior, Biology

INDIVIDUAL PRESENTATIONS

Session: 1

10:20-11:20 - Bowers 1119

Faculty Moderator: Laura Eirman, Biology

Banzai! The Manufacture of Consent and its Effects on the War in the Pacific

This presentation analyzes the manufacture of consent during the Pacific War, drawing Edward Bernays and Walter Lippmann. With a focus on the Greater East Asia Co-Prosperity Sphere (GEACPS), this presentation studies how Japanese propaganda attempted to rally anti-colonial grievances toward its own imperial project.

Faculty Mentor: Mason Kim, Political Science

Student Presenter:

Drake Howard, Senior, Political Science

Session: 1

10:20-11:20 – Bowers 1119

Faculty Moderator: Laura Eierman

Conservative Protest and the Cortland Student: How SUNY Cortland Redefines our Understanding of National Student Activism in the 1960-1970 Period.

My project examines how student activism movements at SUNY Cortland in the 1960s and 1970s redefined our understanding of student voice and protest. Focusing on the ten-year period from 1960 to 1970 (often heralded as the heyday of civil rights activism), I analyzed archival documents, campus publications, student theses, oral histories, and conducted interviews to understand how Cortland students understood their role and voice at the time. Culminating in a thesis-length research paper, my research contrasts these student movements with the broader narrative of student activism, signifying how Cortland's history both paralleled and redefined the national protest culture. Cortland's history, though largely obscure to the national stage, serves not only as a cornerstone to students' lives today, but provides broader implications for student participation and voice in a time of such widespread apprehension and concern.

Faculty Mentor: Kevin Sheets, History

Student Presenter:

Dahlia Spilka, Senior, History

Session: 1

10:20-11:20 - Bowers 1119

Faculty Moderator: Laura Eierman, Biology

Application of environmental DNA (eDNA) techniques to assess *Diadema antillarum* abundance on Belizean coral reefs

Coral reefs are among the most diverse ecosystems and have experienced significant declines, particularly in the Caribbean. This deterioration, driven by mass bleaching, disease, and overfishing, has shifted reefs toward macroalgal dominance and was exacerbated by the 1983 mass mortality of *Diadema antillarum*, a keystone herbivorous species crucial for algal control. Although populations have shown limited, patchy recovery, monitoring remains challenging due to the Caribbean's large spatial scale and the species' nocturnal habits. This study assesses the abundance and distribution of *D. antillarum* and other species along the Mesoamerican Barrier Reef in Belize using environmental DNA (eDNA). Water samples and visual surveys were conducted along 100 m transects with 1 m² quadrats every 20 m, and 1 L water samples collected at each quadrat. A cytochrome oxidase gene region was amplified with species-specific primers and quantified via qPCR. Results showed a positive correlation between eDNA and visual density estimates, supporting eDNA as a reliable monitoring tool.

Faculty Mentor: Laura Eierman, Biology

Student Presenter:

Nicolette Carluccio, Senior, Conservation Biology

Session: 1

10:20-11:20 - Bowers 1119

Faculty Moderator: Laura Eierman, Biology

Spatial and Temporal Distribution of Invasive Jumping Worms is Associated to Human Activity at Taughannock State Park

Invasive jumping worms have been spreading across North America for over a century. They disrupt soil composition and nutrient availability, negatively impacting biota in invaded habitats. Humans often transport worms in soil, often inadvertently in shoes, tools, and tires. The purpose of this study was to document shifts in jumping worm abundance at Taughannock State Park over 5 years and to identify the relationship between the abundance of jumping worms to high human traffic areas. We sampled worms at 100 randomly selected locations in 2019 and 2024. Each worm was identified to species using genetic differences in the COI gene. Early analysis suggests that there is an inverse relation between the distance from high traffic areas, and the abundance of invasive jumping worms in both years. Additionally, jumping worms were found at 20 sites in both years, an additional 9 sites only in 2019, and 13 new sites in 2024.

Faculty Mentor: Laura Eierman, Biology, Andrea Davalos, Biology

Student Presenter:

Catherine Crowley, Senior, Biology

Session: 2

12:40-1:40 - Bowers 1129

Faculty Moderator: Kevin Dames, Exercise Science

Menstrual Cycle Phase Found to Influence Passive Joint Flexibility and Time to Stabilization Measures

The hormonal fluctuations occurring during the female menstrual cycle have been linked with ligamentous injury risk. We investigated joint laxity and dynamic postural control during menses and prior to ovulation, where relaxin levels are considered low and trend towards peak, respectively. Nine (to date) females not on hormonal birth control and with a regular menstrual cycle over the last 12 months participated. Each collection involved passive flexibility tests and single-leg (dominant) vertical drop landings onto a force plate. Findings suggest no changes in impact kinetics or postural sway post-landing. Hip/low-back flexibility was higher during menses while knee and ankle range of motion remained unchanged. Ankle dorsiflexion positively correlated with vertical time to stabilization. Further investigation is required to determine if elevated relaxin levels around ovulation contribute to increased non-contact ligament injury frequency. Our data suggests general joint laxity and neuromuscular control during landing tasks are generally homeostatic in nature.

Faculty Mentor: Kevin Dames, Exercise Science

Student Presenter:

Olivia Matrulli, Senior, Exercise Science

Session: 2

12:40-1:40 - Bowers 1129

Faculty Moderator: Kevin Dames, Exercise Science

How TESOL Students in Brazil and the U.S. Encode Motion: Manner and Path in English

Space is essential for examining how language encodes human experience and how motion is conceptualized and expressed. Languages are different in how they encode elements such as Manner and Path. This can influence how speakers describe events, develop second language proficiency and teach second language. My project investigates how TESOL majors conceptualize and describe motion events in English. To do so, I collect data from TESOL majors at SUNY Cortland and IFMG (Brazil). Participants will watch short video clips from a video game depicting motion events and provide oral descriptions. These responses will be decoded and analyzed for patterns in Manner and Path expression. In this presentation, I will introduce the fundamentals in spatial semantics and share preliminary findings that will help us understand how multilingual learners

encode motion. This research will improve our understanding of language development and informing classroom practices.

Faculty Mentor: Jean Costa-Silva, Teaching English as a Second Language

Student Presenter:

Roberto Crisóstomo Suarez, Junior, Teaching English as a Second Language

Session: 2

12:40-1:40 - Bowers 1129

Faculty Moderator: Kevin Dames, Exercise Science

Generating Transposon Mutants of Legionella micdadei to Study Biofilm Formation

Legionella micdadei (Lmic) is a strain of bacteria that causes around 5% of Legionella human infections and is likely transmitted through aerosols from contaminated man-made water systems. In a previous study, Lmic was able to persist in biofilms of the system, which could be how it spreads to humans. There is currently a lack of genetic information on biofilm growth of Lmic. We will find mutants that are randomly mutated by transposons to lack a surface component that absorbs Congo Red dye. Once we find mutants that are deficient in Congo Red staining, we will test them for meaningful phenotypes, like loss of biofilm growth. We hypothesize if mutants have a growth defect on Congo Red, they will have interesting biofilm capabilities. We are continuing to screen about 100 colonies per semester as we hope to isolate up to five mutants that have unique phenotypes to send for sequencing.

Faculty Mentor: Christa Chatfield, Biology

Student Presenter:

Morgan Raymond, Senior, Biology

POSTER PRESENTATIONS

Poster Session: A

11:30-12:30 - Bowers Lobby

A1: The effect of a cool-down versus passive recovery on autonomic modulation after vigorous exercise.

PURPOSE: The purpose of this project was to compare changes in autonomic modulation, with and without a cool-down, after high intensity interval exercise. METHODS: Thirteen moderately active individuals (age 22±1yr) were assessed for autonomic modulation at Rest, and 20, 45, and 60

minutes after high intensity interval exercise. The natural log of the root mean square of successive differences between normal heartbeats (lnRMSSD) is a linear measure of vagal modulation in the time domain and was used to assess autonomic recovery. **RESULTS:** Results showed decreases in lnRMSSD at 20 min compared to rest without a cool-down, with recovery by 45 min after exercise. There were no differences in lnRMSSD from rest to post exercise with the use of a cool-down. **CONCLUSION:** These data suggest that prescribing a cool-down after vigorous exercise may result in faster recovery of the autonomic nervous system.

