MONMOUTH UNIVERSITY | HONORS SCHOOL

THE HONORS SCHOOL

RESEARCH CONFERENCE

SPRING 2025

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HONORS SCHOOL RESEARCH CONFERENCE SCHEDULE

FRIDAY, APRIL 25, 2025
GUGGENHEIM MEMORIAL LIBRARY ROOM 101

OPENING REMARKS:
Acting Dean Jennifer Ross

SESSION A: 9:35AM - 10:40AM

Christie Kollydas, *BS Business Administration (Small Business Management and Entrepreneurship)*
Giovanni DeNatale, *BA Political Science*
Zoe Lohne, *BS Homeland Security*
Ashley Zingillioglu, *BA English (Creative Writing)*
Ava Allen, *BS Chemistry*

SESSION B: 10:50AM - 11:55AM

Zaccery Tarver, *BS Computer Science*
Victoria Tuffy, *BS Mathematics and Secondary Education*
Kathleen Gennings, *BS Health Studies/Exercise Science Cluster*
Jenna Kemp, *BS Health Studies/Health Science Cluster & Doctor of Occupational Therapy*
Samantha Tolentino, *BS Health Studies/Health Science Cluster*

SESSION C: 12:05PM - 1:10PM

Alexander Kalina, *BS Biology (Molecular Cell Physiology)*
Lola Weis, *BS Biology (Molecular Cell Physiology)*
Christopher Reigel, *BS Marine and Environmental Biology and Policy*
Brooke van de Sande, *BS Marine and Environmental Biology and Policy*
Colt Ingram, *BS Business Administration (Economics)*

SESSION D: 2:45PM - 3:50PM

Remington Johnson, *BS Business Administration (Finance and Real Estate)*
Angelo Prado, *BS Biology (Molecular Cell Physiology)*
Taylor Johnson-Bradley, *BA Sociology*
Justin Irvin, *BS Biology (Molecular Cell Physiology)*
Shelby Brodhead, *BS Marine and Environmental Biology and Policy*

SESSION E: 4:00PM - 5:05PM

Gianna Rao, *BS Software Engineering*
Alexa Houseknecht, *BS Biology (Molecular Cell Physiology)*
Reese Cioffi, *BS Nursing (Pre Licensure)*
Jaqueline Mazza, *Bachelor of Social Work*
Briana Rutter, *BS Business Administration (Finance)*

THESIS ABSTRACTS

Christie Kollydas | FIRST READER: DR. STUART ROSENBERG
SECOND READER: DR. JOE PALAZZOLO

Comic CONnections: A Podcast to Help Small Businesses Grow at Comic Con

This study is about the effects that comic conventions, known as comic cons, have on small business owners that sell at the event. Comic cons are divided into different sections. The show floor focuses on exhibitors that sell products that they have bought from companies, like toys and books. There is artist alley, where artists sell their original artwork and crafts. These conventions are often the only place business owners can promote their work in person. This study determined how to sell more while vending and the effects selling at conventions have on small businesses after the event occurred.

The artists at comic cons are small businesses and work hard to make a living doing what they love to do. Although not all conventions are successful, owners need to learn how to market themselves for the future and online business; online sales will help them fund their convention fees and an online presence will make a store more noticeable. The table display, sales pitch, and the buyer and seller relationship have made an impact on a business's success. This research led to a six-episode podcast featuring guests with different perspectives on selling at comic cons and its effects.

Giovanni DeNatale | FIRST READER: DR. KEN MITCHELL

Bronze Gold: The Political Economy of Copper

Political economy has been observed through various theoretical lenses, beginning with Adam Smith's foundational ideas and extending through the contributions of men such as David Ricardo, Karl Marx, and John Meynerd Keynes. This paper focuses on the perspectives of three modern political economists—Thorstein Veblen, Douglass North, and Ha-Joon Chang—comparing their views on economic growth and its barriers. First, there is a sector-wide analysis completed of copper that underscores the importance of the mineral as well as the major players involved in the trade industry. Afterwards, an examination of Argentina's copper industry through a comparative case study answers whether Argentina's copper industry has been driven by external geopolitical forces or domestic institutional upgrading. The analysis ultimately uncovers which institutional economic model best explain the Argentine story. The case study shows that the growth of the copper industry can be attributed to the rise of copper's importance on the global stage.

