

Barry University



18th ANNUAL

**Student
Research
Symposium**

April 10, 2026



18th Annual Student Research Symposium

This research symposium is aimed at engaging the Barry community in learning about and sharing in the excitement of ongoing discoveries and research within the Science, Technology, Engineering, and Math disciplines (S.T.E.M.), Medicine, Humanities and Social Sciences. Undergraduate, graduate and high school students will present posters related to their past and current research in biology, chemistry, computer science, sports and exercise science, health science, humanities, mathematics, music, medicine, social sciences, psychology, and physics.

Friday, April 10, 2026

9:00 - 11:45 am *Poster Presentations*

10:00 -10:30 am *Opening Ceremony*

Noon - 1:00 pm *Keynote Seminar*

1:00 - 2:00 pm *Award Ceremony*

We gratefully acknowledge:

The dedication of research mentors, support staff, undergraduate, graduate and high school student researchers.

Sigma Xi, The Scientific Research Honor Society for sponsoring
Dr. Teresa Petrino-Lin Memorial Award for Outstanding Student Presentation

Sponsors from Barry University: Department of Biology, Department of Math and Computer Sciences, Department of Chemistry and Physics, Department of Psychology, and The College of Health Professions & Medical Sciences

Special thanks for assisting with the Symposium to:
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Organized by Members of Barry University's STEM Committee:
Sabrina Des Rosiers PhD, James Haralambides PhD, Christoph Hengartner PhD,
Lubomir Markov PhD, Zacharias Papadakis PhD, Michael Robinson PhD,
Zuzana Zajickova PhD, and Anita Zavodska PhD

**Title: From Learning to Training:
How Experience Shapes Memory, Attention, and Performance**

Speaker: Justin Lauro, PhD
Assistant Professor of Psychology | Department of Psychology Barry University

Brief description of the talk:

Dr. Lauro presents a program of research examining how memory is shaped through experience, with a focus on language learning and attention. Drawing on work in psycholinguistics, he explores how variability across learning contexts supports the development of robust knowledge representations in the brain, particularly in bilingual learners. He then extends this framework to investigate whether these same principles can be used to enhance cognitive functioning. By combining approaches such as episodic specificity induction and physical activity, his research examines how attentional processes can be improved in real time. Together, this work highlights how understanding the mechanisms of learning can inform strategies to optimize performance across domains.

Keynote Speaker

Justin Lauro, PhD



Dr. Justin Lauro, Ph.D., is a cognitive psychologist and psycholinguist and Assistant Professor of Psychology at Barry University. He earned his Ph.D. in Psychology (Experimental) from the University of Texas at El Paso, with prior training at the University of Pittsburgh.

His research examines language, memory, and attention, with a focus on bilingual word learning and contextual influences on cognition. He uses multimethod experimental approaches integrating behavioral methods with biometric techniques particularly eye-tracking, to capture ocular indicators of real-time cognitive processing, such as attention and lexical activation.

His work is published in leading journals including *Journal of Memory and Language*, *Child Development*, and *Neuropsychologia*. Dr. Lauro is committed to faculty-mentored research. He has supervised several undergraduate and graduate projects, serving as thesis chair and committee member, and frequently co-authors presentations and publications with students. His mentorship has contributed to award-winning student research and scholarly engagement. In addition to his research and teaching, Dr. Lauro provides meaningful university service, including participation in the General Education Curriculum Committee and Faculty Senate, as well as professional service as a journal and National Science Foundation reviewer. Together, Dr. Lauro's work reflects commitment to advancing cognitive science and meaningfully engaging students in the research process.

DEPARTMENT OF BIOLOGY

1. Evaluating how Temperature Affects Lauric Acid's Antimicrobial Activity on *Staphylococcus epidermidis*

Sereen Akil, Dylan Barnes, Romina O'Brien, Alexis Hansen, Christoph Hengartner and Leticia Vega (Department of Biology, Barry University, Miami Shores, FL)

Staphylococcus epidermidis, a common Gram-positive skin bacterium, is the most frequent cause of medical device-related infections, primarily due to its robust biofilm-forming capabilities. Biofilms are structured microbial communities encased in a protective extracellular matrix that allows bacteria to better adhere to surfaces and colonize them. Biofilms also significantly increase bacterial resistance to environmental stressors, which can include antimicrobial agents such as antibiotics. Together, these biofilms properties increase the frequency of bacterial infections and make them harder to treat. Finding new treatments that inhibit biofilm formation is of great interest. Previous studies in our laboratory have shown that coconut oil inhibits cell growth and biofilm formation in two *S. epidermidis* strains examined: a strong biofilm-forming clinical isolate (RP62A), and a non-biofilm-forming strain (PCI 1200). We postulated that coconut oil's effect was mediated by the most abundant fatty acid in the mixture, lauric acid, a medium-chain fatty acid known to exhibit broad antimicrobial properties. In our assays, we confirmed that Lauric acid inhibits the growth of both strains of *S. epidermidis* in a dose-dependent manner at 37°C. Biofilm formation was also reduced by lauric acid. Quantitative plating suggests that cells exposed to the highest concentrations of lauric acid (250 micromolar) are still viable as they can form colonies after 24 hours. To examine this phenomenon further, we have examined the effects of temperature on lauric acid's antibacterial activity. Briefly, we have exposed standardized bacterial cultures of our two *S. epidermidis* strains (biofilm and non-biofilm producer) to varying concentrations of lauric acid at three different temperatures: 17°C, 27°C, and 37°C. The data we have obtained are presented here, and they will help clarify lauric acid's clinical potential for controlling bacterial growth and biofilm-related infections.

Supported by the Department of Biology at Barry University

2. Tracing evolution through genes: Annotation of the *SLC45A3* gene in the Puerto Rican parrot

Sereen Akil, Romina O'Brien, Jenny Yu, and Christoph Hengartner (Department of Biology, Barry University, Miami Shores, FL)

Charles Darwin was inspired by finches from the Galapagos Islands when he developed his ideas about natural selection, species formation, and evolution. Island ecosystems have continued to provide valuable model systems for studying evolutionary processes including migration, diversification, and extinction, as species often evolve independently due to their geographic separation. The endangered Puerto Rican parrot (*Amazona vittata*) is the only native parrot under United States jurisdiction, and one of the challenges of the captive breeding program is their weakened eggshell. Eggshell formation is a complex biological process influenced by multiple genetic and physiological pathways, yet the specific genes contributing to eggshell weakness in *A. vittata* remain largely unidentified. The parrot gene analyzed in this study was *SLC45A3*, and it encodes a membrane transport protein belonging to the solute carrier family. This protein family carries out cellular transport processes that may influence mineral deposition during eggshell formation. Using tools and methodology developed by the Genomics Education Partnership (GEP), we first used a reference sequence from *Gallus gallus* (chicken) to help identify the exon structure of the parrot ortholog. We determined the boundaries of the four coding exons of the parrot *SLC45A3* gene. After validating our gene model, we were able to predict the parrot protein sequence for *SLC45A3*. Multi-species protein alignments were performed to assess evolutionary differences between the Puerto Rican parrot (*A. vittata*), the chicken (*G. gallus*), and the parakeet (*Melopsittacus undulatus*). This comparative genomic analysis revealed high conservation of the predicted protein sequence, with eleven variations unique to *A. vittata*. Our work supports ongoing efforts to investigate the evolutionary and functional basis of traits relevant to eggshell integrity in the endangered Puerto Rican Parrot. It will be worth investigating if the amino acid changes in the *A. vittata* *SLC45A3* protein influence the parrot's impaired eggshell development.

The Genomics Education Partnership was supported by the National Science Foundation (Grant Nos. 1915544) and National Institute of General Medical Sciences of the National Institutes of Health (Award No: R25GM1305) and was hosted by the Department of Biological Sciences at The University of Alabama with continuing support from the Department of Biology at Washington University in St. Louis.

3. The allelopathic effect of garlic (*Allium sativum*) on the germination and growth of mustard seeds (*Brassica juncea*)

Kaitlin Allain, Katherine Villalobos, Cardji Calixte, Aaliya Gravesande-Singh, and Flona Redway (Department of Biology, Barry University, Miami Shores, FL)

While often recognized for its medicinal and culinary properties, garlic (*Allium sativum*) contains potent allelochemicals that can serve as natural inhibitors to the growth of competitive plant species. This study investigates the allelopathic potential of garlic on

the germination and development of mustard seeds (*Brassica juncea*), a fast-growing model organism. The objective was to observe how varying concentrations of garlic extract influence the growth rate of mustard seeds both during and after the initial germination phase. Seeds were germinated for three weeks. Plantlets will be introduced to different concentrations of aqueous garlic extract. Growth parameters, including root length and overall vitality, will be compared against a control group to determine the degree of inhibition or stimulation caused by the garlic concentrations.

Supported by the Department of Biology at Barry University

4. Monitoring benthic habitats in mangrove ecosystems

Hayley Boyle, Jesse Wiles, and Michael Robinson (Department of Biology, Barry University, Miami Shores, FL)

Assessing fish behavioral patterns in restored mangrove habitats is essential for evaluating ecosystem functionality, as these responses indicate whether restoration has successfully reestablished ecological processes that support fish communities. This study aimed to develop a low cost, durable, and easily deployable field camera system to assess mangrove fish communities, behavior, and ecosystem function across varying levels of human disturbance. We constructed a simple PVC camera mount to secure a GoPro 13 using zip ties, featuring an angled base for stable sediment insertion and top attachment holes. This was an effective and inexpensive design. We deployed cameras at Greynolds Park in North Miami, Florida for 60-minute intervals on a wide (16-34 mm) setting at three sites categorized by surrounding human activity as high, moderate, or low traffic. Fish abundance and behavioral responses were recorded and compared among sites. The system consistently captured fish abundance and behavior across all locations, demonstrating its reliability as a low-cost monitoring tool. Juvenile Creville jack *Caranx hippos*, were most frequently observed, commonly foraging near sediment and schooling at the surface. There was higher species richness at low and moderate traffic sites than the high traffic site. Continued monitoring is recommended.