Faculty Mentor: Jason Parks, Exercise Science

Student Presenter:

Madigan Baxter, Sophomore, Exercise Science

Co-researchers:

Nathan Bearup, Senior, Exercise Science

Victoria Cave, Junior, Exercise Science

Samirah Rosario, Junior, Exercise Science

Joleen Lusk, Sophomore, Exercise Science

Mia Ponzo, Junior, Exercise Science

A2: The effect of a cool-down versus passive recovery on heart rate complexity after vigorous exercise

PURPOSE: The purpose of this study was to evaluate changes in heart rate complexity (HRC) following a single bout of high-intensity exercise performed with and without a cool-down protocol. **METHODS:** HRC was measured in thirteen moderately active individuals (age 22±1yr) at Rest, and 20, 45, and 60 minutes post-exercise. Both a cool-down and passive recovery condition were implemented immediately after exercise for each participant. Sample entropy (SampEn), a non-linear measure of vagal modulation, was used to examine the complexity of the R-R intervals over a 5-minute period. The R-R intervals are the time measurements between heart beats. SampEn is the probability of similar sequences over a short period of time. **RESULTS:** There were no significant changes in SampEn for either condition after vigorous exercise. **CONCLUSION:** These data suggest that the prescribed high-intensity exercise protocol did not disrupt autonomic function post exercise.

Faculty Mentor: Jason Parks, Exercise Science

Student Presenter:

Nathan Bearup, Senior, Exercise Science

Co-researchers:

Victoria Cave, Junior, Exercise Science

Madigan Baxter, Sophomore, Exercise Science

Samirah Rosario, Junior, Exercise Science

Joleen Lusk, Sophomore, Exercise Science

Mia Ponzo, Junior, Exercise Science

A3: The effect of a cool-down versus passive recovery on vagal modulation after vigorous exercise

PURPOSE: The purpose of this project was to investigate changes in vagal modulation after a cool-down compared to passive recovery. **METHODS:** Thirteen moderately active individuals (age 22±1yr) were assessed for vagal modulation at Rest, and 20, 45, and 60 minutes after vigorous exercise. Each participant performed separate cool-down and passive recovery protocols following vigorous exercise. The natural log of high frequency power (lnHF) is a linear measure of heart rate variability and represents vagal modulation in the frequency domain. Vagal modulation represents the parasympathetic branch of the autonomic nervous system. **RESULTS:** There was a significant decrease in lnHF at 20 min compared to rest during passive recovery and no change using a cool-down. **CONCLUSIONS:** These findings suggest vagal withdrawal for at least 20 min during passive recovery. In addition, the use of a cool down after vigorous exercise may speed recovery of the autonomic nervous system after vigorous exercise.

Faculty Mentor: Jason Parks, Exercise Science

Student Presenter:

Victoria Cave, Junior, Exercise Science

Co-researchers:

Nathan Bearup, Senior, Exercise Science

Madigan Baxter, Sophomore, Exercise Science

Samirah Rosario, Junior, Exercise Science

Joleen Lusk, Sophomore, Exercise Science

Mia Ponzo, Junior, Exercise Science

A4: Comparison of a cool-down and passive recovery on autonomic modulation after vigorous exercise

PURPOSE: The purpose of this study was to compare the effects of a cool-down versus passive recovery on autonomic modulation following vigorous exercise. **METHODS:** Thirteen moderately active individuals (age 22±1yr) were assessed for autonomic modulation at Rest, 20, 45, and 60 minutes after completing vigorous exercise following cool-down and passive recovery conditions. The dependent variable analyzed was the natural log of total power (lnTP), representing overall autonomic activity. **RESULTS:** Results showed no difference in lnTP post exercise after a cool-down. During passive recovery, lnTP decreased at 20 min post exercise compared to rest with recovery at 45 min. **CONCLUSION:** These findings suggest that an active cool-down may facilitate a more stable recovery of the autonomic nervous system following vigorous exercise compared to passive recovery. These findings highlight the potential benefit of incorporating a cool-down strategy to enhance post-exercise recovery.

Faculty Mentor: Jason Parks, Exercise Science

Student Presenter:

Mia Ponzo, Sophomore, Exercise Science

Co-researchers:

Victoria Cave, Junior, Exercise Science

Nathan Bearup, Senior, Exercise Science

Madigan Baxter, Sophomore, Exercise Science

Samira Rosario, Junior, Exercise Science
Joleen Lusk, Junior, Exercise Science

A5: Comparison of a cool-down and passive recovery on sympathovagal dominance after vigorous exercise

Purpose: The purpose of this study was to compare a cool-down versus passive recovery after 90 seconds of high intensity interval exercise. Methods: Thirteen moderately active individuals (age 22 ± 1 yr) were assessed for autonomic modulation at Rest, and 20, 45 and 60 minutes following high intensity interval exercise. Results: The ratio of low frequency to high frequency power (LF/HF ratio) is a measure of sympathovagal dominance and was used to assess autonomic recovery. Results show an increase in the LF/HF ratio at 20 minutes post exercise, compared to rest in the passive recovery condition with recovery of the LF/HF ratio within 45 minutes after exercise, with no changes in LF/HF ratio during the cool-down condition. Conclusion: The increase in LF/HF ratio suggests sympathetic dominance for at least 20 minutes with the passive recovery protocol alone and faster recovery of the autonomic nervous system when using a cool-down.

Faculty Mentor: Jason Parks, Exercise Science

Student Presenter:

Samirah Rosario, Junior, Exercise Science

Co-researchers:

Nathan Bearup, Junior, Exercise Science

Victoria Cave, Junior, Fitness Development

Mia Ponzo, Junior, Exercise Science

Joleen Lusk, Junior, Exercise Science

Madigan Baxter, Junior, Exercise Science

A6: Comparison of a cool-down and passive recovery on heart rate complexity after vigorous exercise

PURPOSE: The purpose of this study was to compare the effects of a cool-down and passive recovery on heart rate complexity (HRC) after vigorous exercise. METHODS: HRC was measured in thirteen moderately active individuals (age 22 ± 1 yr) at rest, and 20, 45, and 60 minutes after vigorous exercise. Approximate entropy (ApEn), a non-linear measure of vagal modulation, was used to examine the complexity of the R-R intervals over a 5- minute period. The R-R intervals are the time measurements between heart beats. ApEn is the probability of similar sequences or successive matches over a short period of time. RESULTS: There were no differences in ApEn at 20, 45, and 60 minutes compared to rest, after vigorous exercise. CONCLUSION: These data suggest no change in HRC after high intensity interval training.

Faculty Mentor: Jason Parks, Exercise Science

Student Presenter:

Joleen Lusk, Senior, Exercise Science

Co-researchers:

Mia Ponzo, Junior, Exercise Science

Victoria Cave, Junior, Exercise Science

Nathan Bearup, Senior, Exercise Science

Madigan Baxter, Junior, Exercise Science
Samira Rosario, Junior, Exercise Science

A7: Effects of abomasal sulforaphane infusion on metabolism and lactation in dairy cows

In lactating dairy cows, skeletal muscle insulin resistance occurs to spare nutrients to the mammary gland for milk synthesis. To determine if the sphingolipid ceramide drives this process, we blocked the de novo ceramide synthesis pathway using sulforaphane (SFN), an isolate from cruciferous vegetables. Seven mid- to late-lactation cows were studied in a crossover design with two 14-day periods and a 7-day washout. Cows received daily abomasal administration of either 1) SFN (0.025 mg/kg BW/d) + bovine serum albumin (BSA; 5%) in water or 2) 5% BSA in water (control). SFN had no effect on dry matter intake, indicating no adverse effects. Milk yield, daily plasma glucose and fatty acids, and insulin sensitivity were unaffected by SFN. Ceramide analysis is in progress. The absence of treatment effects may be attributable to the dose or route of administration used. Future research is needed to explore these possibilities.

Faculty Mentor: Amanda Davis, Biology, Joseph McFadden, Cornell

Student Presenter:

Jared Simmons, Senior, Biomedical Sciences

Anthony Santiago, Sophomore, Biomedical Sciences

A8: Cell Line Discrimination Using Electric Cell-Substrate Impedance Sensing

Cross-contamination and misidentification in cell culture pose major challenges to research reproducibility. Available genetic authentication methods are costly and have slow turnaround times, which limit their routine use. This study evaluates Electric Cell-substrate Impedance Sensing (ECIS) as a rapid, cost-effective method to distinguish cell lines based on biophysical signatures. We examined the parental HeLa cell line and two variants, HeLa 229 and HeLa Chang, representing a "worst-case scenario" due to shared genetic ancestry. Using electrode arrays, impedance was measured to assess cell attachment, proliferation, and barrier integrity. Cells were cultured to a stable confluent monolayer before a controlled electrical wound was introduced. As expected, wounding caused an immediate impedance drop, indicating loss of barrier function. Real-time recovery was then monitored as cells migrated and proliferated. Despite shared origins, the cell lines exhibited different impedance profiles and recovery kinetics, suggesting ECIS can serve as an automated tool for cell line discrimination.