Zoe Kristina Lohne | FIRST READER: DR. MEG FORNEY

Parental Knowledge of Location-Sharing on Social Media Apps

This research study examines parental understanding of location-sharing on social media and its implications for youth safety and privacy. The purpose of this study is to address the growing concern of parents being unaware of the risks posed by location-sharing, more specifically those on social media applications like Snapchat and Instagram. This leaves youth vulnerable to digital and cyber threats. Preliminary findings through an extensive literature review show there is a significant knowledge gap among parents, specifically with parents being unaware of how location-sharing features work and the extent to which their children use those features. This study concludes that targeted education through an educational presentation and a take-home pamphlet are needed to help parents and guardians better understand and manage location-sharing risks.

Ashley Kate Layog Zingillioglu | FIRST READER: DR. MARY HASPEL SECOND READER: PROFESSOR AMANDA STOJANOV

Talking with Friends: An Interactive Social Story for Students with Autism

Students on the autism spectrum typically exhibit social communication deficits that impede their ability to build interpersonal relationships in classroom settings. Although social stories have been traditionally used to teach these skills, students require scaffolding to apply what they learned in a safe environment. Fortunately, the popularization of digital technology has enabled alternative opportunities for skill acquisition. Interactive social stories (ISS) in particular, have been utilized to teach students behavioral strategies during recess, causing researchers to recognize these tools as a supplemental means of instruction.

Despite these contributions, research has yet to fully explore the potential of ISS, particularly its choice-based components. Therefore, an ISS prototype has been developed to address these conversational challenges. Through the creative coding library p5.js and the text-to-image AI service Midjourney, this ISS prototype encourages socialization through teaching four social skills: identifying appropriate conversation topics, choosing appropriate responses, conversing, and staying on topic. This iterative process involved writing a narrative script, designing a wireframe, game screens and finally, coding the prototype. While the prototype is complete, experimental studies are necessary to evaluate its efficacy on students' socio-communicative learning and its broader applicability within educational contexts.

Ava Allen | FIRST READER: DR. STACY DREWSON

Sports Psychology Resources: Experiences and Perceptions of Injured Student-Athletes at Monmouth University

One in five student-athletes experience some type of mental health challenge throughout their careers, and data shows that injuries often increase or result in the onset of mental health symptoms. Sports psychology can be an effective method for promoting a positive injury rehabilitation process and can be utilized by Division 1 programs to help athletes work through and cope with mental issues and feel more confident returning to play. By coupling physical recovery sessions with sports psychology appointments during the injury recovery process, athletes may be more receptive to seeking other forms of help, feel more supported, have an overall better recovery experience, and feel more comfortable returning to play than athletes who only utilize physical rehabilitation sessions. A survey was used to measure experiences and perceptions of injured student-athletes at Monmouth University in regard to sports psychology resources. Findings indicated that Monmouth University student-athletes, overall, had positive injury recovery experiences; however, no statistically significant relationship could be found between recovery experience ratings and the resources utilized. Results suggest that while athletes had generally positive recoveries, there is still progress to be made—particularly in increasing awareness about the role of sports psychologists and reducing mental health stigma within the athletic community at Monmouth.

Zaccery Tarver | FIRST READER: DR. ROLF KAMP SECOND READER: DIRECTOR MIKE WALSH

Check I/O: Instantaneous Visit Logging System

Barcode scanners are standard in modern retail. They are highly effective at information retrieval, which enables quick customer interactivity. Barcode scanners are optimal in settings where consumers make recurring appearances to the monitored environment. Therefore, these hardware devices have much potential in areas of organized work and recreation. A lightweight computer application (Check I/O) has been developed to allow efficient checking-in and checking-out of organization members. This program is written using Java and the JPOS software package from Zebra Technologies and uses a Zebra LS2208 barcode scanner. The barcode scanner scans in clients as they check-in and check-out using ID cards with unique barcode labels. Logs are automatically exported in convenient file formats when the program closes, and logging history is saved as well. Since this program is built on open-source software, it is a cost-effective solution for grassroots organizations to keep an accurate history of membership activity. It is also suitable for higher-order organizations to use a local application, instead of outsourcing a third-party application, which can be costly and unintuitive to administrative needs.