Supported by the Department of Biology at Barry University

5. Effects of mycorrhizal fungi under different phosphorous levels on plant growth

Patraé Cartwright, Shereece Rennals, and Flona Redway (Department of Biology, Barry University, Miami Shores, FL)

Mycorrhizal fungi form symbiotic associations with plant roots and influence their growth, nutrient uptake, and overall productivity. In this relationship, fungal hyphae extend into the surrounding soil and increase the surface area available for nutrient absorption, particularly phosphorus, which is often a limiting nutrient in many terrestrial ecosystems. Through this interaction, plants gain improved access to soil nutrients and water, while the fungi receive carbohydrates produced through photosynthesis. Because phosphorus moves slowly through soil and is frequently unavailable to plants in sufficient amounts, mycorrhizal fungi play a critical role in improving phosphorus acquisition and plant growth. This study examines the effect of mycorrhizal fungi on growth of mustard seeds, *Brassica juncea*, under different phosphorus levels. Growth indicators including germination rate, shoot length, leaf number, and total biomass are measured to evaluate plant development. It is hypothesized that plants inoculated with mycorrhizal fungi demonstrate increased growth compared to those without fungal inoculation. Previous research shows that mycorrhizal fungi enhance plant nutrient uptake and contribute to improved plant performance when soil phosphorus availability is limited. Understanding these interactions highlights the ecological importance of plant-fungus mutualism and contributes to broader knowledge of nutrient cycling and plant productivity in terrestrial ecosystems.

Supported by the Department of Biology at Barry University

6. Muddled and muddy! The effects of mechanical bioturbation on gas exchange levels in Delaware salt marsh sediment

Ernest Charles¹, Aaron Carlisle², and Nicholas Ray² (¹Department of Biology, Barry University, Miami Shores, FL, ²School of Marine Science and Policy, University of Delaware, Lewes, DE)

Salt marshes sequester carbon and emit methane to the atmosphere. How these processes might be disrupted by physical disturbance is unclear. This study investigates the effects of mechanical bioturbation on emissions of carbon dioxide (CO) and methane (CH) from Delaware salt marsh sediments. Two controlled mesocosm experiments were conducted: one assessing varying disturbance frequencies (1, 3, and 6 events), and another evaluating the temporal recovery of gas flux post-disturbance. Sediment samples were analyzed using a Li-COR Trace Gas Analyzer, and flux rates were calculated based on chamber volume, slope, and the Ideal Gas Law. Results showed that bioturbation events consistently elevated both CO and CH emissions, with the greatest increase in CO flux from the highest disturbance treatment. CH emissions returned to near baseline within 12 hours of disturbance, while CO stabilized within 24 hours, indicating strong short-term resilience in salt marsh sediment gas dynamics. These findings support previous research on microbial self-regulation and provide

useful data for future studies. In particular, results could inform future research on large-scale bioturbation by marine megafauna, such as rays and horseshoe crabs, and their potential role in shaping GHG flux in coastal blue carbon ecosystems.

Supported by the Delaware Sea Grant National Science Foundation Research Experience for Undergraduates

7. Effects of salinity on red mangrove (*Rhizophora mangle*) propagule growth and survival

Andria Conliffe, Charissa Taylor, and Silvia Maciá (Department of Biology, Barry University, Miami Shores, FL)

Mangrove ecosystems play a vital role in our society, aiding in carbon sequestration, the protection of coastlines, the filtering of pollutants, and functioning as a nursery for juvenile marine life. Though these plants are euryhaline, their growth can nonetheless be affected by salinity. We investigated the effects of salinity on the growth of red mangrove (*Rhizophora mangle*) propagules. Three salinity treatments were tested - 0, 15, and 35 ppt, with three replicates each. Each replicate tank contained 11 propagules that were individually marked to aid in identification. The length and mass of each propagule were measured at two-week intervals over a 10-week period. Length and weight values of the 11 propagules were averaged for each tank. Both length and weight of propagules increased significantly with decreasing salinity. Based on these results, it can be inferred that red mangroves display optimal growth when in low salinity, rather than medium or high salinity treatments. Rising sea levels due to climate change are leading to increased saltwater intrusion in coastal areas. Our research suggests that this salinity stress may negatively affect mangrove propagule growth, and ultimately decrease the effectiveness of mangrove ecosystem services.

Supported by the Department of Biology at Barry University

8. Aquacultural effects of diet on growth rate in Cerith sand snails

Dicarlo Davis (Department of Biology, Barry University, Miami Shores, FL)

Marine snails are a prominent food source globally with many species involved in aquaculture. Cerith snails (*Cerithium caeruleum*) consume microalgae and detritus. Because of their small size and availability, Ceriths are good models of marine

gastropod aquaculture. However, little is known about the effects of diet on growth. We present here the initial results of a aquaculture study on the effects of common foods: Spirulina algal wafers, Calcium wafers, and standard fish pellets. Snails were fed four combinations of food every 1.5 weeks. Their mass and shell size were measured every few weeks. There was no apparent change in mass or size among the different food groups. Unlike the other treatment groups, snails fed the spirulina and calcium wafers regularly consumed all of their food. This suggests that the combination of spirulina and calcium wafers might be a preferred source of nutrition warranting a closer examination. Because even these small snails grow slowly, extending this study over a longer period of time will increase the likelihood of finding a significant effect. Hopefully this continued study will provide insight into the preferred food for optimal snail growth and increase the efficiency of aquaculture efforts.

Supported by the Department of Biology at Barry University

9. What are the effects of different frequencies on basil plants (*Ocimum basilicum*)?

Dana Elwan, Camila Dieguez, and Flona Redway (Department of Biology, Barry University, Miami Shores, FL)

Environmental factors such as light, water, and nutrients are well known to influence plant growth and development. However, factors such as sound frequencies and the effects of sound vibrations on plants receive less attention. Our project investigates the effects of different sound frequencies on the growth of basil plants (*Ocimum basilicum*). Basil seeds were germinated under standard conditions, by providing the seeds with light as well as watering them every day. Once germination occurred, seeds were exposed to 100Hz, 1,000Hz, and 8,000Hz respectively. A control group was also added in the same conditions without any sound exposure. Plants were exposed to these sounds for an hour every day for a week. Basil seeds will be further examined for growth changes throughout the experimental period. Understanding the effects of sound vibrations on plant growth, can contribute to developing alternative methods to enhance plant growth in controlled settings.

Supported by the Department of Biology at Barry University

10. I offered a limb, they took two: Limb loss induced locomotor strategies in the arboreal mangrove tree crab

Yesiana Herrera, Jynell George, and Janne Pfeiffenberger (Department of Biology, Barry University, Miami Shores, FL)

Mangrove tree crabs (*Aratus pisonii*) are arboreal decapods that rely on efficient locomotion for foraging and predator evasion in their complex habitats. Self-amputation of limbs is a common strategy found in several families to avoid predation. Multi-legged animals have redundant functionality in their limbs that can compensate for limb loss, yet the roles and functional importance of their limbs, as well as their compensatory ability are not fully understood. This study investigated how Mangrove tree crabs modify their climbing kinematics after limb loss, and how this loss affects their locomotor ability. Animals were recorded climbing after self-amputation of either the 1st, 2nd, 3rd, or 4th pair of limbs, and analyzed for stride length, stride frequency, velocity, and limb phase relationships. Climbing strategies varied after limb loss, resulting in orientation changes, and altered kinematics, such as shorter stride lengths and decreased stride frequency. The loss of the 1st and 4th pair of limbs had no effect, whereas the loss of the 2nd and 3rd pair of limbs affected the limb alignment and movement pattern, resulting in a larger range of motion of the limbs. Despite these kinematic shifts, overall, the climbing velocity was not significantly affected. Our findings demonstrate that *A. pisonii* have a locomotor system that can compensate for the loss of paired limbs through kinematics. Furthermore, there appears to be a functional specialization, with the medial limbs being necessary for propulsion and the 1st and 4th pairs serving a stabilizing and anti-topping function.

Supported by the Department of Biology at Barry University

11. Effects of cellulase and phosphorus fertilizer on the growth of *Phaseolus vulgaris*.

Martha McIntosh¹, Mikaila Montes-Robledo², and Aaliya Gravesande-Singh¹, and Flona Redway¹ (¹Department of Biology, Barry University, Miami Shores, FL, ²Department of Psychology, Barry University, Miami Shores, FL)

Plant growth is strongly influenced by nutrient availability and biochemical compounds present in soil. Cellulase can enhance plant growth by accelerating the decomposition of organic matter in soil, which increases nutrient availability and improves overall soil fertility. Phosphorus, an essential macronutrient, stimulates the development of robust root systems, accelerates plant maturity, strengthens stems, and enhances fruit or seed production. This study examines the effects of cellulase and phosphorus on the growth of *Phaseolus vulgaris* (kidney bean). All seeds were germinated in Petri dishes in the dark for one week and then transferred to biodegradable plant pots with organic indoor potting mix. The seedlings were exposed to treatments consisting of 0.1% cellulase, 0.1%

phosphorus fertilizer, and water-only control. Plant growth will be monitored over a four-week period, at which time root lengths and biomass will be measured. Growth will be evaluated each week by measuring plant height, leaf width, and leaf number.

Supported by the Department of Biology at Barry University

12. The effects of sodium chloride on the growth of *Phaseolus vulgaris*

Thierry Taylor, Aiden Losa, and Flona Redway (Department of Biology, Barry University, Miami Shores, FL)

Soil salinity is an important environmental factor that can influence plant growth and development. High concentrations of salt in soil can reduce a plant's ability to absorb water and essential nutrients, which may negatively affect growth. The purpose of this experiment was to investigate the effect of different concentrations of sodium chloride (NaCl) on plant growth. Understanding how salinity affects plants is important because increasing soil salinity from irrigation practices, coastal flooding and environmental changes can impact agricultural productivity and plant health. Kidney beans were germinated in Petri dishes and then carefully transplanted into soil and exposed to different salt treatments. The soil was kept consistently moist and plants were monitored over time to observe differences in growth and development. Plant growth will be evaluated by observing characteristics such as plant height, leaf development and overall plant health. It is expected that plants exposed to higher concentrations of sodium chloride will show slower growth and signs of stress compared to the control group. This study demonstrates how soil salinity can influence plant growth and highlights the importance of understanding environmental factors that affect plant development. The results of this experiment may help explain why high levels of salt in soil can reduce crop productivity and why managing soil salinity is important in agriculture and plant science.