Faculty Mentor: Theresa Curtis, Biomedical Sciences

Student Presenter:

Shreya Dhital, Junior, Biomedical Sciences

A9: Examining Random Mutants of Lmic growth rate to study genes that regulates biofilm formation

Legionella bacteria is responsible for Legionnaire's disease, which are severe types of pneumonia. These microbes grow in man-made water systems such as showers, vents, etc... People are typically

infected when they breathe in small droplets of water contaminated with Legionella bacteria from biofilms. Legionella biofilms are held together by amyloid fibers composed of proteins, crucial for structural stability and biofilm formation. In our current research we have generated a mutant with possible changes in phenotype observed during Congo Red staining. Loss of Congo Red staining might mean reduced amyloid production. Before we confirm biofilm alteration, we want to examine other factors that may affect phenotype changes. Growth rate of a mutant were examined for 24h and compared with a wild type. The wild type reached 95% of maximum growth earlier than the mutant. Overall, the mutant did not grow as fast and as much as the wild type.

Faculty Mentor: Christa Chatfield, Biomedical Sciences

Student Presenter:

Mamadou Diallo, Senior, Biomedical Sciences

A10: Quantifying the composition of an Adirondack biotite-quartzite for well water quality, Camp Huntington, Raquette Lake, NY

Remote regions isolated from municipal water resources, such as much of the Adirondack Park in New York State, often rely on groundwater as a source of drinking water. The mineralogy of bedrock influences groundwater geochemistry, making it essential to research and quantify for human health in rural communities. To examine bedrock mineralogy, drill cuttings from two 600-foot depth water wells installed on Pine Knot Point of Raquette Lake were divided by depth interval, rinsed of fines, and dried in an oven prior to observation. Mineral content by volume was visually estimated for each sample using a stereoscopic microscope. Various testing methods were used for mineral identification, such as magnetism, hardness, and reaction with hydrochloric acid (HCl). The primary rock type is biotite quartzite, with smaller abundances of diopside and calcite. Quartz dominates the bedrock, comprising 45-82% of overall composition. Compositional analysis using scanning electron microscopy (SEM) yields phlogopite components of 49-86%. Following visual discovery in the bottom of well 1 (Unit 1.8, 540-560ft), muscovite was confirmed via SEM and found in small proportions ($\leq 1\%$ vol) throughout both wells. Muscovite's presence in this geologic setting is evidence of secondary hydrothermal activity, given the instability of metamorphic muscovite in rocks of the Adirondack Highlands. With regards to water quality, the dominance of quartz indicates low cation contribution, while calcite buffers pH.

Faculty Mentor: Robert Darling, Geology

Student Presenter:

Aspen Eden, Senior, Environmental Geoscience

A11: Analysis of a Soil Monolith from Hoxie Gorge

Background and Methods: Soil monoliths are essential tools for visualizing the structure and composition of an undisturbed soil ecosystem. We present an analysis of a newly constructed soil monolith that depicts the soil ecosystem of a grass meadow in Hoxie Gorge, Cortland, New York. We determined the physicochemical properties of the soil horizons in the profile from samples collected during the extraction of the monolith. Results and Conclusions: The monolith shows a clear separation between the dark, organic-rich horizon on top and the clay-rich horizons toward the bottom. In the field, the soil was wetter at depth than at the surface. This is reflected in the monolith, with the greyer-colored soil in the deeper horizons. The Hoxie Gorge monolith effectively illustrates

the different soil horizons and their structure and composition, making it a useful tool for soil identification and agricultural education in the region.

Faculty Mentor: Jesse Bloom Bateman, Biology

Student Presenter:

Jonathan Hall, Sophomore, Biology

A12: Examining the Alternate-Forms Reliability of a Sentence Writing Measure

Proficiency in sentence construction correlates with writing quality (Graham et al., 2012), yet the psychometric properties of sentence construction measures require further examination. This study examined the alternate-forms reliability of a sentence construction measure to determine if its forms are equivalent for future use in screening and progress monitoring. To do this, we sampled elementary students from nine classrooms to complete the forms in a counterbalanced order. Based on prior research demonstrating moderate alternate-forms reliability in curriculum-based measures of writing, including picture-word and story prompt curriculum-based measures (Allen et al., 2022), we hypothesized that there would be a moderate correlation between students' scores across numerous probes.

Faculty Mentor: Bridget Hier, Psychology

Student Presenter:

Samantha Hamel, Senior, Psychology

Shannon Coyle, Senior, Psychology

Anna-Marie Nash, Senior, Psychology

Giulia O'Connell, Senior, Psychology

A13: An independent study examining the validity of curriculum-based writing measures.

Screening measures may provide educators with the opportunity to identify students in need of greater support. Despite the importance of valid screening measures, a meta-analysis revealed that few studies have examined the criterion validity of sentence writing measures (Romig et al., 2017). The purpose of this study was to examine the criterion validity of a measure of children's sentence writing. Participants were first- through fourth-grade students from 9 elementary classrooms. Data were collected across six 30-minute sessions over two weeks. Participants completed a curriculum-based measure of sentence construction (CBM-SC) and a criterion writing measure from the Wechsler Individual Achievement Test-Fourth Edition (WIAT-4). Because curriculum-based writing measures evidence moderate levels of validity with standardized, norm-referenced criterion measures in a meta-analysis ($r = .54$; Romig et al. 2017), we hypothesized that the correlation between CBM-SC and the WIAT-4 would be positive and of moderate strength.

Faculty Mentor: Bridget Hier, Psychology

Student Presenter:

Joy Mydlenski, Senior, Psychology

Sarah Dixon, Senior, Psychology

Jamaal Boyce, Senior, Psychology; Grace Iovinella, Junior, Psychology

A14: Photochemistry of Sucralose

This research aims to understand the behavior of the artificial sweetener sucralose in the natural environment, focusing on its rate of degradation and the formation of byproducts. Sucralose is widely used as a sugar substitute and is resistant to natural degradation processes such as sunlight exposure and water treatment. This environmental contaminant raises concerns due to its potential accumulation in the environment and possible effects on human health and aquatic organisms. To measure light intensity, an actinometer method was developed for use in sucralose experiments. The actinometer samples were extracted using solid-phase extraction and analyzed using mass spectrometry due to their low ionization efficiency.

Faculty Mentor: Jeffrey Werner, Chemistry

Student Presenter:

Minju Kim, Junior, Chemistry

A15: Comparison of Vertical Oscillation During Treadmill Exercise on a Lower Body Positive Pressure and Standard Treadmill

It is unclear whether vertical oscillation changes to the decreased body weight in lower body positive pressure treadmills (LBPPT). The purpose of this study was to examine the differences in vertical oscillation (cm) between LBPPT and a standard treadmill (ST) while running. Vertical oscillation was calculated using a Stryd power meter attached to the runner's right shoe. A pilot study of 6 college aged participants (20.83 ± 0.98 years) completed a protocol consisting of three consecutive stages at three minutes each at 134.0 m/min, 160.8 m/min, and 187.6 m/min on a standard treadmill (ST) and at 80% of total body weight on a LBPPT. Average (\pm SD) for vertical oscillation at the walking and three increasing running speeds on LBPPT were: 11.14 ± 1.29 , 6.93 ± 1.63 , 7.99 ± 1.68 , 8.44 ± 1.6 , respectively, and ST were: 10.94 ± 1.78 , 6.93 ± 1.89 , 7.93 ± 1.61 , 8.60 ± 1.22 , respectively. The pilot study did not measure a significant difference in vertical oscillation on a LBPPT compared to ST.