Victoria Tuffy | FIRST READER: DR. SANDRA ZAK SECOND READER: DR. KARA TEEHAN

The Impact of Yoga on Math Anxiety

This project looked at the correlation between physical activity, specifically yoga, and students' anxiety in their math class. The research objective was to determine if yoga reduces stress and anxiety and increases self-confidence in a mathematics classroom, specifically in first year Monmouth University math courses. Students portrayed their feelings towards their mathematics class on a pre-activity survey, completed a short yoga session, and then answered the same questions on a post-activity survey. The yoga poses selected were those which focus on breathing and self-calming techniques. It was found that yoga made students less apprehensive about their upcoming math courses, assignments and exams. Many participants illustrated their dislike towards math, but expressed how the yoga session made them feel relaxed and more open to learning math. This project can help create generalized ideas discussing if and/or how yoga and physical activity can change students' confidence in math. This project can also lead to further studies on how physical activity in an educational classroom can affect students in different disciplines. Mathematics is not liked by many, so exploring different ways to engage students and interest them in learning math is important.

Kathleen Gennings | FIRST READER: DR. JAMIE PIGMAN

The Effects of Exercise and Physical Activity on Pediatric Cancer Patients

This study investigates the role of exercise and physical activity in improving the health and quality of life of pediatric cancer patients and survivors. The purpose of the project was to evaluate the therapeutic potential of structured exercise in mitigating treatment-related complications such as fatigue, cardiovascular decline, and muscle deterioration. Given the long-term physical and psychological effects of pediatric cancer treatment, this topic addresses a critical gap in survivorship care. Through a comprehensive literature review of peer-reviewed sources, the study identified significant benefits of aerobic and resistance training—including enhanced muscle strength, reduced fatigue, and improved emotional well-being. Anti-inflammatory mechanisms triggered by exercise, such as myokine release, were also found to support metabolic and cardiovascular health. In response to barriers like inaccessible academic resources and limited public understanding, this project developed a user-friendly pamphlet and interactive website. These tools translate complex findings into engaging, evidence-based recommendations for patients, caregivers, and clinicians. The study concludes that structured exercise is a safe, effective, and accessible intervention that should be integrated into pediatric cancer recovery and long-term care.

Jenna Kemp | FIRST READER: DR. DENISE CROWLEY

Enhancing Dressing Independence in Older Adults with Parkinson's Disease

Parkinson's Disease is a debilitating, neurodegenerative disorder increasing in prevalence as the older adult population continues to grow rapidly in the United States. Occupational therapy has been found to be effective for treating Parkinson's symptoms, as it can address both physical and cognitive impairments caused by the disease. As older adults with the disease experience a decline in their functional performance, assistance in completing activities of daily living becomes necessary, and therefore increases caregiver burden. This project focuses on cognitive, compensatory, and physical training strategies in which individuals with Parkinson's can try at home in an effort to increase their independence in dressing activities while decreasing caregiver burden. Much of the current literature surrounding treating Parkinson's with occupational therapy does not include evidence of longitudinal improvements for older adults with the disease. The handbook created for this project addresses this gap in the literature by combining a variety of interventions that can be applied at home to best sustain dressing independence in older adults with Parkinson's Disease.

Samantha Tolentino | FIRST READER: DR. KERRY CARLEY-RIZZUTO SECOND READER: PROFESSOR ALICIA JEROME

The Effect of Screen Time on Speech and Language Development in Toddlers

Screen time has increased over the most recent years, and there is concern about how much is too much, especially for toddlers. Screen time is defined as any exposure to electronic media including television, videos, video games, and personal devices. A notable population focused on in current research is children under three years old. The increase of screen time, especially during the COVID-19 lockdown, has raised concern about the harmful effects of screen use on early development. This literature review analyzes articles that examine the relationship between screen time and speech and language development in toddlers. An informational pamphlet and interactive website on how parents/caregivers can prevent the negative effects of screen time for their children were created based on this information. The effect of screen time can be positive or negative. It depends on the quality of the screen content, such as the video characteristics and educational quality. It also depends on the involvement of their caregivers who play a significant part, such as in managing the child's screen time, managing their own screen time, and prioritizing parent-child interactions. Lastly, the effects of screen exposure depend on the amount of screen time consumed and the use of screen-free time.