Supported by the Department of Biology at Barry University

13. The effects of saltwater intrusion on crop plant growth

Ainsley Vanderhdye¹, Cardji Calixte¹, Jessica Erazo², Saniyah Bien-Aime¹, Neissa Rousseau¹, Alexandria Mohammed¹, Alanna Nelson-Weir¹, Isabella Koelkebeck¹, and Chanda Bwalya¹ (¹Department of Biology, Barry University, Miami Shores, FL, ²Department of Sociology & Criminology, Barry University, Miami Shores, FL)

Due to the ongoing climate crisis, sea levels are on a rise ultimately pushing saltwater further into our coasts. Additionally, saltwater can penetrate freshwater aquifers causing the water tables to also rise. Known as salt intrusion, this is causing effects from the drinking water in the aquifer to directly threatening agriculture crops. This study investigates the possible effects of salt intrusion on agricultural crops such as carrots, radishes, lettuce, and spinach. Four seeds were grown in peat pots with a continuous source of water. Six systems were used with three treatments with increasing salinity, 0 ppt, 3ppt, and 6ppt with two replicates each. The length of the plant, along with any qualitative data such as wilting, or color change was measured. The data collected will be used to assess how salinity may impact these plants early stages, therefore providing an insight to potential agricultural impacts due to salt intrusion.

Supported by the USDA National Institutes of Food and Agriculture, From Learning to Leading: Cultivating the Next Generation of Diverse Food and Agriculture Professionals (NEXTGEN) Program; award 2023-70440-40161

14. Influence of coastal habitat type on zooplankton community dynamics

Ainsley Vanderhyde, and Sabrina Gomez (Department of Biology, Barry University, Miami Shores, FL)

Marine ecosystems rely heavily on planktonic communities because they play a key role in nutrient cycling along with identifying as the base of most food webs. Depending on the habitat, the abundance and biodiversity of these planktonic communities can differ. In this study, the species richness and biodiversity of zooplankton communities from two habitats, manmade mangrove inlet, and rocky intertidal are examined. Using a plankton net, three tows were conducted in each site using standard collection methods and samples were preserved for identification and data collection. It was hypothesized that the rocky intertidal would have more species richness and biodiversity. The data collected will provide insight into patterns in each community based on habitat. This can provide a better understanding of how habitat variation can influence zooplankton community dynamics.

Supported by the Department of Biology at Barry University

15. Comparison of toothpaste and mouthwash effects on oral bacteria

Gianna Wallace, Laura Mudd, and Ana Lichtenberger (Department of Biology, Barry University, Miami Shores, FL)

Over 700 species of bacteria have been isolated, identified, and studied in the human oral microbiome (1,2). Some of the bacteria are relevant clinically as they are pathogenic (3). The aim of the study was to compare the bactericidal effects of several toothpastes and mouthwashes on oral aerobic and anaerobic bacteria. Bacteria were collected from two human subjects and maintained under aerobic and anaerobic conditions. Individual colonies were isolated and identified to the genus level by Gram stain, catalase test, coagulase test, and testing for glucose, lactose, and sucrose fermentation. Urea, gelatin, motility and microscopic testing were further used to identify bacteria. Test materials (toothpastes and mouthwashes) with 70% ethanol and water as positive and negative controls, were placed on discs over bacterial fields and returned to the incubator. The diameter of the bactericidal effect was measured in triplicate for each test. In this preliminary experiment Colgate and hydrogen peroxide were the most effective toothpaste and mouth rinse, respectively, for this limited bacterial sample.

Supported by the Department of Biology at Barry University

16. Effects of pH variation on Phaseolus vulgaris

Gianna Wallace, Alexandra Dimas, and Flona Redway (Department of Biology, Barry University, Miami Shores, FL)

Soil pH plays an important role in plant growth because it affects nutrient availability and the ability of roots to absorb water and minerals. Most plants grow best in soils with a pH between 6.0 and 7.5, where nutrients are readily accessible to plants. The purpose of this study was to examine the effects of pH on the growth of kidney beans, *Phaseolus vulgaris*, seedlings. Solutions of sodium hydroxide and vinegar were used to create basic and acidic conditions, respectively, while distilled water was the control. Kidney bean seeds were first placed in Petri dishes for germination until root growth was observed. The experiment was conducted in triplicate for each pH treatment. The seedlings were then transferred into pots with the same mass of soil and watered with their respective solutions. After four weeks, plant height, mass, and leaf and stem characteristics will be recorded and compared to evaluate the effects of different pH levels on plant growth.

Supported by the Department of Biology at Barry University

17. Assessing potential risks from WWII shipwrecks by filling knowledge gaps in NOAA's RULET database and simulating oil spill fate and transport

Ainsley Vanderhyde^{1,2}, Amy MacFadyen², and Rachael Mueller³ (¹Department of Biology, Barry University, Miami Shores, FL ², NOAA National Ocean Service Office of Response and Restoration, Seattle, WA, ³Genwest Inc, Seattle, WA)

The National Oceanic and Atmospheric Administration (NOAA) maintains a Resources and Undersea Threats (RUST) database, which identifies over 30,000 targets in U.S. waters. In 2010, Congress allotted \$1 million to identify ecologically and economically significant potentially polluting wrecks in this database for response contingency planning. This new database, the Remediation of Underwater Legacy Environmental Threats (RULET), developed a priority list of 87 wrecks for further monitoring. It utilized historical evidence, archaeological interpretation, and salvage engineering, combined with pollutant modeling, to quantitatively assess ecological and socio-economic risk from potential spills in a ranking matrix. Since the RULET database was developed in 2013, some of the vessels have been surveyed, eliciting new information relevant to the original risk ranking; this includes vessels that were determined to no longer contain oil, have undergone oil removal actions, and or have been identified as leaking based on satellite imagery analysis or survey observations. This project identifies wrecks with new information, summarizes those reports, and incorporates relevant information to develop an updated risk ranking. For the priority wrecks off the coast of Louisiana, additional fate and transport modeling was conducted utilizing the Northern Gulf of America Operational Forecast System. This high-resolution coastal ocean model has been operational since 2022. Using NOAA's oil spill model, GNOME (General NOAA Operational Modeling Environment), the effects of seasonality in shelf currents and river flow are examined with respect to regions potentially impacted by a worst case discharge from this vessel.

Supported by the National Oceanic and Atmospheric Administration Educational Partnership Program for Minority Serving Institutions (EPP) Undergraduate Scholarship Program

18. Urban agriculture and community health: experiential learning through the CRAFT Scholars Program

Shanice Akaloo¹, Alexandra Dimas², Brandon Seymour³, Lloy-Ann Stultz¹, Katherine Villalobos², Hannah Fox², D'Marion Ivey⁴, Shanaya Jean-Pierre¹, Romina O'Brien², Jenny Yu², and Roger Horne⁵ (¹Department of Chemistry & Physics, Barry University, Miami Shores, FL, ²Department of Biology, Barry University, Miami Shores, FL, ³Department

of Sociology & Criminology, Barry University, Miami Shores, FL, ⁴Department of Math & Computer Science, Barry University, Miami Shores, FL, ⁵No Department, Urban GreenWorks, Liberty City, FL)

Cultivating Resilience Through Agriculture and Food Training (CRAFT) is a program supported by a United States Department of Agriculture (USDA) National Institute of Food and Agriculture (NIFA) grant that provides scholarships and academic support to undergraduate students pursuing majors related to food science, nutrition and community health. The program introduces students to interdisciplinary approaches that connect fields such as biology, chemistry, sociology, criminology and computer science to address challenges related to food systems, environmental sustainability, and public health. Building upon the infrastructure established in Spring 2024 by the first cohort of 10 CRAFT Scholars, the second cohort of 20 CRAFT Scholars collaborated during the Spring 2025 semester at Urban GreenWorks (UGW) Cerasee Farm in Liberty City. While the first year focused on developing the farm's foundational structure, the second year emphasized sustainable agricultural practices and community-centered research. Students from various academic majors worked to enhance farm productivity and educational outreach through hands-on activities including soil health management through composting, construction of additional planting beds, and implementation of structured watering and maintenance schedules. In addition, scholars learned about the medicinal properties of plants, with a focus on the antioxidant and therapeutic benefits of leaves, herbs, and fruit-based teas, as well as the potential health benefits of high-fiber, nutrient-dense diets for improving community health outcomes. To complement this field work, students utilized a custom-developed app to study global and planetary health. Entrepreneurship modules used critical thinking frameworks to help students understand urban agriculture's role in creating sustainable economic opportunities in communities.

Supported by the USDA National Institute of Food and Agriculture, NEXTGEN Program, award 2023-70440- 40161

DEPARTMENT OF BIOMEDICAL SCIENCES

19. Sequence and structure-based analysis of the D213G variant of Carnitine palmitoyltransferase II

Eden Ben-Aharon, Ghali Kabbaj, Max Santos, and Ben Hitchinson (Department of Biomedical Sciences, Barry University, Miami Shores, FL)

Carnitine Palmitoyltransferase II (CPT II) is an inner mitochondrial membrane protein that is essential for the transport of fatty acids into the mitochondria as part of the

carnitine shuttle during fatty acid oxidation. CPT II specifically catalyzes the conversion of fatty-acyl carnitine to fatty-acyl-Coenzyme A (CoA), providing free carnitine for the carnitine shuttle and fatty-acyl-CoA for the generation of energy from fatty acid oxidation (FAO). Mutations in CPT II therefore seriously impact the ability of cells to use fatty acids as an energy reservoir, but many recently observed CPT II variants are poorly characterized. In our research, we studied the structural and functional effects of the recently discovered D213G mutation of CPT II found in a patient with CPT II deficiency. To address the effects of this mutation, amino acid sequences of CPT II from a range of evolutionarily distinct species were analyzed using multiple sequence alignment to evaluate the conservation of D213 as a proxy for functional significance, followed by a biochemical characterization of the structural consequences of the D to G mutation. We found that D213 is conserved within orthologs of CPT II, suggesting it is important for CPT II function. The substitution of the polar, negatively charged D for the small, uncharged G likely disrupts a hydrogen bonding network within the protein. This mutation is unlikely to completely eliminate the function of the protein, but during moments of high skeletal muscle activity where there is a need for energy from the FAO pathway, the effects of the deficiency of functional CPT II may begin to appear.