Faculty Mentor: James Hokanson, Exercise Science; Erik Lind, Exercise Science

Student Presenter:

Alexandra Mackenzie, Junior, Exercise Science

Ben Wasser, Sophomore, Exercise Science

Raymond Meng, Junior, Exercise Science

A16: Running Variables, Physiological and Perceptual Responses: Taking it all in Stryd

Form power is a running metric that combines absolute power with vertical oscillation and cadence. Greater form power has been correlated to increased rate of perceived exertion (RPE) and metabolic cost. The purpose of this study was to observe the relationship between form power, heart rate, running cadence and RPE. Fifteen healthy, college-aged participants (21.3 ± 1.4 years) performed the following treadmill protocol: 1 minute rest, 2 minutes of walking at 93.8 m/min, then three running stages of 3 mins at 134.0, 160.8, and 187.6 m/min, respectively. The Stryd power meter and a Garmin watch with a chest heart rate monitor recorded power, cadence, and HR continuously. RPE was measured every minute. The initial findings suggest that there's a positive correlation between form power and HR/RPE ($R^2 = 0.89$ and 0.85 respectively). A positive relationship between running cadence and absolute power was observed ($R^2 = 0.63$).

Faculty Mentor: James Hokanson, Exercise Science; Erik Lind, Exercise Science

Student Presenter:

Ben Wasser, Sophomore, Exercise Science

Raymond Meng, Junior, Exercise Science

Alexandra Mackenzie, Junior, Exercise Science

A17: Effects of intramural basketball on autonomic modulation in college aged individuals

Unobatsha Mbaiwa, Kevin D. Dames, Jared A. Rosenberg, and Jason C. Parks

PURPOSE: The purpose of this study was to examine changes in autonomic modulation from rest to recovery after an intramural basketball match in young healthy men. **METHODS:** Six male collegiate intramural basketball players (age 21±2) were assessed for autonomic modulation at rest, 20, 45, and 60 minutes post-match. The natural log of the root mean square of successive differences (lnRMSSD) between normal heartbeats, and high-frequency power (lnHF) were used to measure vagal modulation in the time and frequency domains, respectively. A repeated-measures ANOVA tested for time effects across the four measurement points. **RESULTS:** Both lnRMSSD and lnHF were significantly lower compared to rest for up to 45 min post-match, with recovery by 60 min. **CONCLUSION:** These findings indicate that a competitive intramural basketball match may result in vagal withdrawal for up to 45 min post exercise.

Faculty Mentor: Jason C. Parks, Exercise Science; Kevin D. Dames, Exercise Science; Jared A. Rosenberg, Exercise Science

Student Presenter:

Unobatsha Mbaiwa, Graduate Student, Exercise Science

A18: Relationships Between Self-Assessed Barriers to Exercise and Engagement in Resistance Training in 4,000+ People with Parkinson's Disease

Parkinson's disease (PD) is a progressive neurodegenerative disorder. It is well established that exercise leads to significant benefits. The purpose of the project was to determine the relationship between self-assessed barriers to exercise and engagement in resistance training in people with PD. A survey platform by the Michael J. Fox Foundation (FoxDEN) includes multiple-choice questions, "What did you do to exercise," and "Which of the following affects your participation in exercise activities." Surveys were completed by 4,449 participants, aged 68.6 ± 8.5 years. Chi-square tests compared presence of barriers with engagement in strength training and significance established at Bonferroni-corrected alpha of 0.0021. Individuals with barriers of low interest, low enjoyment and low perceived benefit of exercise were less likely to engage in resistance training. Clinicians may use this information to encourage resistance training by creating more engaging forms of exercise and by educating individuals on the benefits of resistance training.

Faculty Mentor: Lara Shigo, Exercise Science

Student Presenter:

Tyler Murphy, Junior, Exercise Science

Katherine Mahoney, Junior, Exercise Science

Zak Moumen, Junior, Exercise Science
Andreia Vasconcelos, Junior, Exercise Science

A19: Relationships Between Self-Assessed Barriers to Exercise and Moderate-to-Vigorous Intensity Aerobic Exercise in 4,000+ People with Parkinson's Disease

Parkinson's disease (PD) is a neurological disorder affecting movement. Exercise may improve symptoms and slow progression of PD. The purpose of this research was to assess relationships between personal barriers to exercise and participation in moderate- and vigorous-intensity aerobic exercise (MI; VI) in participants with PD. A survey conducted by the MJF Foundation assessing barriers and engagement in MI/VI was completed by 4,449 people with PD (68.6±8.5 years). Chi-square tests compared presence of barriers with engagement in MI/VI. Significance was established at Bonferroni-corrected alpha of 0.0021. Individuals with low interest and low enjoyment were less likely to engage in MI and VI. Individuals with limited perceived benefit and presence of physical health conditions were less likely to engage in VI. Individuals with limited time were more likely to engage in VI. Practitioners may modify exercise to increase enjoyment, clarify benefits of exercise, and adapt movements to increase engagement in MI/VI.

Faculty Mentor: Lara Shigo, Exercise Science

Student Presenter:

Viviana Pacurucu, Junior, Exercise Science
Xavier Rivera, Junior, Exercise Science
Lily Pranzo, Junior, Exercise Science
Liam Richman, Sophomore, Exercise Science

A20: Low Self-Concept Clarity and Negative Affectivity: Investigating the Mediation Role of Emotion Dysregulation

This study examined whether emotion dysregulation mediates the relationship between low self-concept clarity, the extent to which individuals understand their sense of self, and negative affectivity, a maladaptive personality trait characterized by emotional instability, anxiety, and depression. Participants were 197 undergraduate students who completed self-report measures of self-concept clarity, negative affectivity, and emotion dysregulation. Results indicated that lower self-concept clarity was associated with higher negative affectivity and greater emotion dysregulation, and that emotion dysregulation was positively related to negative affectivity. Mediation analysis revealed a significant indirect effect of self-concept clarity on negative affectivity through emotion dysregulation, indicating partial mediation. These findings suggest that emotion dysregulation may partially explain why an unclear and unstable sense of self is associated with a greater likelihood of experiencing negative emotions. Although causality cannot be inferred from our cross-sectional design, these findings improve our understanding of how these constructs are related.

Faculty Mentor: Alexandra Vizgaitis, Psychology

Student Presenter:

Sebastian Patino, Senior, Psychology

A21: College students may know more about sexual health than we think, but are they actually talking about it?

Approximately half of new STI cases each year affect college-aged individuals, putting them at increased STI risk. Health behavior theory and prior research support the importance of relevant and accurate knowledge in decreasing sexual risk behavior. This qualitative study sought to assess college students' sexual health (SH) knowledge through characterizing their conversations about SH. In pairs, college students engaged in recorded conversations about a SH vignette. Three rounds of coding included: 1) reviewing transcripts for SH content, 2) evaluating and reconciling statements for accuracy, and 3) categorizing them as true or false based on credible sources. Results indicated that college students' conversations were generally accurate. While only 42% of the sample referenced a SH fact, of those who did, 74% of statements were accurate. Findings highlight the potentially limited exchange of SH knowledge among college students and warrant further research on factors that influence their SH discussions.

Faculty Mentor: Katherine Bonafide, Psychology

Student Presenter:

Rhianna Philbrick, Senior, Psychology

Ella Campbell, Senior, Psychology

Jade Hornick, Junior, Psychology

A22: Promoting Children's Social Emotional Competencies Through Afterschool Programs Controlling For Pre-Intervention Differences.

Social emotional learning (SEL) plays an important role in child development. Afterschool programs that incorporate physical activity provide a promising context to promote SEL. However, few studies utilize pre-intervention data to evaluate SEL programs implemented through university-community partnerships. This study investigated the impact of an SEL-integrated afterschool program on children's behavioral outcomes over one semester, controlling for baseline differences. The program was implemented at four elementary schools by trained mentors and physical education students, with data collected via pre- and post-intervention surveys from children, parents, and instructors. A 2 (intervention vs. control) x 2 (pre vs. post) mixed ANOVA revealed no significant interaction effect. However, an independent samples t-test on gain scores between intervention and control groups showed an effect size of $d = .421$. This effect size exceeds typical findings in meta-analyses of SEL afterschool programs, suggesting the intervention is promising to improve behavioral outcomes.

Faculty Mentor: Xiaoye Xu, Psychology

Student Presenter:

Holly Pizzigati, Junior, Psychology

Silas Millas, Sophomore, Psychology

A23: Lidar and GIS Terrain Analyses of Subsidence related to Historic Salt Mining in Central New York

Syracuse, New York is known as the "Salt City," but where do they get all the salt they used in their industry from? While there's many locations, the ones that we are studying are in Tully Valley, New York. Specifically, we looked at the East Brine Field of the Tully Valley Mining Region. In this study, we collected LiDAR data which was used to create multiple bare earth raster files. DEMs derived from

the LiDAR data are used to conduct terrain analysis of the study area. These files are used in comparison to data from a previous 2009 USGS study to see how the land in the old halite mine locations have subsidized (dropped in elevation) and if more fracturing has occurred in the bedrock. We found 74 open fractures in the LiDAR data that could not be seen from aerial photographs or maps produced of the area by USGS. These findings are crucial because not only are bedrock fractures a safety concern, but we get to see a "natural experiment," meaning that we can see how historical human intervention on the land still affects the area today.