Alexander Lech Kalina | FIRST READER: DR. JEFFREY WEISBURG SECOND READER: DIRECTOR ALISON GILBERT

Investigating the Influence of Physician Engagement on Patient Recruitment in Clinical Trials

Clinical trials are a fundamental stepping-stone in biomedical research and innovation, serving as the cornerstone where breakthrough medications are assessed and brought to patients. They are essential in improving patient outcomes and addressing incurable diseases. However, burdens on clinical trials, most notably patient recruitment, prevent trials from reaching their maximal potential in terms of speed and efficiency. Approximately 80% of all clinical trials are delayed due to constraints on patient recruitment; and the consequences of such delays are deferred treatment approvals, burdens on patients and families, and pharmaceutical sponsors facing substantial losses potentially totaling millions in infrastructure and lost revenue.

This research identifies physician engagement within clinical research as the pain-point holding patients from enrolling in clinical trials. This paper investigates physician engagement's role in patient recruitment by reviewing 25-peer reviewed articles, government reports, and industry publications; and 20+ interviews from industry professionals (pharmaceutical companies and contract research organizations). The analysis finds key constraints such burden of time, paperwork, lack of experience, and lack of education. The study also highlights key solutions such as health care provider training programs and support services.
(Dean Ross note - the bolded words are a new paragraph; can we just add a space?)

Lola Weis | FIRST READER: DR. RICHARD BASTIAN

The Evolution of Statistics and Technology in Biological Research

As biological research has become more reliant on data, the role that statistics and advanced technology play has increased significantly from the past, changing the way that research is done and interpreted. Focusing on the integration of these tools in biological research, this project examines the influence of these tools over time. Using a literature-based methodology, this study analyzes both past and present research findings, focusing on trends in data collection, the use of programming tools, and the implementation of artificial intelligence in research. The data shows a shift from only manually calculated experiments to more current large-scale studies that use advanced computational methods for large amounts of data. The increase in the use of technology has allowed for questions to be answered that were not possible in the past. This has also introduced ethical challenges related to data privacy and usage. Overall, this project highlights the importance of collaboration between math, computer science, and biological sciences in data interpretation and notes the importance of responsible integration of technology in advancing biological research.

Christopher Reigel | FIRST READER: DR. JASON ADOLF
SECOND READER: DR. KEITH DUNTON

Comparative Study of qPCR eDNA Analysis with Capture Data for Atlantic Sturgeon, Acipenser oxyrinchus oxyrinchus, in the New York Bight

The Atlantic Sturgeon (Acipenser oxyrinchus oxyrinchus) is a native endangered fish of historical ecological and commercial importance. Due to its endangered status, the Atlantic Sturgeon is currently monitored by various state and federal agencies. However, sturgeon population data is limited by current monitoring methods. To evaluate the strength of an eDNA qPCR assay for the quantitative monitoring of Atlantic Sturgeon, water samples were collected from adjacent to gillnets deployed for an acoustic tagging study conducted by the Dunton Lab at Monmouth University. Those samples were processed through qPCR and compared against the value of sturgeon per net, indicating a positive regression ($p = 0.00807$; $R2 = 0.93$) between the eDNA and physical capture data. Samples were also taken from a reserved bank of eDNA extracts from a previous eDNA metabarcoding monitoring project that had indicated a high proportion of sturgeon in the fish community structure. However, the qPCR assay failed to amplify any sturgeon DNA in those samples. Overall findings indicate eDNA as a useful tool to augment traditional surveying for Atlantic Sturgeon, with improvements to be made to the qPCR assay tested.

Brooke van de Sande | FIRST READER: DR. JASON ADOLF

Identifying Relationships Between Visual Sightings and eDNA Detections of Humpback Whales (Megaptera novaeangliae) Along the Coast of New Jersey

Over the past decade, there has been an increase in marine mammal visual sightings along the coast of New Jersey. Specifically, juvenile humpback whales (Megaptera novaeangliae) are frequently observed during the summer months, coinciding with their feeding season. The lack of sufficient research in this region, paired with increases in local mortality events, amplifies the need for effective management of cetaceans through continuous monitoring of habitat use and migration patterns. Environmental DNA (eDNA) analysis is an emerging tool that has successfully detected whales and other marine mammals over large spatial and temporal scales. We compared detections of humpback whales by eDNA metabarcoding to confirmed visual sightings. Environmental data such as whale behavior, water temperature, and prey presence were recorded for each sample. The proportions of eDNA detections displayed a non-significant difference between sighting and non-sighting samples for both humpback whales and bottlenose dolphins. Although a statistical difference was not found within the study, the future development of non-extractive techniques for monitoring whales may improve monitoring capacity and reduce observation biases when paired with visual surveys. The information gained from this study will add to local ongoing monitoring research that aims for better protection and conservation of these local marine mammals.