20. Sequence and structure-based analysis of the D213G variant of Carnitine palmitoyltransferase II

Carolyn Mas, and Ben Hitchinson (Department of Biomedical Sciences, Barry University, Miami Shores, FL)

Thiamine Transporter 1 (THTR1) is a high affinity transporter for the intake of Thiamine (Vitamin B1), an essential nutrient for helping the body convert carbohydrates into energy. Because THTR1 plays such an essential role in energy metabolism, mutations in THTR1 can lead to diseases, such as Thiamine-response megaloblastic anemia syndrome (TRMA). However, the effects of many recently discovered mutations of THTR1 are not well understood. This research aims to evaluate the clinically relevant TRMA variant G105E that was recently observed in patients with TRMA. Using sequence conservation analysis, structural mapping, and bioinformatic prediction tools, we determined that the G105 residue of the THTR1 protein is strikingly conserved among diverse vertebrate types (mammals, reptiles, birds, fish) suggesting the critical evolutionary role of THTR1 in cellular thiamine transport. Sequence alignment of THTR1 orthologs reveal strongly conserved hydrophobic regions near the C-terminus of the protein, which is consistent with a transmembrane segment. One such region, LLQG is especially conserved across terrestrial. The G105E mutation occurs within a helical transmembrane domain (residues 100-118) of the thiamine transporter THTR1 and replaces a highly conserved, achiral, and neutral Glycine in this sequence to a chiral, polar, and negatively charged Glutamic acid. Structurally, the introduction of a charged, hydrophilic side chain into the helical,

hydrophobic, transmembrane domain may disrupt the transporter THTR1's structure and impair Thiamine transport. These findings imply that mutations of THTR1 that disrupt this region may be clinically relevant, emphasizing the importance of combining evolutionary and structural analyses in variant interpretation.

21. Investigating the potential structural and functional impact of the D213G mutation in Carnitine palmitoyltransferase II

Mishaila McFadden, and Ben Hitchinson (Department of Biomedical Sciences, Barry University, Miami Shores, FL)

Carnitine palmitoyltransferase II (CPT2) is an inner mitochondrial membrane enzyme that facilitates long-chain fatty acid oxidation. CPT2 converts acylcarnitine into acyl-CoA, allowing fatty acids to be used as fuel via beta-oxidation. Mutations to the CPT2 gene often result in CPT2 deficiency, a metabolic disorder that can lead to hypoglycemia, muscle weakness and organ damage. Though many disease-causing variants have been identified, the functional consequences of many CPT2 mutations remain unknown. In this study, the recently discovered E174K missense variant of CPT2 was investigated to determine if amino acid residue E174K exists within a conserved region, and if mutation of this residue could have deleterious effects on protein structure and function. To address this question, a multiple sequence alignment of CPT2 orthologs across a range of taxa was examined to determine evolutionary conservation at position 174. Sequence analysis showed that several species retain glutamic acid (E) at site 174, while others contain neutral hydrophobic amino acids. None of the aligned species contain lysine (K) at this site suggesting the introduction of positively charged amino acids like lysine at position 174 may have significant consequences for protein structure. Specifically, analysis of the protein structure suggests that this mutation would likely disrupt hydrogen bonding and local structure interactions. Therefore, although the amino acid residue at site 174 is not highly conserved among several species, the site shows conservation of chemical properties indicating that the E174K variant may alter Carnitine palmitoyltransferase II function and structure.

22. Sequence and structure-based analysis of the S118L variant of the inward-rectifying potassium channel Kir2.1

Jochebed Oduro, and Ben Hitchinson (Department of Biomedical Sciences, Barry University, Miami Shores, FL)

The inward-rectifying potassium channel Kir2.1, encoded by the KCNJ2 gene, is a membrane protein that plays a critical role in maintaining the resting membrane potential of excitable cells. Proper Kir2.1 function is essential for normal electrical activity in cardiac and skeletal muscle, and mutations in KCNJ2 have been linked to disorders such as Andersen-Tawil syndrome and cardiac arrhythmias. Despite this clinical importance, the functional consequences of many KCNJ2 missense variants remain poorly understood. In this study, we investigated whether the S118L KCNJ2 variant occurs within an evolutionarily conserved region that may be important for channel function. To address this question, orthologous Kir2.1 protein sequences from ten vertebrate species were collected and analyzed. Multiple sequence alignment was performed using Clustal Omega to evaluate conservation of the S118 position affected by the variant. The analysis revealed that S118 is highly conserved across a range of vertebrate species, suggesting that this position may play an important structural or functional role in the potassium channel. Conservation of this residue across evolution indicates that substitutions at this site could potentially alter channel stability or potassium ion conduction. These findings suggest that variants located within conserved regions of KCNJ2 may have important functional consequences and highlight the value of evolutionary conservation analysis in interpreting genetic variants associated with disease.

23. Sequence and structure-based analysis of the R31W variant of the inwardly rectifying potassium channel Kir2.1

Dildorakhon Rasulova, and Ben Hitchinson (Department of Biomedical Sciences, Barry University, Miami Shores, FL)

The inwardly rectifying potassium channel Kir2.1 is a transmembrane potassium ion channel that regulates potassium ion movement across the plasma membrane and stabilizes the negative resting membrane potential in excitable cells. Kir2.1 plays a critical role in the repolarization of cardiomyocytes and in maintaining electrical stability in tissues such as cardiac muscle, skeletal muscle, and neurons. Despite its physiological importance, the functional consequences of many Kir2.1 mutations remain incompletely understood. In this study, we investigated the structural and functional significance of the disease-associated Kir2.1 variant R31W. To address this question, sequence alignment across species, structural modeling, and published functional studies were used to examine the conservation and structural location of residue R31. Conserved residues were mapped onto a predicted three-dimensional structure of Kir2.1 to determine their relationship to functional regions involved in channel gating and trafficking. Sequence alignment analysis revealed that residue R31 is highly conserved among vertebrate Kir2.1 orthologs, suggesting an important role in channel structure or regulation. Structural analysis indicates that substitution of arginine with

tryptophan at this position may disrupt normal protein interactions or channel folding due to differences in charge and polarity between these residues. Such alterations are predicted to impair channel trafficking or function, reducing potassium conductance across the membrane. These findings suggest that the R31W mutation may contribute to perturbed protein function and disease, and highlight the value of evolutionary and structural analyses in understanding ion channel disease mechanisms.

24. Sequence and structure-based analysis of the N222S variant of the Glycogen Branching Enzyme 1

Hailey Ribeiro, and Ben Hitchinson (Department of Biomedical Sciences, Barry University, Miami Shores, FL)

Glycogen Branching Enzyme 1 (GBE1) is a cytosolic glycosyltransferase that catalyzes the formation of alpha-1,6 glycosidic branches in growing glycogen chains during glycogen biosynthesis. These branches are essential for maintaining glycogen solubility, its compact structure, and the rapid mobilization of glucose during cellular energy demand. Impaired GBE1 function disrupts normal glycogen structure and leads to the accumulation of poorly branched glycogen polymers associated with diseases such as Glycogen Storage Disease type IV and Adult Polyglucosan Body Disease. Despite the known consequences of GBE1 deficiency, the functional significance of several missense variants, including the N222S substitution, remains unclear. In this study, we investigated whether the N222S variant occurs within a conserved region of the GBE1 protein that may be important for enzymatic activity. To address this question, amino acid sequences of GBE1 from multiple species were analyzed using multiple sequence alignment to evaluate evolutionary conservation. The analysis revealed that the region surrounding residue 222 is highly conserved among vertebrate orthologs, suggesting that this position may play an important role in protein structure or function. These findings highlight the usefulness of conservation analysis for evaluating variants of uncertain significance and provide a basis for future functional studies of GBE1 mutations.

25. Sequence and structure-based analysis of the G278R variant of the human pyruvate dehydrogenase E1 component

Victoria Wilson-Thompson, and Ben Hitchinson (Department of Biomedical Sciences, Barry University, Miami Shores, FL)

Human pyruvate dehydrogenase E1 component (E1P) is a mitochondrial thiamine-diphosphate dependent oxidoreductase protein that is a part of the pyruvate dehydrogenase complex. E1P catalyzes the conversion of pyruvate into acetyl-CoA for entry into central energy metabolism. Conversion of pyruvate into acetyl-Coa is essential for the generation of ATP from carbohydrates. As such, mutations in E1P can impair cellular metabolism and contribute to various metabolic dysfunctions. This study aims to examine the structural and functional consequence of the recently discovered G278R variant of E1P, which was identified in a patient with pyruvate dehydrogenase deficiency. To address the importance of this mutation, we investigated whether the G278 residue is conserved across a range of E1P evolutionary orthologs, and examined the structure of human E1P to determine the potential consequences of the G278R mutation. To address this question, amino acid sequences of E1P from multiple species were analyzed using multiple sequence alignment to evaluate evolutionary conservation. We then analyzed the crystal structure of human E1P to determine the potential structural impact of the mutation. This study highlights the usefulness of bioinformatics approaches and conservation analysis for evaluating variants of uncertain significance and provides a basis for future functional studies of E1P.