Faculty Mentor: Christopher Badurek, Geography

Student Presenter:

Haileigh Rhodes, Senior, Geology

A24: GIS-Based Trail Accessibility Assessment at Lime Hollow Nature Center

Outdoor recreation, such as hiking, is an important component of maintaining a healthy lifestyle, especially in regions such as Central New York where natural areas are abundant. Hiking trails provide opportunities for people to connect with the environment, making it important that individuals of all abilities can access and experience these spaces. However, many environmental and physical factors can influence the difficulty and accessibility of hiking trails. This study evaluates trail accessibility at Lime Hollow Nature Center in Cortland, New York using Geographic Information Systems (GIS) and field-based data collection. Field observations were collected along the Art Meadow Loop and Lehigh Valley Trail to document trail width, surface type, slope, and obstacles. These attributes were standardized into an accessibility index representing overall trail difficulty and analyzed using Kernel Density Estimation to identify clusters of accessibility challenges. The analysis highlights areas with more difficult trail conditions and indicates where accessibility may be improved.

Faculty Mentor: Christopher Badurek, Geography

Student Presenter:

Ashley Siergie, Senior, Geographic Information Systems

A25: Mechanochemical Synthesis of 2-Phenylbenzo[d]1,3,2-diazaborole from Phenylboronic Acid and O-Phenylenediamine

The mechanochemical synthesis of 2-phenylbenzo[d]1,3,2-diazaborole from phenylboronic acid and o-phenylenediamine was investigated to evaluate the influence of milling speed, base catalysis, and mechanical stability on reaction efficiency. Reactions were conducted under solvent-free conditions across a wide range of rotational speeds, both in the presence and absence of triethylamine, and product formation was assessed using thin-layer chromatography (TLC), infrared (IR) spectroscopy, and ^1H and ^{13}C nuclear magnetic resonance (NMR) spectroscopy. Low-energy milling without base addition resulted in minimal conversion, while intermediate milling speeds produced consistent evidence of heterocycle formation. The inclusion of triethylamine significantly improved reaction efficiency at moderate speeds, yielding the most spectroscopically consistent products. Excessively high milling speeds led to mechanical instability and heterogeneous reaction outcomes, limiting reproducibility despite increased nominal energy input. Overall, the results demonstrate that effective mechanochemical synthesis of diazaboroles requires careful balance

between chemical activation and mechanical parameters, with intermediate milling conditions and controlled base addition providing the most reliable pathway to product formation.

Faculty Mentor: Julius Green, Chemistry

Student Presenter:

Keolani Savage, Senior, Biomedical Sciences

A26: Structures of *S. h. jingganesis* L-DOPA Dioxygenase Provide Mechanistic Insights

Dioxygenases are a family of enzymes that perform a wide range of chemical reactions including oxidations, reductions, and cleavage all using molecular oxygen as a substrate. We have characterized an important enzyme from this family, L-DOPA dioxygenase from *Streptomyces hygroscopicus jingganesis*, obtained from our collaborators at Muhlenberg College. Here we describe our work on the structural characterization of a series of L-DOPA dioxygenase proteins. We have compared these structures to the structure of the protein homologue from *Streptomyces sclerotialus* (PDB ID: 6ON3). The current hypothesis is the relatively large active site of the *S. hygroscopicus jingganesis* allows for broader substrate specificity.

Faculty Mentor: Katherine Hicks, Chemistry

Student Presenter:

Darien DeFrancesco, Senior, Chemistry

A27: Characterization of a Short Chain Dehydrogenase Reductase from Burkholderia

There is a large protein family known as short-chain dehydrogenase reductases (SDRs), which are enzymes that catalyze the oxidation or reduction of various substrates. The Seattle Structural Genomics Center for Infectious Disease (SSGCID) provided the SDRs of interest utilized in the study. The enzymatic activity of a wild-type SDR 5TQV was measured along with two variants, D180L and D180N with various substrates using steady-state kinetic assays. This research aims to develop a biocatalytic toolkit, determine the role of specific amino acid residues in the SDR-catalyzed reaction, and establish a crystal structure with bound substrate.

Faculty Mentor: Katherine Hicks, Chemistry

Student Presenter:

Kellen Dickman, Senior, Biochemistry

Reese Chudoba, Sophomore, Biomedical Sciences

A28: Exploring Student Behavior in Physical Education: A Practice-Based Perspective.

Behavior management is a foundational component of effective physical education, yet the behavioral complexities of real-world classrooms are often underemphasized in teacher preparation programs (Korpershoek et al., 2016; Backman, 2020). This autoethnography examines a student teaching experience across elementary and middle school levels, utilizing reflective journaling and critical incident analysis to explore the discrepancy between university training and practice. Findings revealed three central themes: the impact of persistent low-level disruptions on

instructional efficiency, the difficulty of managing student refusal in large-group settings, and the necessity of flexible decision-making regarding when to intervene or strategically ignore minor behaviors. These results suggest that effective management is highly situational; immediate correction can occasionally escalate conflict, while selective nonintervention may preserve instructional flow. Ultimately, teacher education should prioritize experiential learning and applied behavioral strategies to better prepare educators for classroom realities.

Faculty Mentor: Jeongkyu Kim, Physical Education

Student Presenter:

Megan Spencer, Senior, Physical Education

A29: Does Google AI Studio produce APA compliant products?

This project explores whether the products produced by the newly developed Google AI Studio platform are compliant with published APA recommendations on the ethical and legal use of AI in clinical settings. To test this, we successfully built a prototype observational and diagnostic clinical app in Google AI Studio by using only the ICD-11 and DSM-5-TR as sources. Our research focuses on whether this app can meet the new standards for privacy and clinical use published by the APA. Because of new developments in Google AI Studio, this is ongoing research. We are still investigating the specific questions posed by the APA's regarding patient safety and data security. Our goal is to show that while AI is a powerful tool, clinicians must remain vigilant in protecting patient privacy, and we hope to provide insight into the developing interface between AI and clinical practice according to the recommendations of the APA.

Faculty Mentor: Michie Odle, Psychology

Student Presenter:

Anish Tokas, Senior, Psychology

Poster Session: B

1:50-2:50 - Bowers Lobby

B1: Algorithmic Reflections of Human Cognition: Intersectional Implicit Bias in AI-Generated Depictions of Cisgender and Transgender Men in Female-Dominated Occupations

The rapid diffusion of generative artificial intelligence has intensified concern regarding the reproduction of social bias within algorithmic systems. This study examines gender stereotyping in AI-generated workplace imagery, with particular emphasis on the comparative depiction of cisgender and transgender men in female-dominated occupations. This study conceptualizes AI image generation as a sociotechnical system that encodes and reproduces culturally embedded gender norms through training data derived from online media. Collectively, these findings reinforce the central theoretical premise: AI systems reflect and amplify existing human cognitive and cultural biases. The prioritization of race, age, and gender categories; the activation of occupational gender schemas; the instability of transgender representation; and the linguistic marking of marginalized identities demonstrate the model is a statistical mirror of representation patterns. Consequently, bias in AI image generation should not be interpreted as the computational manifestation of entrenched social cognition and structural inequality.

Faculty Mentor: Leslie Eaton, Psychology

Student Presenter:

Tylar MacIntyre, Junior, Psychology

B2: A Statistical Analysis of Prehospital Emergency Response on College Campuses

The response time of Emergency Medical Services (EMS) is a critical determinant of patient outcomes. However, it remains unclear whether response times differ between transport and non-transport EMS agencies on college campuses. Therefore, the purpose of this study was to compare response times between transport and non-transport EMS agencies for campus-related incidents using the National Emergency Medical Services Information System dataset. Agencies were categorized as transport or non-transport, and response time was defined as minutes from dispatch to arrival. A Welch's t-test was conducted; data are presented as median [IQR]. Non-transport agencies had significantly higher response times compared to transport agencies (8.32 [6.0-11.9] vs. 6.3 [4.4-9.2], $p < 0.001$). Future analyses should examine specific agency subtypes within the non-transport category to better understand variability in response performance across different EMS system types.