Colt Ingram | FIRST READER: PROFESSOR NOEL BELINSKI

Creating Viking Age Historical Fiction

This project is a creative capstone that uses historical and scholarly research to support the development of a historical fiction novel set during the Viking Age. The project explores how best-selling historical fiction can educate readers while remaining engaging and emotionally resonant. A wide range of primary and secondary sources are used to inform the setting, social structure, mythology, and cultural practices of the Viking world. These include archaeological data, legal texts, epic poetry, and accounts from travelers of the age. In addition to historical research, the project draws from writing guides and literary theory to inform narrative structure, character development, and world-building techniques. Inspiration is drawn from existing works that successfully merge fiction with educational depth, such as *All Quiet on the Western Front* and *Percy Jackson*, which demonstrate how entertainment-driven stories can teach readers about past societies and belief systems. The final product aims to be both accurate and imaginative, balancing historical integrity with creative storytelling. Through this approach, the project seeks to demonstrate the value of fiction as a method of historical interpretation and public education, while offering a compelling narrative that brings Viking history to life.

Remington Johnson | FIRST READER: PROFESSOR JOHN BURKE

A Composite Risk Framework for Sovereign Debt Distress in the World's Largest Economies

This research examines which economic, financial, and institutional variables are most statistically correlated with sovereign debt crises, focusing on how these relationships vary across the 30 largest global economies. As sovereign debt levels rise and financial conditions tighten, identifying early warning indicators of debt distress has become increasingly important for policymakers and investors. Using a panel dataset from 1980 to 2023, the study analyzes variables such as foreign exchange rate volatility, long-term bond yields, and capital market performance. Institutional risk is incorporated using the IMF-World Bank Debt Sustainability Framework (DSF). The methodology centers on constructing a sovereign risk score through a weighted equation that combines these indicators into a single, interpretable metric. The score is validated against historical sovereign debt events to identify consistent risk patterns across countries and over time. Findings reveal important differences between emerging and developed economies, particularly regarding currency mismatches and reliance on external borrowing. This study provides a practical and transparent framework for quantifying sovereign debt risk. The resulting risk score offers a simplified tool to support early warning assessments and enhance comparative debt sustainability analysis for use in research, investment decision-making, and policy evaluation.

Angelo Augusto Prado | FIRST READER: PROFESSOR AMREETA CHOUDHURY

Good Choices Capstone Project

In recent years, the United States has seen a significant rise in its international student population, highlighting the importance of providing essential resources to support their academic success. This capstone project, titled Good Choices, explores the benefits of mentorship for international students in both academic and socioemotional contexts, through the lens of growth and fixed mindset theories.

The primary goal of the study was to help international students better understand and navigate the U.S. educational system by implementing a website designed to promote growth mindsets, discourage fixed mindsets, and reduce acculturative stress. The created website serves as a platform to offer targeted resources and support. Additionally, the research examined whether mentorship-based programs are effective in alleviating the acculturative stress often experienced when adapting to a new cultural environment.

Previous studies have highlighted the role of mentorship in assisting international students with cultural adjustment, identifying effective mentorship strategies and their positive impact on mental health. Research has also shown that fostering a growth mindset can significantly improve students' academic performance and overall well-being.

Taylor Johnson-Bradley | FIRST READER: DR. JOHANNA FOSTER
SECOND READER: DR. JEN McGOVERN

The Playbook of Perception: Race, Colorism, and Discourse of NFL Quarterbacks on Social Media

This study examines how race and skin tone shape fan perceptions of NFL quarterbacks on social media. Specifically, it asks: How do perceptions of fans of NFL quarterbacks differ by race and skin tone on social media and why? While previous research has analyzed racial bias in sports media, this project specifically focuses on user-generated content, and analyzing over 600 Youtube comments to discover patterns in how Black, White, and Mixed/Light-skinned quarterbacks are discussed. The study is grounded in Critical Race Theory and the work of W.E.B. Du Bois, and attention to how racial narratives and colorism continue in digital fan spaces. Findings show that Black and Mixed-race quarterbacks were more likely to receive critical or dismissive comments, especially around ability and athleticism, while White quarterbacks were more frequently praised. Neutral comments were consistent across groups, and expected differences in football IQ and leadership did not appear. The study reveals how fans can reproduce racial narratives in subtle ways online.