DEPARTMENT OF CHEMISTRY & PHYSICS

26. Beyond the Standard Model: Searching for new particles with gravitational waves

Yosthinn Cuitiva, Maria Sofia Ortega, and Bartosz Fornal (Department of Chemistry & Physics, Barry University, Miami Shores, FL)

In the Standard Model of particle physics, there are many questions still left unanswered, such as the origin of the matter-antimatter asymmetry of the Universe, the nature of dark matter, or the mechanism behind neutrino masses. We propose a new theory extending the Standard Model symmetry structure by an extra SU(2) gauge group and containing extra particles. We then demonstrate that this model leads to the production of primordial gravitational waves in the early Universe through first order phase transitions and domain wall annihilation. The signals we predict can be searched for in gravitational wave experiments, such as the currently operating LIGO detector and the near-future LISA space interferometer.

27. Rhodium-catalyzed regioselective hydrosilylation of styrene derivatives

Yosthinn Cuitiva, Marco Calla and Niroshani Abeynayake (Department of Chemistry & Physics, Barry University, Miami Shores, FL)

Alkenes are important starting materials in organic chemistry, and their controlled functionalization is a central objective in catalysis. One useful transformation is hydrosilylation, in which a silicon-hydrogen bond adds across a carbon-carbon double bond to form alkylsilanes. Hydrosilylation has emerged as one of the most successful catalytic transformations in industrial organic chemistry. silicone industry and serve as important precursors in the synthesis of pharmaceuticals and organosilicon polymers. In this study, we investigate the hydrosilylation of styrene derivatives using $\text{Rh}_2(\text{OAc})_4$ as a catalyst under reflux conditions, with tertiary silanes. A major challenge in hydrosilylation reactions is controlling regioselectivity, which determines the position at which the silicon group adds to the alkene. Although many catalytic systems favor the formation of anti-Markovnikov products, achieving high selectivity remains an important goal. Here, we examine the catalytic activity of $\text{Rh}_2(\text{OAc})_4$ in the hydrosilylation of aromatic alkenes and evaluate its effectiveness in promoting the selective formation of the desired products.

Supported by the Department of Chemistry & Physics

28. Di-substituted porphyrins give insights about mechanochemical porphyrin synthesis mechanism

Mia Gregorio, and Tamara Hamilton (Department of Chemistry & Physics, Barry University, Miami Shores, FL)

Porphyrins are an important component of lots of major biochemical processes and reactions. In nature, compounds in the porphyrin family are vital due to their ability to coordinate metal ions which allow them to play key roles in metabolism, oxygen transport and help in biochemical reactions. Porphyrins can be synthesized by the condensation of equimolar amounts of pyrrole and aldehyde catalyzed by an acid. This forms an intermediate, porphyrinogen, that then is oxidized to yield the aromatic product. Mechanochemistry is a growing field that represents the greener side of Chemistry, where the focus is to use sustainable methods to initiate chemical reactions. It provides an eco-friendly alternative to solution-based synthesis due to an ability to replace the use of solvents. This ultimately leads to a reduction in waste production. In this research, we investigate how porphyrins can be synthesized using mechanochemistry. Previous work from the Hamilton group has successfully shown that tetra-meso-substituted porphyrins can be produced in similar yields to their yields in solution. In this work, we are investigating the less symmetrical di-meso-substituted porphyrins. Scrambling is a known concept in solution-based syntheses of di-meso-substituted porphyrins. Acid-catalyzed condensation of a dipyrromethane with an aldehyde can lead to a “*trans-like*”; or a “*cis-like*”; di-meso-substituted porphyrin product. In landmark studies conducted in solution by Lindsey et al., conditions

that promote and suppress scrambling in porphyrins were identified. Guided by this approach, we aim to understand whether scrambling occurs or not under the same conditions mechanochemically. 5-phenyl-dipyrromethane and 5-mesityl-dipyrromethane were each reacted with p-tolualdehyde to give the corresponding di-meso-substituted porphyrins. Reactions took place in a ball mill using equal amounts of the dipyrromethene and aldehyde with 5% acid catalyst. Reaction mixtures were then oxidized using 2,3-dichloro-5,6-dicyano-1,4-benzoquinone (DDQ) in a minimal amount of chloroform and purified using alumina and silica. Products were characterized using thin layer chromatography (TLC), proton nuclear magnetic resonance ($^1\text{H-NMR}$), Ultraviolet-Visible (UV-Vis) spectroscopy, and Laser Desorption Ionization Mass Spectrometry (LDI-MS). Comprehension of scrambling in a mechanochemical medium will give information about the mechanism of organic reactions that take place by mechanochemistry.

Supported by the Department of Chemistry & Physics

29. Engineering soluble human ido2 constructs for biochemical and structural characterization

*Priscila Salazar, Caitlin Clarke, Gideon Adams, Faiyaz Mahmud, and Khoa Pham
(Department of Chemistry & Physics, Barry University, Miami Shores, FL)*

Human indoleamine 2,3-dioxygenase 2 (hIDO2) is one of three enzymes that catalyze the first and rate-limiting step of tryptophan metabolism in the kynurenine pathway. Dysregulation of these enzymes has been associated with tumor immune evasion and chronic inflammatory diseases. While the biochemical properties and structures of human indoleamine 2,3-dioxygenase 1 (hIDO1) and tryptophan 2,3-dioxygenase (TDO) have been extensively characterized, the structural and functional roles of hIDO2 remain poorly understood mainly due to challenges in recombinant expression and poor protein solubility. In this study, structure-guided computational analysis was used to identify intrinsically disordered and aggregation-prone regions within hIDO2. Based on these predictions, four engineered plasmid constructs were designed to improve protein solubility and stability, including truncation variants and mutations targeting predicted hydrophobic regions. Ongoing work focuses on cloning, expression screening, and purification to evaluate solubility and folding of these constructs. Establishing soluble recombinant hIDO2 will enable future biochemical and structural studies.

30. Feasibility of preparing an organo-silica hybrid monolith via photoinitiated thiol-methacrylate polymerization

Lloy-Ann Stultz, and Zuzana Zajickova (Department of Chemistry & Physics, Barry University, Miami Shores, FL)

Monolithic stationary phases have gained increasing attention for their applications in separation science, particularly in capillary liquid chromatography, due to their high permeability and rapid preparation. This study aims to contribute to the development of organo-silica hybrid monoliths using 3-mercaptopropyltrimethoxysilane (MPTMS) as the starting reagent and toluene as the porogenic solvent. To evaluate the feasibility of thiol-methacrylate photopolymerization, UV-Vis spectroscopy was used to measure the UV absorption spectra of several commonly used photoinitiators and thiol cross-linkers involved in monolith preparation. Photoinitiators examined included 2,2-dimethoxy-2-phenylacetophenone (DMPA), IRGACURE 819, benzophenone (BP), and azobisisobutyronitrile (AIBN) alongside thiol cross-linking agents such as pentaerythritol tetrakis(3-mercaptopropionate) (PTM), ethylene dithiol (EDDT), and trimethylolpropane trimercaptopropionate (TPTM). Spectroscopic measurements were performed using both vapor- and solution-phase approaches, depending on compound volatility. The spectral data were analyzed to assess light absorption characteristics and the suitability of each initiator for UV-initiated polymerization. The results provide guidance for selecting effective photoinitiator-cross-linker systems for organo-silica hybrid monolith preparation.

Supported by the Department of Chemistry & Physics

DEPARTMENT OF CLINICAL BIOLOGY

31. Emerging therapeutic option: dalbavancin activity against *Corynebacterium striatum* from bone and joint infections

Rebecca Stevens, Aiyannah Commodore, Eric Carey, and Inshan Ali (Department of Clinical Biology, Barry University, Miami Shores, FL)

Corynebacterium striatum has increasingly been recognized as an opportunistic pathogen in bone and joint infections, particularly in patients with prosthetic joints, orthopedic hardware, or prolonged hospitalization. Treatment can be challenging due to the organism's ability to form biofilms and its frequent multidrug resistance, often leaving broad spectrum glycopeptide antibiotics such as vancomycin as the primary therapeutic option. Dalbavancin, a long-acting lipoglycopeptide with potent activity against Gram-positive organisms and favorable bone penetration, may represent

a promising alternative; however, limited data exist regarding its activity against *C. striatum*. Clinical isolates of *C. striatum* were identified using matrix-assisted laser desorption ionization-time of flight mass spectrometry (MALDI-TOF MS). Minimum inhibitory concentrations (MICs) for dalbavancin were determined using gradient diffusion strips on Mueller-Hinton agar supplemented with 5% sheep blood, following Clinical and Laboratory Standards Institute (CLSI) recommendations. Dalbavancin demonstrated strong in vitro activity against the tested isolates, with most MIC values $\leq 0.25 \mu\text{g/mL}$. These findings suggest dalbavancin may represent a promising therapeutic option for the management of bone and joint infections caused by multidrug-resistant *C. striatum*.

DEPARTMENT OF MATH & COMPUTER SCIENCE

32. Gold price prediction

*Adam Lynch*¹, *Mathew Cole*¹, *Roberto Campoverde*², and *James Haralambides*¹
(¹Department of Math & Computer Science, Barry University, Miami Shores, FL,
²Department of Finance, Barry University, Miami Shores, FL)

We developed a specialized price predictor tool for the commodity Gold. We scraped the financial data from Yahoo Finance API, which included daily metrics for opening price, closing price, maximum price, minimum price, and trading volume. Our primary objective was to leverage the historical data of past days, weeks, and months, to predict the closing price on the subsequent day. We employed a walk-forward validation strategy. In our primary window, the model was trained on data up to a certain day and was then asked to predict the closing price of that day. The actual closing price of that day was added to the training data, the model was retrained, and the following day was predicted. We added calculated columns such as EMA indicators, Relative Strength Indices, and Bollinger bands, to build an even more robust model. To avoid encountering the issue of persistence, we took out the price indicators that reflected the actual price data and only included trend data. We also tested the addition of relative assets like the S&P 500 and the US dollar. Using Gradient Boosting Regressor as the model, we tested our predictive tool in two distinct economic cycles: the bull market of 2024 and the Bear market of 2013. In the bull market, our model performed effectively the same as the market, while taking 4% less risk than the market. In the crash, our model lost 33 percent less than the market, effectively mitigating the losses.