Faculty Mentor: Jared Rosenberg, Exercise Science

Student Presenter:

Nathan Bearup, Senior, Exercise Science

B3: Evaluating Fumarolamoeba as a Novel Amoebal Host for Legionella pneumophila

Legionella is a gram-negative bacterium naturally found in freshwater environments and man-made water systems. Free-living amoebae can phagocytize Legionella and serve as a host organisms. Decreases in water temperature or exposure to environmental stressors such as chlorine can cause the amoebae to form cysts, within which the Legionella can survive and continue to replicate. Eventually, Legionella causes amoebae lysis, releasing replicated bacteria back into the water. Preliminary research suggested that Legionella may also be present in Fumarolamoeba, a thermophilic amoeba, to further investigate this relationship, qualitative co-culture fluorescent microscopy was performed using red fluorescent protein (RFP) and green fluorescent protein (GFP) expressing Legionella with Fumarolamoebae. Fumarolamoebae populations grew to 14,750 amoebae per well and were exposed to a 50:50 mix of RFP and GFP Legionella at a ratio of 100 bacteria per amoeba per well. Microscopy results showed after 24 hours, amoebae were infected with either RFP or GFP Legionella in both the normal state and cyst states. After 48 hours, some amoebae contained both RFP and GFP Legionella in addition to amoebae containing only one type. After 72 hours, the clusters of GFP Legionella became more difficult to detect within amoebae.

Faculty Mentor: Christa Chatfield, Biology

Student Presenter:

Nicole Blazo, Senior, Biomedical Sciences

B4: Soil Monoliths for Science Communication

Soil monoliths are preserved intact soil ecosystems used for educational and artistic purposes. They increase accessibility for learning as students can investigate soil ecosystems without the need for digging a soil pit or traveling to a field site. Our long-term goal is to create soil monoliths that represent the various soil ecosystems of NY State to be used by SUNY Cortland students in introductory Biology courses. Here, we present our experience developing a method for creating soil monoliths in rocky New York soil ecosystems. This includes fabrication of an extraction frame that allows for the removal of an intact soil profile from a soil pit; mounting the profile; and preservation of the soil ecosystem for display. In Fall 2026, we successfully extracted and preserved a soil profile from forested soil ecosystem on campus. The major obstacle to successful soil monolith creation is the rockiness of local soils.

Faculty Mentor: Jesse Bloom Bateman, Conservation Biology

Student Presenter:

Morgan Bulger, Senior, Biology

B5: Analysis of PET Leachates in Simulated Ocean Water

PET is widely a widely used plastic, from containers to clothing, but is also often an environmental pollutant. In water, PET can leach chemicals into its surroundings by reactions like ester hydrolysis, yielding terephthalic acid and ethylene glycol. In different chemical environments, like ocean water, other degradation reactions may occur more commonly, altering resultant leachate profiles. To test this, four reactors were designed: PET degradation in DI water, PET degradation in simulated ocean water, and a plastic-free control for each. Presence of a soluble leachate buffer was confirmed in the DI with PET trial, as the reactor was buffered around pH 7. UV-Vis spectra were taken for each reactor, showing UV-B absorbances for reactors containing plastic and a much greater UV-B absorbance for the ocean water degradation trial. This suggests that ocean water PET degradation yields more UV-B chromophores than DI water PET degradation, and thus a distinct leachate profile.

Faculty Mentor: Jeffrey Werner, Chemistry

Student Presenter:

William Snyder, Junior, Chemistry

B6: Spectroscopy analysis of a "20th century" impressionist painting

A painting from France was suspected to be from the 20th-century. Paintings from this time use titanium dioxide and nontoxic organic pigments. Areas of interest were identified for pigment analysis which revealed the use of lithopone and lead white- calling the date into question. These materials were widely used in the late 19th-century. The darker green areas appear to be more stable and less like traditional organic pigments further illustrating the dating of the painting is flawed. Sampling of these areas was done for pigment analysis. Analysis of the canvas board backing was also done, revealing a non-acidic board. This support type was first produced in the 1860s. Multispectral imaging revealed areas of luminescence and enhanced the signature. Based on these findings, the artist is suspected to be HR Newman, who was active in France around 1870.

Faculty Mentor: Lynn Schmitt, Chemistry

Student Presenter:

Margaret Lawrence, Sophomore, Biomedical Sciences

Tristinye Martinez-Reyes, Sophomore, Physics

B7: Addressing Cell Line Misidentification with ECIS: Discriminating HeLa Variants Through Wound Healing Patterns

Cross-contamination and misidentification are persistent issues in cell culture, creating a need for the development of techniques to differentiate between closely related cell lines. This study used HeLa cell variants to evaluate whether Electric Cell-substrate Impedance Sensing (ECIS) can distinguish between cell types based on functional behavior. HeLa, one of the most widely used cell lines in biomedical research, exists in multiple variants, including HeLa 229 and HeLa Chang. We used ECIS to monitor impedance changes following electrically induced wounding and quantified differences in wound-healing dynamics among the three variants. Statistically distinguishable impedance recovery patterns would establish this proof-of-principle, potentially laying the groundwork for ECIS as a practical tool for cell line validation and experimental reproducibility. We are deeply grateful to Henrietta Lacks and her family, whose enduring legacy remains the foundation of countless scientific discoveries, may her contribution always be honored.

Faculty Mentor: Theresa Curtis, Biology

Student Presenter:

Julia Uhteg, Senior, Biomedical Sciences

B8: Cell Line Discrimination Using Electric Cell-Substrate Impedance Sensing

Cross-contamination and misidentification in cell culture pose major challenges to research reproducibility. Available genetic authentication methods are costly and have slow turnaround times, which limit their routine use. This study evaluates Electric Cell-substrate Impedance Sensing (ECIS) as a rapid, cost-effective method to distinguish cell lines based on biophysical signatures. We examined the parental HeLa cell line and two variants, HeLa 229 and HeLa Chang, representing a "worst-case scenario" due to shared genetic ancestry. Using electrode arrays, impedance was measured to assess cell attachment, proliferation, and barrier integrity. Cells were cultured to a stable confluent monolayer before a controlled electrical wound was introduced. As expected, wounding caused an immediate impedance drop, indicating loss of barrier function. Real-time recovery was then monitored as cells migrated and proliferated. Despite shared origins, the cell lines exhibited different impedance profiles and recovery kinetics, suggesting ECIS can serve as an automated tool for cell line discrimination.

Faculty Mentor: Theresa Curtis, Biology

Student Presenter:

Melanie Richter, Junior, Biomedical Sciences

B9: Comparative performance of machine learning models for diabetes prediction among US adults using NHANES data

This study compared six machine learning models for predicting diabetes mellitus among US adults using data from the 2017 to March 2020 National Health and Nutrition Examination Survey. Data from 6170 participants aged 20 years and older were analyzed, with self-reported diabetes as the outcome. Predictors included demographic characteristics, health behaviors, and body measurements. Descriptive statistics accounting for the complex survey design were used to characterize the population. Data were preprocessed using min max normalization and the Synthetic Minority Oversampling Technique to address class imbalance. Models were trained using grid search and 10 fold cross validation. Performance was evaluated using sensitivity, specificity, accuracy, and area under the curve. Random forest achieved the highest area under the curve (0.756) and sensitivity (0.537), while extreme gradient boosting showed the highest specificity (0.865) and accuracy (0.791). Sensitivity differed significantly across models ($p < 0.001$).

Faculty Mentor: Keshab Dahal, Mathematics

Student Presenter:

Shreya Dhital, Junior, Biomedical Sciences

B10: Mapping drinking water quality on SUNY Cortland campus: Where is the best-tasting water?

All drinking water on SUNY Cortland's campus comes from an unconfined sole source glacial aquifer system, however, students may notice that some drinking fountains taste better than others. This observation suggests that water quality may change as it travels through different buildings. The purpose of this study was to empirically determine the factors contributing to spatial variation in water quality and taste perception across academic buildings on campus. In March of 2026, 11 buildings with a total of 38 water fountains were sampled and tested for pH, conductivity, and temperature, and each was rated for taste on a scale of 1 to 5. Field data were compiled and analyzed using ArcGIS, Field Maps, Microsoft Excel, and R. Results showed limited variability in pH, with a range of 0.23 units (7.34-7.57). Conductivity had a broader change of 100 $\mu\text{S}/\text{cm}$ (663-763 $\mu\text{S}/\text{cm}$), while temperature displayed the greatest variability of 35.3°C (6.2-41.5°C). Statistical analysis indicated that all three variables have a significant effect on taste ($p < 0.001$). Higher conductivity, pH, or temperature is associated with lower average taste ratings. This study suggests that drinking water quality can vary in academic buildings across campus, which influences both measurable physicochemical properties and perceived taste.