Justin Irvin | FIRST READER: DR. GREGORY MOEHRING
SECOND READER: DR. DATTA NAIK

Cytotoxicity of Rhenium (I) Tricarbonyl Complexes

Present chemotherapy drugs, including alkylating agents, antimetabolites, anthracyclines, and taxanes, are often effective but provide limited selectivity and have severe side effects including: anemia, vomiting, and ulcers. Carboxylate-stabilized rhenium (I) complexes that include three carbonyl ligands may prove more selectivity than current platinum-based drugs (e.g. cisplatin), leading to fewer serious side effects. These rhenium (I) complexes may offer greater selectivity, which could improve cancer treatment outcomes and reduce harmful side effects. Rhenium (I) tricarbonyl complexes are currently in limited preclinical studies for testing. Novel complexes were prepared and synthesized. Novel methods for synthesizing various complexes were addressed. Complete characterization of complexes and cytotoxicity testing via HSC-2 oral cancer cells and HF-1 normal oral cells occurred. A cytotox mechanism was established if the complex was cytotoxic. Formate and difluoro acetate were the most selectively cytotoxic rhenium (I) tricarbonyl complexes, eliminating the HSC-2 cells significantly moreso than the HF-1 cells. This expresses the potential for rhenium (I) complexes as future chemotherapeutic drugs. Examining rhenium (I) complexes's mechanism of action via fluorescence microscopy and experimenting with variations of platinum-based metals will occur in future studies.

Shelby Brodhead | FIRST READER: DR. PEDRAM DANESHGAR

Pollinator-Prey Conflict with Carnivorous Plants in the New Jersey Pine Barrens

The New Jersey Pine Barrens is an ecosystem unlike any other found in the world. It can support highly specialized species such as pitcher plants, which are carnivorous, meaning they have modified leaf structures, trapping arthropods to supplement nutrients in poor conditions. Recent work has examined the carnivory of pitcher plants but has not thoroughly investigated their pollination, leaving the remaining question: how do pitcher plants avoid trapping the insects they need for pollination? Research was conducted in June and July of 2024, investigating thirteen sites containing purple pitcher plants (Sarracenia purpurea). Arthropod visitation to the flowers was analyzed through visual observation and GoPro footage sampling, while pitcher visitation was conducted through pitcher fluid analysis. The data analysis indicated that ants (Formicidae), wolf spiders (Lycosidae), pitcher-plant mosquitos (Wyeomyia smithii), and pitcher-plant midges (Metriocnemus knabi) were found inside the pitchers while winged insects such as damselflies (Zygoptera), mosquitoes (Culicidae) and dragonflies (Odonata) along with jumping spiders (Salticidae) were found almost exclusively on the flowers. Pollinators are attracted to the nectar and pollen in the flowers, or the arthropods that feed on both, while prey are attracted to the nectar on the pitcher's edge and the moist environment.

Gianna Rao | FIRST READER: DR. RAMAN LAKSHMANAN

Setify: An online catalog of concert setlists, including opening and headlining acts, and related information about the songs

This study looked at the benefits of an online catalog of music artists' concert setlists, opening or headlining acts, and related information about the songs in concerts. Prior to this project, there was no online system that allowed concert setlists to be categorized into playlists that include the opening acts' and headliners' setlists and a way to listen to the songs and view the lyrics. This project was needed to allow fans to feel connected to artists' tours, even if they are not able to attend the concert, and to help fans discover new artists through the inclusion of the opening acts' setlists. The methodology was to create an online repository and catalog service that includes all of these features. Important factors in creating this online repository and catalog service were personalization in creating and viewing the playlists, best practices of software design, providing a way to listen to the songs, and providing a way to view the lyrics of the songs. Using tools such as Xcode, Swift language, MongoDB database, Node.js Express, and Postman for testing, an iOs application called Setify was created.