33. A multi-model framework for forecasting and clustering financial assets using supervised and unsupervised machine learning

Aftab Masjidi, and James Haralambides (Department of Math & Computer Science, Barry University, Miami Shores, FL)

Financial time series exhibit highly non-stationary and noisy dynamics, making reliable forecasting challenging for many machine learning models. Predictive systems that perform well during training frequently degrade under distribution shift, regime changes, and volatility shocks. This research investigates the robustness of multiple machine learning architectures for forecasting and structural analysis across heterogeneous financial assets. A unified experimental framework was developed to evaluate both supervised and unsupervised learning approaches across thirteen assets spanning major market sectors, including index ETFs, technology equities, financial institutions, energy companies, and commodities. Supervised forecasting models include Ridge Regression, Support Vector Regression, Random Forests, Multilayer Perceptrons, Long Short-Term Memory Networks, Convolutional Neural Networks, and hybrid CNN-LSTM architectures. Models were evaluated under multiple preprocessing strategies to assess the sensitivity of model performance to feature normalization. Experiments were conducted using five years of daily OHLCV market data obtained through the yfinance API. Model performance was assessed using standard regression metrics including RMSE, MAE, and R²; to explicitly capture performance degradation under distributional drift. Results show that classical linear models, particularly Ridge Regression, consistently demonstrate stronger stability and generalization under regime shifts compared to deep neural architectures. While deep models achieved lower training loss, they frequently exhibited significant degradation during periods of market volatility. Unsupervised representation learning methods revealed clear clustering patterns separating commodities, technology equities, and financial assets. These findings highlight the importance of robustness-aware modeling in non-stationary environments and provide insights applicable to anomaly detection systems in cybersecurity and financial risk modeling.

34. Weather forecasting: Rain prediction

Kimberly Miranda, Gaia Riedmueller, Lola Umarova, and James Haralambides (Department of Math & Computer Science, Barry University, Miami Shores, FL)

Our research focuses on rain prediction forecasting throughout a number of cities in the United States. In our analysis we explore machine learning techniques to weather forecasting by predicting weather probability of rainfall across various cities throughout the United States using various techniques. As climate change continues

to intensify weather variability, accurate precipitation forecasting has become increasingly important for public safety, agriculture, transportation, and urban planning. The analytical component of this project centers on developing and evaluating two neural network-based models: an MLPClassifier to predict the likelihood of rainfall and an MLPRegressor to estimate the expected precipitation amount in millimeters. Historical weather data were collected, cleaned, and processed to train both models for multiple cities. For each location, the classifier produced binary rain predictions, while the regressor generated continuous precipitation estimates. Model performance was assessed using accuracy metrics for classification and regression scores for precipitation amounts. The results for all cities were compiled into a unified summary Data Frame containing predicted rainfall frequency, model accuracy, predicted precipitation levels, and regression performance. This structure enabled clear cross city comparisons and supported the creation of visualizations such as scatterplots and bar charts to highlight spatial trends and model behavior. Overall, the project demonstrates how machine learning can support localized weather forecasting and provide interpretable insights into rainfall variability across the United States. The workflow also illustrates the value of combining classification and regression models to capture both the occurrence and intensity of precipitation events.

35. Demographic dynamics: Data modeling and predictive analysis

*Jose Perez Navarro, Emmanuel Altine, Romar Reid, and James Haralambides
(Department of Math & Computer Science, Barry University, Miami Shores, FL)*

This project analyzes long run demographic dynamics by constructing a cleaned, multi country panel dataset and applying machine learning models to predict population trends, with Haiti examined as a special case. Four World Bank indicators – population, fertility rate, life expectancy, and GDP – were imported, reshaped, merged, and rigorously filtered to remove aggregates and countries lacking sufficient historical coverage. Enforcing a minimum of 54 yearly observations per country produced a balanced panel suitable for timeseries modeling and cross-country comparison. Three supervised learning models – Linear Regression, Decision Tree, and Random Forest – were evaluated using an Origin-based timeseries cross validation framework. All models achieved strong predictive accuracy, with cross validated values above 0.93. The Decision Tree performed best overall, showing minimal train-and-test divergence, the lowest mean squared error, and excellent generalization on a final holdout test set. Feature importance analysis showed that country-specific structural characteristics, captured through one hot encoding, dominated predictive power across models. A second experiment introduced lagged population features to assess genuine forecasting ability. Results demonstrated that past population levels are the strongest predictors of future trends, and that tree-based methods can effectively

model long-term demographic dynamics. Haiti's trajectory illustrates these findings. Despite political instability, migration pressures, natural disasters, and insecurity, Haiti's population continued to grow, though at a slowing rate – particularly after 2010 and again between 2021 and 2023. The models captured these shifts as gradual decelerations rather than abrupt demographic breaks, reinforcing the stability of long run population dynamics even under significant sociopolitical stress.

DEPARTMENT OF PUBLIC HEALTH

36. Legislative immunities: a comparative policy analysis of Medicaid expansion and COVID-19 health outcomes

Imani McClammy (Department of Public Health, Barry University, Miami Shores, FL)

Learning Objective: Analyze the comparative impact of state-level Medicaid expansion policies on COVID-19 mortality and uninsurance rates to formulate evidence-based recommendations for closing legislative coverage gaps. Background: The COVID-19 pandemic revealed deep fractures caused by fragmented state-level policies. While the Families First Coronavirus Response Act provided temporary relief, the structural decision by 10 states to reject ACA Medicaid expansion created a “natural experiment” in health equity. This study posits that legislative inaction in non-expansion states functioned as a social determinant of health, exacerbating vulnerability during the crisis. Objectives: To evaluate whether Medicaid expansion states demonstrated greater resilience against COVID-19-related uninsurance and mortality compared to non-expansion states, and to assess expansion as a policy mechanism for mitigating racial and economic disparities. Methods: A systematic literature review and comparative policy analysis synthesized peer-reviewed articles and legislative data (PubMed, Google Scholar, KFF; 2020–2024). Quantitative outcomes—mortality rates, uninsurance volatility, and racial disparity indices—were compared between the 41 expansion states (including D.C.) and the 10 non-expansion states. Results: Expansion states acted as critical stabilizers. Non-expansion states experienced significantly higher mortality volatility; in 2021, mortality rates surged to 81.9 per 100,000 compared to 49.0 in expansion states. Economically, COVID-related job loss in non-expansion states was associated with a 16-percentage point increase in uninsurance, double the 8-percentage point increase observed in expansion states. Minority populations in non-expansion jurisdictions faced compounded risks, with higher uninsurance driving widened disparities in hospitalization and death. Conclusion: Medicaid expansion is a fundamental component of pandemic preparedness. The refusal to expand created avoidable structural barriers that statistically worsened health outcomes and financial security for low-income populations. Public Health Implications: Current incentives like ARPA are insufficient to bridge coverage gaps. Policymakers must advocate for federal

mandates or “automatic stabilizer” policies that decouple healthcare access from state political discretion, ensuring a unified national defense against future public health emergencies.

DEPARTMENT OF SOCIOLOGY & CRIMINOLOGY

37. Casa Pueblo, a model of community led sustainability

Kayla Whitty¹, Megan Woods², Beatriz Sosa Gonzalez², Kaitlyn Velasquez², Celine Hernandez², David Narcisse¹, Yesiana Herrera², and Christoph Hengartner²
(¹Department of Sociology & Criminology, Barry University, Miami Shores, FL,
²Department of Biology, Barry University, Miami Shores, FL)

Puerto Rico, a US territory, is a living laboratory for agriculture and biodiversity. The island’s unique mix of tropical ecology, colonial history, and modern sustainable farming practices makes it an ideal location to study how global forces impact local environments and communities. In Spring 2026, Craft Scholars traveled to Puerto Rico for a 6-day immersive trip to learn about the island’s agriculture and natural resources. Faculty and students from the Institute for Innovation in Sustainability Training, Applications and Research in Agri-Environmental Sciences (IINSTAR-AS) at the University of Puerto Rico, Rio Piedras, served as facilitators during the trip. Both projects, CRAFT and IINSTAR-AS, are part of the USDA NextGen program, a workforce development grant that aims to educate students in agriculture, food, and natural resources. As part of this experience, students visited Casa Pueblo, a community self-management project committed to empowering communities to protect natural, cultural, and human resources in Adjuntas, Puerto Rico. Casa Pueblo was founded in 1980 through community-led movements to halt the Puerto Rican government’s open-pit mining operations for heavy and precious metals, including copper, silver and gold, in the area. If allowed, the mining would have had catastrophic environmental impacts throughout the island. CRAFT Scholars were able to speak and hear from one of the founding members, Mr. Alexis Massol-González, and hear first-hand how the creation of Casa Pueblo came about. Casa Pueblo works with the community to provide sustainable energy, resources, and agricultural education. Their work led to the creation of the Biological Corridors and the Bosque del Pueblo (Forest School). The goal of this project is to reflect on the experience of visiting Casa Pueblo, learning about their solar energy initiative, radio station, and Forest School, and to understand how this town’s efforts have helped the community through their continued mission of sustainability. Through this experience, students gained an understanding of both the importance of community involvement and environmental protection.