Faculty Mentor: Li Jin, Geology

Student Presenter:

Aspen Eden, Senior, Environmental Geoscience

Ashley Siergie, Senior, Geographic Information Systems

Robert Cochran, Senior, Geographic Information Systems

Dylan Stringer, Senior, Environmental Geoscience

Zachary Biemer, Senior, Geographic Information Systems

B11: A Preliminary Exploration of Secondary Trauma in University Police Officers

Studying the effects of secondary trauma on university police officers is important, as the mental health of officers is critical to the safety and overall well-being of both officers and the community they serve. First responders, compared to the general population, are immensely vulnerable to secondary trauma and emotional stressors due to the duties they perform within their profession. Previous research has looked at the effects of witnessing traumatic experiences on law enforcement; however, studies have historically focused on local or state law enforcement without including university police officers. The current study will examine the various ways that secondary trauma and compassion stress influence university police officers, as well as its influence on their partners and family. Participants will complete an anonymous online survey regarding occupational stress and mental health symptoms relating to their profession. Results will be beneficial in improving effective relationships with the campus community, as well as the officer's well-being mental health.

Faculty Mentor: Karen Lister, Psychology

Student Presenter:

Camille McNicholas, Junior, Psychology

Jessica Kam, Junior, Criminology

B12: Temperature and Film Thickness Effects on Polymorph Diversity in Indomethacin Thin Films

Amorphous solids are compounds that lack a defined crystalline structure, allowing for increased solubility, making their behavior essential in pharmaceutical applications. However, reduced stability is often an obstacle to their desired function. In this study, the effects of film thickness and temperature on crystal growth and polymorph formation of indomethacin were researched to better understand structural development under varying conditions. Thin film samples of varying thicknesses were prepared by spin-coating out of varying concentrations of solutions and monitored over different time frames and temperatures to evaluate changes in crystal growth. Compared to prior work involving nano-confinement in nanoparticle packing, where crystal growth is often restricted, a greater diversity of polymorph formation was observed in these thin film systems. These findings suggest that environmental conditions during preparation play a significant role in determining structural variability, with important implications for drug stability, solubility, and bioavailability.

Faculty Mentor: Sarah Wolf, Chemistry

Student Presenter:

Frederick Sitner, Junior, Biomedical Sciences

B13: CaRI Nanoparticle Confinement on Crystallization Rate of Amorphous Indomethacin

A molecular glass is an amorphous solid with unique properties like improved solubility and bioavailability due to their liquid-like molecular arrangement. As these have use in bio-electrics, photovoltaics, and pharmaceuticals, research on stability of molecular glasses has increased. A method used to confine molecular glasses is capillary rise infiltration (CaRI), which utilizes nanoparticles to increase the surface area-volume ratio of the glass. To study the effects of CaRI

confinement on small-molecule glasses, indomethacin was used ($T_g = 42^\circ\text{C}$ or 108°F). The glasses were prepared with 100 nm, 10 nm, or no nanoparticles stored at room temperature in low humidity. Measurement of surface crystal growth was done over days while samples were kept in the mentioned storage conditions or for over an hour at 75°F . It was found that crystal growth rate decreased in confined samples below T_g , however there was little impact above T_g .

Faculty Mentor: Sarah Wolf, Chemistry

Student Presenter: Abigail Morse, Senior, Chemistry

B14: Comparing patterns of floral shape evolution between *Nicotiana* polyploids and diploids

Angiosperms-flowering plants-attract pollinators for reproduction. Flower shape is one trait that plants use to attract pollinators and strongly influences pollinator preference, yielding flower shape diversity across different pollinator systems. Polyploidy—whole genome duplication—is common in angiosperms with major evolutionary and genetic consequences. The genus *Nicotiana* contains polyploid and diploid species with diverse morphologies. For this study, we compare *Nicotiana* section *Suaveolentes* (older polyploids) with diploid *Nicotiana* species to explore differences floral shape evolution. We are creating ~8000 different silhouettes from front-facing photographs using Affinity Designer 2 to quantify shape variation. Using the R package, Momocs, we will perform Elliptical Fourier Analysis to estimate shape variation and create a shape morphospace. We will use these data to run ancestral character reconstructions to estimate floral shapes at ancestral nodes and calculate evolutionary trajectories between nodes to determine if polyploids and diploids show fundamentally different patterns of floral shape evolution.

Faculty Mentor: Elizabeth McCarthy, Biology

Collaborators:

Mark Chase, Royal Botanic Garden, Kew, UK

Corinne Mhiri, INRAE, Versailles, France

Marie-Angèle Grandbastien, INRAE, Versailles, France

Jacob Landis, Cornell University

Pamela Soltis, University of Florida

Douglas Soltis, University of Florida

Student Presenter:

Kendra Muscato, Senior, Biology

Co-researchers:

Marissa Mc Lean '05, Biology

Francesca Gambale, Sophomore, Biology

Erin Hamm, Senior, Biology

Kaylee Hughen, Sophomore, Biology

Kylie Nolan, First Year, Biology

Colin Woodruff, Senior, Biology

B15: Identifying Star Type from Analysis of Emission Spectrum of Three Bright Stars

A star's emission spectrum can reveal its stellar spectral type: O, B, A, F, G, K, M. These spectral types are organized primarily by temperature, with O stars being the hottest, and M stars being the coolest. Spectral types can also be combined with luminosity classes I-VII. Thus, identifying a star's spectral type is quite useful in identifying key stellar properties such as composition and evolutionary stage. We sought to determine whether our current equipment is sufficient to identify the spectral types of bright, visible stars. Using an 11" Schmidt-Cassegrain reflecting telescope, a Star Analyzer 100 diffraction grating and a NextImage5 telescopic camera, the emission spectra of three bright stars were captured: α Lyr (Vega), α Tau (Aldebaran), and α Aur (Capella). Analysis of the spectra showed that the equipment was sufficient to correctly identify their spectral types when compared with known spectra.

Faculty Mentor: Sean Nolan, Physics

Student Presenter:

Doug Stickles, Junior, Physics

Zach Taylor, Junior, Physics

B16: Synthesis of Membrane-Permeant Apppl Analogs

Triphosphoric acid 1-adenosin-5'-yl ester 3-(3-methylbut-3-enyl) ester (Apppl) is a triphosphate derivative formed when isopentenyl pyrophosphate (IPP) and dimethylallyl pyrophosphate (DMAPP) accumulate in excess within the mevalonate pathway. This pathway produces key biomolecules such as cholesterol, vitamin D, and coenzyme Q. Elevated levels of IPP and DMAPP are associated with cellular toxicity. It is not known if Apppl may play a role in mediating or contributing to this effect. Although Apppl has been observed to activate T cells and induce apoptosis in osteoclasts, suggesting possible roles in immune signaling and bone remodeling, its precise biological functions remain unclear. The major limitation is its high polarity and negative charge, which prevent passive diffusion through the cell membrane. To address this, we report the synthesis of membrane-permeant and photo-cleavable analogs of Apppl designed to release the triphosphate upon activation. Our approach couples an H-phosphonate precursor bearing a membrane-permeable group with adenosine diphosphate (ADP) di-tetrabutylammonium salt (2Bu4N⁺). ³¹P NMR spectroscopy confirmed the triphosphate linkage, and mass spectrometry verified the expected molecular mass. This work establishes a method for intracellular delivery of Apppl, enabling future studies to observe the intracellular effects of Apppl.

Faculty Mentor: Frank Rossi, Chemistry

Student Presenter:

Zachary Taylor, Junior

Charles Sorrentino, Junior, Biochemistry

B17: Sand Acting Against Gravity: An Exploratory Study

The phenomenon of granular motion plays a crucial role in various natural and industrial processes, including landslides and the transportation of granular materials. Vertically vibrated granular systems display strong behaviors such as collective flows and pattern formation. In this study, we investigate these behaviors in a system consisting of a mechanical wave driver, a Petri dish attached to the driver with a tilt, and sand as the granular fluid. Vertical displacement of the dish was

measured by reflecting a laser off a mirror mounted on the Petri dish. A primary objective of our work is to compare the formation of circular sand flow patterns against a theoretical model. The model defines a threshold of amplitude and frequency of the oscillations, below which no collective flows will occur, and individual sand grains will oscillate vertically with the dish.