Alexa Houseknecht | FIRST READER: DR. DAVIS JOSE SECOND READER: DR. ELLEN DOSS-PEPE

Investigating local conformational changes from ligands on G-Quadruplex complexes using fluorescent base analogues

DNA sequences rich in guanines readily form G-Quadruplex structures (GQs), which are non-canonical DNA structures located at telomeric and various promoter regions. GQs play a crucial role in physiological functions, including the limitation of telomerase activity observed in 85-90% of human tumors. Telomerase activity is influenced by ligands that interact with GQs, altering their stability and conformations which affects telomerase activity and cancer progression.

Local conformational changes of the telomeric GQ with ligands were monitored by incorporating 6-methylisoxanthopterine (6MI), a fluorescent base analogue of guanine. Site-specific incorporation of 6MI in place of guanines made it possible to create a fluorescent G-tetrad layer in the GQ. Using UV-Vis, CD, and fluorescence spectroscopy, changes in the GQ structures at a global and local level were monitored. Past studies showed that TmPyP4, a telomerase-inhibiting ligand, can interact with GQ. We tracked the local and global conformational changes of GQs at individual G-tetrads upon binding TmPyP4. Our results showed that the effect of TmPyP4 on the stability of GQ depends on the probe position and these probes can be used as "intrinsic sensors" to monitor GQ structural changes. These studies will help to design targeted therapeutic drugs against cancer and other telomeric-related diseases.

Reese Cioffi | FIRST READER: DR. POLINA AMBURG

Pediatric Mental Health Screenings

Mental healthcare has been receiving more attention over the past few years and is becoming more a part of the mainstream of healthcare, however many problems persist. With advancements in treatment options, timely diagnosis and early detection are crucial, especially in the pediatric population. There is evidence in the literature demonstrating the positive correlation between early detection and health outcomes. Early detection and timely intervention are crucial in management of mental health issues in children and adolescents. Unfortunately, there are still barriers preventing efficient access to early interventions in this population. The following paper has explored this issue through research on current publications and studies exploring mental health concerns in the adolescent populations. This research was conducted through a qualitative search to conduct a literature review on currently available articles regarding adolescent mental health. What this research has found is the prevalence of mental health conditions in adolescents, barriers to reaching care for adolescents, and solutions to these barriers and early interventions.

Jaqueline Mazza | FIRST READER: DR. REBECCA SANFORD

Jealousy in the Feed: Love & Comparison in an Online World

The objective of this study is to deepen existing understandings regarding social media influence on romantic relationships and identify where the line is drawn between what is considered acceptable versus inappropriate when it comes to romantic partners liking or interacting with posts, ranging from tame to racy or suggestive. Grounded in an extensive literature review, the research builds upon pre-existing findings related to the evolving nature of modern dating and the psychological effects that digital platforms have on self-esteem and relationship satisfaction. Data was collected through an IRB-approved Qualtrics survey administered to participants aged 18-35. The survey incorporated likert-scale questions and AI-generated images of realistic human beings to simulate typical social media scenarios between romantic partners. Quantitative analysis using both descriptive statistics and correlation tests revealed significant correlations between increased social media exposure and decreased self-worth in romantic relationships, most particularly when viewing content involving what the user deems to be attractive third parties with over half of participants had experienced jealousy due to a partner's social media activity. These findings emphasize the need to continue to gain understanding of the growing role that social media plays in shaping emotional regulation and boundaries within romantic relationships.

Brianna J. Rutter | FIRST READER: DR. TJEERD BOONMAN

Transportation Challenges for Low-Income Individuals in the New York City Metro Area

This research investigates the impact of transportation costs, reliability, and accessibility for low-income individuals in the New York City Metro Area. It examines how socioeconomic, geographic, and financial factors affect transportation options and affordability in this area by looking at the data and publications, and by reviewing the literature on the topic. The importance of the work is that it is strongly connected to economic opportunity, fairness in society, and overall well being of low-income individuals. The results indicate that lower-income individuals are less likely to own vehicles, go in and out of car ownership more frequently, more likely to use public transportation than other income level earners, and had less transportation options and mobility. The suggested recommendations for policymakers in the New York City Metro Area include expanding eligibility for fare programs, improving bus and subway accessibility, and improving digital transit accessibility.

THANK YOU TO THE HONORS COUNCIL AND THESIS READERS

OUR MISSION

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

Design By: Gina Dige