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DEPARTMENT OF PSYCHOLOGY

38. Emotional Labeling in Emerging Adulthood: A Norming Study of Scenario-Based Stimuli

Bathesheba Auguste, Sabrina Des Rosiers, Guillermo Wated (Department of Psychology, Barry University, Miami Shores, FL)

Emerging adulthood (ages 18–29) is characterized by heightened identity exploration, instability, and emotional complexity (Arnett, 2000, 2023). Within this context, Gross’s process model of emotion regulation (1998) conceptualizes emotion regulation as patterns of management, adjustment and expression of emotional experience which occur across contextually embedded situations (Gross, 2024). One emotion regulatory pattern is cognitive reappraisal, the process of reinterpreting a situation to modify emotional experience. Within this framework, ecologically valid stimuli accurately capture real-world emotional demands as they provide information about the individual emotional experience (Khazaei et al., 2026). Scenario-based approaches that represent the diversity of contexts that elicit emotions are frequently used to study emotion regulatory processes (e.g., Chaudri, 2025). In general, methodological studies have suggested that such stimuli must be systematically normed to describe whether the scenarios are emotionally meaningful and developmentally appropriate prior to adopting them for randomized preventative interventions (e.g., Baguley et al., 2022). The present study aims to norm a set of 10 college-relevant scenarios across academic, social, cultural, personal, and financial domains to establish their suitability for use in a randomized preventative intervention on cognitive reappraisal in college students. Participants (N = 60) will include undergraduate students ages 18–29 recruited from a university population. An anonymous online survey design approach will be undertaken to collect data on participants’ demographic as well characteristics of 10 scenario prompts. For each scenario, participants will: (a) generate open-ended emotion labels, (b) select a likely behavioral response, (c) endorse a follow-up response option, (d) rate emotional intensity and valence (positive-negative). Participants’ open-ended emotion responses will be coded into discrete emotion categories (e.g., anger, disgust, fear, happiness, sadness, embarrassment, shame). A dominance rule will be applied such that the primary emotion is defined as the first or most salient emotion listed and co-occurring opposing emotions will be coded as mixed and non-emotional responses will be coded as neutral. Emotions will be further classified by emotion category (basic/primary; self-conscious/secondary), valence (positive, negative) and arousal (high vs. low), consistent with dimensional models of affect (Baudouin et al., 2025; Cowen et al., 2019; Ekman & Cordaro, 2011). The following research questions will be explored: (1) Which emotion labels are most frequently elicited by each scenario? (2) do scenarios differ in dominant emotion category, valence, and arousal? (3) Do emotional intensity ratings vary across scenario domains? Analyses will include descriptive statistics to characterize frequency of emotion labels, emotion categories, arousal, valence and

mean levels of intensity ratings. Chi-square tests of independence will evaluate whether a difference in count/frequencies is observed between scenario and emotion category as well as scenario and emotion valence. One-way analysis of variance (ANOVA) will assess differences in mean intensity ratings across scenario domains. These analytic strategies are consistent with previous norming studies and will inform whether scenarios are developmentally appropriate for emerging adults in college. Furthermore, this norming study is meaningful because it seeks to establish the empirical foundation necessary for including the scenarios in a randomized preventative intervention on cognitive reappraisal in emerging adults in college consistent with Gross's process model of emotion regulation.

39. Effects of Episodic Specificity Induction on Decision-Making in the Iowa Gambling Task

Marina Azevedo, Natalya Guerrero, Adrienne Saunders, and Justin Lauro (Department of Psychology, Barry University, Miami Shores, FL)

Episodic Specificity Induction (ESI) is a brief cognitive training procedure designed to enhance episodic retrieval processes by encouraging individuals to recall detailed aspects of past experiences. Because episodic memory contributes to future-oriented thinking and decision-making, ESI may influence performance on tasks that require evaluating uncertain outcomes. The present study examined whether ESI affects decision-making performance on the Iowa Gambling Task (IGT) in a sample of college students. Participants complete both an ESI condition and a control condition in a within-subjects design, with the order of conditions counterbalanced across participants. In each condition, participants complete the IGT before and after the intervention. Reaction time during decision-making trials serves as the primary outcome measure, with additional analyses examining trial-level changes in performance across the task. It was predicted that participants will exhibit greater improvements in decision-making efficiency (i.e., faster reaction times) from pre- to post-test following the ESI condition relative to the control condition

40. Do Emotional Intelligence domains differentially associated with AI-giarism in college students?

Jannet Franco-Almanza, Sabrina Des Rosiers, Guillermo Wated (Department of Psychology, Barry University, Miami Shores, FL)

Emotional Intelligence (EI) refers to the ability to recognize, understand, and manage one's emotions and the emotions of others. It includes skills such as self-regulation, empathy, motivation, and interpersonal functioning. While everyone possesses some level of EI, individuals differ in how effectively they access those domains to sustain healthy psychological functioning. In research, EI is conceptualized in three models: the ability model, which defines EI as a set of learnable skills; the trait model, which views EI as stable and inherent characteristics; and the mixed model, which combines both perspectives. Higher EI has been associated with stronger communication, decision-making, stress management, and overall well-being. Individuals with higher levels of EI are better able to resolve conflicts, maintain positive relationships and effectively meet the challenges and demands of everyday life, including emerging adults in college overcoming emotional, social and academic demands. As access to Artificial Intelligence (AI) technology increases, concerns have emerged regarding students' reliance on AI in unethical ways to meet academic demands. AI-giarism is a new construct that refers to claiming work generated by an AI tool as one's own (e.g., Khalaf, 2025). Emerging research suggests that individual differences in psychological functioning are related to AI use, such that distinct psychological patterns may be associated with different ways of engaging with AI. For example, Pearson and colleagues (2026) found that AI information guidance, attitudes (favorable vs. unfavorable), and degree of trust in AI were differentially associated with judgment, cognitive bias, and decision-making about AI-generated information. Additionally, recent work examining students' perceptions of AI-assisted plagiarism indicates variability in how students define and evaluate AI-generated academic misconduct (Chan, 2025). Given the widespread use of AI tools, a growing body of literature seeks to examine individual differences in psychological functioning in relation to AI use. To that end, the present study seeks to explore the relationship between emotional intelligence and the misuse of artificial intelligence in academic contexts. This study will employ a correlational survey design to recruit emerging adults between the ages of 18-29. Participants will complete a demographic questionnaire including gender, age, race/ethnicity, grade status, and educational level. Emotional intelligence will be measured using the Trait Emotional Intelligence Questionnaire-Adolescent Short Form (TEIQue-ASF; Petrides et al., 2006), a 30-item measure assessing emotion regulation, emotional awareness, empathy, and social skills. Items are rated on a 7-point Likert scale ranging from 1 (disagree) to 7 (agree), with higher scores indicating higher levels of emotional intelligence. Participants' views and engagement in AI dependency and AI-related plagiarism will be measured using the AI-Giarism scale, which assesses the extent to which individuals agree or disagree specific AI-related behaviors constitute academic misconduct (Chan, 2025). The scale uses a 5-point Likert scale ranging from 0 (disagree) to 5 (agree). An example item is: "The student input a prompt into an AI system, copied the generated response, and submitted it to the teacher." Higher scores indicate greater endorsement of AI-giarism. To assess relationships between emotional intelligence domains and AI-giarism, a multiple regression analytic approach will be employed. Prior to conducting regression analyses, internal consistency will

be evaluated for all measures, and descriptive statistics will be computed for all study variables. The exploration of the association between emotional intelligence and AI-giarism has the potential to advance understanding regarding the relationship between psychological functioning and ethical or unethical AI use among emerging adults who are in college. Findings may inform the development of targeted educational and intervention strategies aimed at promoting adaptive emotional functioning that might inform responsible engagement with AI technologies in academic settings.

41. Exploring the Association Between Helicopter Parenting and AI-Assisted Academic Misconduct Among Emerging Adults

Jacob Orozco, Guillermo Wated, and Sabrina Des Rosiers, (Department of Psychology, Barry University, Miami Shores, FL)

Empirical evidence consistently indicates that academic misconduct is far from rare in higher education. For instance, research from Newton and Essex (2024) found that 44.70% of 4,672 university students across 25 independent samples admitted to cheating on online exams. Academic dishonesty refers to deceptive behaviors that violate academic policies, such as fabricating data or misrepresenting one's work (Green, 2024; Lucas & Friedrich, 2005). As academic institutions continue to evolve, emerging technologies have blurred the boundaries of acceptable academic behavior. In particular, artificial intelligence (AI) has emerged as a prominent ethical concern (Vieriu & Petrea, 2025). Although AI learning systems can enhance students' understanding and academic performance, they are also increasingly being exploited for dishonest purposes (Imran, 2025). This practice, referred to as AI-giarism, involves students using AI to generate academic work and presenting it as their own without proper attribution (Chan, 2024). Despite growing concern, there is limited research examining AI-giarism within the broader framework of academic dishonesty. Furthermore, little is known about the factors that may predict AI-giarism among emerging adults. One factor that has been associated with unethical behavior in this population is helicopter parenting (Madison, 2025). Helicopter parenting is characterized by high levels of control, close monitoring, and intense parental involvement (Padilla-Walker & Nelson, 2012). This level of parental control can diminish a young person's sense of autonomy and hinder their ability to make independent choices. For instance, Evans and Karl (2022) reported that greater exposure to helicopter parenting was linked to higher levels of moral disengagement among Generation Z, suggesting that this parenting style may have unintended ethical consequences. Moral disengagement theory provides a useful explanation for this pattern, arguing that when parents tightly control a child's decisions and restrict opportunities for independent problem solving, the child has fewer opportunities to develop self-regulatory mechanisms (Bandura, 1999). As a result, these individuals

may become more susceptible to justifying or minimizing unethical behavior because they have not fully internalized the cognitive and moral processes needed to guide their own conduct. Therefore, the purpose of the present study is twofold. First, it seeks to expand an established measure of academic dishonesty to include behaviors related to AI-giarism. Second, it aims to explore whether helicopter parenting predicts AI-giarism among emerging adults. Understanding this association is key to shaping initiatives that promote academic integrity and curb AI-driven academic misconduct, while also shedding light on how helicopter parenting may increase university students' propensity to engage in AI-assisted academic misconduct.