Faculty Mentor: Eric Edlund, Physics

Student Presenter:

Mathew Paglino, Sophomore, Physics

Gabriel Austin, Junior, Physics

B18: Neural Regeneration and the Persistence of Learned Behavior in Planarians

Can memory be inherited from parent to offspring? Research has suggested that planarian flatworms show long-term memory retention even after the head is removed and regenerated, indicating that memory storage may not be confined to the brain but distributed throughout the nervous system. Terrestrial planarians such as *Bipalium kewense* produce offspring asexually through fragmentation of the posterior end of the body. Examining whether learned behaviors can be passed to offspring through asexual reproduction requires training adult *Bipalium kewense* to favor one chemical cue over another. We trained adult *Bipalium* to associate chemical cues with the positive reinforcement of feeding and tested whether they consistently associated the cue with feeding by measuring time spent on the preferred substrate and visit frequency per hour. After fragmentation, we tested offspring once they had grown their heads (three weeks old). The results may show whether *Bipalium* can learn behaviors and pass them on.

Faculty Mentor: Peter Ducey, Biology

Student Presenter:

Alexa Rose Pahila, Junior, Biomedical Sciences

Autumn Adkins, Junior, Biology

B19: The End of the AIAW and It's Impact on Women's College Sports

This poster will explore the impact of the dissolution of the Association for Intercollegiate Athletics for Women (AIAW) and its replacement by the National Collegiate Athletic Association (NCAA) on women's college sports. The transition during the early 1980s brought increased funding, national visibility, and expanded opportunities for female athletes through the NCAA's established reputation and business. However, it also led to significant changes in the structure and values of women's athletics. The collapse of the AIAW resulted in decreased leadership positions for women as well as a shift away from an athlete-centered, education-based model toward a more commercialized system. Additionally, many achievements from the AIAW era were overshadowed or neglected. Overall, the end of the AIAW changed women's college sports in both positive and negative ways.

Faculty Mentor: Brian Richardson, Exercise Science

Student Presenter:

Hannah Preble, Senior, Adolescence Education

B20: Lights, Cameras, Mentalization! Examining Gender Differences in Mentalizing Using the MASC

A key component of social cognition is mentalizing, the ability to interpret and understand one's own and others' mental states. This skill is crucial for effective social interaction, as it enables individuals to anticipate and respond to the thoughts, emotions, and intentions of others. Many mentalizing tasks lack ecological validity, reducing their applicability to real world social cognition. The present study examined gender differences in mentalizing using the Movie for the Assessment of Social Cognition (MASC), a naturalistic video-based task designed to evaluate the complex dimensions of mentalizing in a realistic context, in a sample of N= 180 undergraduate students. Responses were categorized into three error types: hypermentalizing, undermentalizing, and absent mentalizing. A total incorrect mentalization score was also calculated. Results of Independent samples t-tests showed that men made significantly more total and hypermentalizing errors than women, while no significant gender differences emerged for under- or no mentalizing.

Faculty Mentor: Alexandra Vizgaitis, Psychology

Student Presenter:

Nicolette DeCicco, Senior, Psychology

(NO POSTER B21 & B22)

B23: Deformation of laminated sandy limestone

The Taconic mountains, formed during the Late Ordovician when a volcanic island arc collided with Laurentia. From the building of the Taconic mountains, today we see rocks such as marbles that formed as sedimentary limestone rocks were metamorphosed. In this study, we did an experimental investigation to test how deformation changes the pre-existing structure in a sedimentary rock, to simulate the processes active during mountain building. For the experiment, we collected a sample of sandy, finely laminated limestone from the Stockbridge formation in Columbia County, New York and deformed it to see what the effects of temperature, pressure, and differential stress are on the original sample and to compare this result to the effect of temperature and pressure without the deformation. Deformation was performed in a solid media apparatus, known as the "Griggs rig," in which we deformed samples at 900 °C, 1300 MPa pressure, for 10 hours. Samples were shortened to about 60% of their initial length, resulting in a Stretch (S) of .599, and an average strain rate of 1.6×10^{-5} 1/s. Thin sections were made of the samples and examined using a petrographic microscope and a scanning electron microscope.

Faculty Mentor: Gayle Gleason, Geology

Student Presenter:

Haileigh Rhodes, Senior, Geology

B24: Using GIS for Geointelligence Analysis of the Threats to the Gulf of Aden.

The Gulf of Aden is a strategically critical maritime corridor linking the Red Sea to the Arabian Sea, serving as one of the most important passages for global trade between Asia and Europe through the Suez Canal. Along its history, the region has faced significant security challenges, including Somali Pirates, and attacks associated with the terror organization in Yemen, the Houthis, mainly using

missiles, drones and waterborne improvised explosive devices. The area's vulnerability comes from dense maritime traffic and proximity to politically unstable regions. This study seeks to provide a geointelligence analysis of the Gulf of Aden by reviewing historical incidents, evaluating recent events, and forecasting potential future occurrences using risk mapping and prediction models. By integrating GIS, records of maritime incidents and AI techniques, the study targets highlighting risk zones, detecting threat patterns, and serving as a mitigation strategy tool for ocean traffic stability.

Faculty Mentor: Christopher Badurek, Geography

Student Presenter:

Ron Halawani, Senior, Geographic Information Systems

B25: Synthesis and Electronic Characterization of Disubstituted 2-Phenyl-1,3,2-benzodiazaborole Derivatives

A library of amide- and carboxy- functionalized 2-phenyl-1,3,2-benzodiazaborole derivatives was synthesized via microwave-assisted cyclic condensation to explore the effects of pseudoaromaticity on charge-transfer complex (CTC) formation and photophysical behavior. All compounds were characterized by NMR, IR, UV-vis, and fluorescence spectroscopy. While absorbance profiles remained consistent ($\lambda_{\text{max}} = 298 - 324 \text{ nm}$), several derivatives exhibited strong bathochromic emission ($\lambda_{\text{em}} = 363 - 555 \text{ nm}$) and exceptionally large Stokes shifts ($\Delta\nu > 150 \text{ nm}$), particularly those bearing -OCH₃ groups. Red-shifted fluorescence and DFT calculations suggest antiparallel dimeric CTCs stabilized by B-N delocalization. These results highlight amide- and carboxy- 1,3,2-benzodiazaborole frameworks as tunable pseudoaromatic systems with potential applications in optical sensing and functional material design.

Faculty Mentor: Julius Green, Chemistry

Student Presenter:

Bradley Blake, Senior, Biochemistry

B26: Structures of *S. h. jingganensis* L-DOPA Dioxygenase Provide Mechanistic Insights

Dioxygenases are a family of enzymes that perform a wide range of chemical reactions including oxidations, reductions, and cleavage all using molecular oxygen as a substrate. We have characterized an important enzyme from this family, L-DOPA dioxygenase from *Streptomyces hygrosopicus jingganensis*, obtained from our collaborators at Muhlenberg College. Here we describe our work on the structural characterization of a series of L-DOPA dioxygenase proteins. We have compared these structures to the structure of the protein homologue from *Streptomyces sclerotialis* (PDB ID: 6ON3). The current hypothesis is the relatively large active site of the *S. hygrosopicus jingganensis* allows for broader substrate specificity.

Faculty Mentor: Katherine Hicks, Chemistry

Student Presenter:

Amelia Konstanty, Junior, Biochemistry

(NO POSTER B27)

B28: Examining Group-Based Instruction in an Elementary After-School Physical Activity Program

Introduction

Group-based instruction is widely advocated in physical education literature as a pedagogical approach that promotes student engagement, collaborative learning, and social development (Vangrieken et al., 2015). This autoethnographic study examines experience with group-based instruction during an early field experience in an elementary after-school physical activity program, focusing on its pedagogical implications.

Method

Data sources included weekly reflective journals and field notes collected throughout one semester. Ongoing reflective conversations with mentors informed the interpretive process. An iterative, reflexive thematic analysis examined how group-based instructional practices unfolded.

Findings

Three themes emerged. First, group-based instruction increased peer interaction and enthusiasm, showing how collaboration shapes engagement. Second, inequities within the teaching team appeared as differences in skill and confidence led some to dominate while others disengaged. Third, group instruction increased management demands, requiring constant monitoring and adjustment.

Conclusion

The experience revealed group-based instruction as both productive and demanding, requiring continual adjustment rather than serving as a universal best practice.

Faculty Mentor: Jeongkyu Kim, Physical Education

Student Presenter:

Avery Merrihew, Junior, Physical Education

(NO POSTER B29)

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