42. It is about effort and perseverance: Association between grit and achievement in life domains among emerging adults

*Sofia Perez, Bathesheba Auguste, Sabrina Des Rosiers and Guillermo Wated
(Department of Psychology, Barry University, Miami Shores, FL)*

Emerging adulthood (EA) is a distinct developmental period spanning the late teenage years through the twenties, characterized by identity exploration, increasing autonomy, and transitions across multiple life domains (Arnett, 2007; Mitra et al., 2025). Psychological characteristics that support goal pursuit are particularly salient during this period. One such characteristic is grit, defined as perseverance of effort and consistency of interests toward long-term goals despite challenges (Duckworth, 2007). Prior research has documented associations between grit and favorable outcomes in academic, occupational, and performance contexts, largely within adolescent and adult samples (Duckworth, 2007; Sanguras, 2021). However, comparatively less is known about grit's association to achievement across diverse life domains including personal, social, academic, career, and overall well-being during emerging adulthood, (Shama et al., 2021). Grounded in Duckworth's (2007) theoretical conceptualization of grit, the present study examined associations between grit and life achievement factors among emerging adults. Participants were 259 emerging adults (M age = 21.21, SD = 1.47) who completed an anonymous survey assessing perseverance of effort and consistency of interests using the Short Grit Scale (Grit-S; Duckworth et al., 2007). Life achievement was assessed across academic, career, and health and well-being domains. Multiple regression analyses were conducted to examine the relative strength of associations between grit components and life achievement outcomes. Results indicated that perseverance of effort was related to the greatest amount of variance across all life achievement domains examined, including academic functioning ($\beta = .42, p < .001$), career functioning ($\beta = .33, p < .001$), and well-being ($\beta = .41, p < .001$). Consistency of interests demonstrated weaker associations across domains. These findings highlight the relevance of perseverance of effort during emerging adulthood and have practical

implications for university settings. Academic advising, coaching, and student support models that emphasize persistence and sustained effort may be more meaningful with developmental demands characteristic of this life stage.

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43. The Role of Dialectal Variation in Bilingual Listeners' Perception of Emotional Prosody

Carol Sacco and Justin Lauro (Department of Psychology, Barry University, Miami Shores, FL)

Bilingual speakers are frequently exposed to variation within languages, including regional dialects that differ in phonetic realization and prosodic patterns. However, it remains unclear whether exposure to multiple dialects influences bilingual listeners' sensitivity to emotional cues in speech. The present study examines whether familiarity with dialectal variation affects the perception of emotional valence in spoken language. Using a 2 × 3 within-subjects design, bilingual participants will complete an emotion identification task involving short, emotionally neutral phrases in Spanish, produced in two dialects, Cuban and Uruguayan, across three emotional prosody conditions (happy, neutral, and angry). Participants will then indicate the perceived emotion. Accuracy and reaction will serve as the dependent variables. We predict that bilingual listeners with greater exposure to multiple dialects will identify emotional prosody more accurately and efficiently, particularly when emotional cues vary across dialects. By examining both accuracy and response time, this study investigates how dialectal experience shapes the perception of affective meaning in speech. The findings will contribute to models of speech perception by highlighting the role of variability in emotional processing among bilingual listeners.

44. Episodic Specificity Induction as a Tool to Enhance Executive Function and Future-Oriented Thinking in Adolescents

Fiza Syed¹ and Justin Lauro² (¹American Heritage High School, Plantation, FL and ²Department of Psychology, Barry University, Miami Shores, FL)

Episodic Specificity Induction (ESI) is a cognitive training technique designed to enhance episodic retrieval processes, which may influence decision-making performance. The present study examined whether ESI improves behavioral

performance on the Iowa Gambling Task (IGT). Thirty high school students completed both an ESI condition and a control condition in a within-subjects design, with condition order counterbalanced across participants. The IGT was administered after each condition. Reaction time (RT) during decision-making trials served as the primary outcome measure. A linear mixed-effects regression model was conducted to examine the effects of Condition (ESI vs. Control), Session (Pre-test vs. Post-test), and their interaction on RT. The model included random intercepts and random slopes for Session for each participant. Results revealed a significant effect of Trial, $b = -3.92$, $SE = 0.20$, $t(5741) = -19.21$, $p < .001$, indicating that RTs decreased across trials, suggesting general task learning over time. The main effects of Condition and Session were not significant (both p 's $> .35$). The critical Condition \times Session interaction was also not significant, $b = -256.30$, $SE = 271.57$, $t(28) = -0.94$, $p = .353$. However, the direction of the interaction suggested a greater reduction in RT from pre- to post-test following the ESI condition relative to the control condition.

45. Psychological Well-Being as a Predictor of Intent to Quit School Among Undergraduate Veteran Students

Shane Salomon, Guillermo Wated, and Sabrina Des Rosiers, (Department of Psychology, Barry University, Miami Shores, FL)

Undergraduate student veterans are a high-risk subgroup of nontraditional students who must balance academic goals with significant external environmental pressures, such as full-time employment and family obligations (Alschuler & Yarab, 2018). According to Wagner and Long (2020), these students face a higher risk of attrition than traditional students due to service-related disabilities, which create substantial physical and psychological pressures. Even with access to financial benefits like the GI Bill, student veterans remain vulnerable to academic disruption and prolonged time-to-degree (Thomas et al., 2018). Notably, a recent report from the U.S. Department of Veterans Affairs (2024) indicates that more than 900,000 beneficiaries participated in VA education programs, underscoring the growing presence of veterans in higher education and the importance of understanding factors that influence their persistence. A model that is often used to better understand attrition in non-traditional students is Bean and Metzner's (1985) non-traditional undergraduate student model. According to this model, background factors (e.g., age), academic variables (e.g., study habits), external variables (e.g., finances), academic outcomes (e.g., GPA), and psychological outcomes (e.g., stress) predict the intent to leave school. Although several studies have successfully applied the model to predict students' persistence, most focus on structural barriers, such as transition challenges and service-related disabilities (e.g., Alschuler & Yarab, 2018; Chartrand, 1992; Morissette et al., 2021; Thomas et al., 2018; Wagner & Long, 2022), and place greater emphasis on psychological distress

(e.g., PTSD) than on positive psychological well-being. Therefore, examining broader dimensions of psychological well-being, such as Ryff's (1989) constructs of self-acceptance, positive relation with others, autonomy, environmental mastery, purpose in life, and personal growth, which have been widely linked to student behavioral outcomes (e.g., Lizarte Simón et al., 2024; Xiong & Zhai, 2025), may enhance existing attrition models. Grounded in Bean and Metzner's (1985) model of attrition and Ryff's (1989) model of psychological well-being, the purpose of the present study is to explore the predictive role of psychological well-being on the intention to quit school among undergraduate student veterans. It is anticipated that self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth will have an inverse relationship with intentions to quit school. The findings of this study may provide valuable insights for implementing support systems tailored to the unique experiences and challenges student veterans endure in higher education.

46. To what extent does emotion regulation predict the degree of acculturative stress among Hispanic Emerging adults?

Zakiyya Shaw, Sabrina Des Rosiers, Guillermo Wated (Department of Psychology, Barry University, Miami Shores, FL)

Acculturative stress refers to the psychological strain an individual can experience as a result of attempts to adapt to a new culture (Rodriguez et al., 2002). This factor poses significant challenges for first-generation emerging adults in the United States, who are disproportionately exposed to cultural changes such as differing social relationships, social identity, food and dress, and traditions (Archuleta, 2015). According to the U.S. Census (2020), first-generation Hispanics make up about 18.7% of the population. Given the size and growth of this demographic, further research is needed regarding acculturative stress and psychological processes. Research has shown that the types of emotion regulation (ER) strategies play a critical role in the management of emotional responses (Gross, 2001). In general, studies have found that the emotion regulatory strategy of cognitive reappraisal is associated with positive outcomes, whereas the ER expressive suppression approach is associated with difficulties in psychological functioning and increased likelihood for clinical outcomes such as depressive symptomatology (Chen et al., 2025). Current literature suggests a connection between emotion regulation strategies and acculturative stress such that emotion regulation differentially shapes the experience of acculturative stress (Mayorga et al., 2018). This study is based on Rodriguez et al. (2002) conceptualization of acculturative stress, which contends that acculturative stress is the direct result of cultural change including language differences, cultural differences, and cultural self-consciousness. The primary purpose of this study was to describe whether emotion

regulation skills of cognitive reappraisal and expressive suppression differentially predict acculturative stress in a sample of Hispanic emerging adults in the United States. This study included first-generation Hispanic individuals (N = 422), gender (men = 28%, women = 72%), mean age = 19.59 years (SD = 1.73). Most participants reported A/B grades (40.7%). To examine these predictive relationships, four hierarchical multiple regression analyses were conducted to describe whether emotion regulation strategies (cognitive reappraisal and expressive suppression) were predictors of acculturative stress outcomes, including native language competency pressures, English language competency pressures, pressure to acculturate, and pressure against acculturation. Each outcome was entered as a separate regression model. In each model, control variables (age, gender, and being born in the United States) were entered at Step 1, followed by cognitive reappraisal and expressive suppression at Step 2. In the first hierarchical regression model examining native language competency pressure, good model fit was observed, $F(5, 410) = 7.54, p < .001, R^2 = .084, \text{adjusted } R^2 = .073$. Cognitive reappraisal was inversely associated ($\beta = -.097, t = -2.02, p < .05$), whereas expressive suppression was positively associated ($\beta = .200, t = 4.09, p < .001$). For English language competency pressures, good model fit was observed, $F(5, 410) = 10.47, p < .001, R^2 = .113, \text{adjusted } R^2 = .102$. Cognitive reappraisal was inversely associated ($\beta = -.143, t = -3.03, p < .05$), and expressive suppression was positively associated ($\beta = .253, t = 5.26, p < .001$). For pressure to acculturate, good model fit was observed, $F(5, 411) = 4.13, p < .001, R^2 = .048, \text{adjusted } R^2 = .036$. Cognitive reappraisal was not significantly associated ($\beta = -.080, t = -1.64, p, \text{ns}$), whereas expressive suppression was positively associated ($\beta = .155, t = 3.11, p < .05$). For pressure against acculturation, good model fit was observed, $F(5, 410) = 7.31, p < .001, R^2 = .082, \text{adjusted } R^2 = .071$. Cognitive reappraisal was inversely associated ($\beta = -.141, t = -2.92, p < .05$), and expressive suppression was positively associated ($\beta = .255, t = 5.20, p < .001$). The findings of this study contribute to the literature by describing the pattern of associations between emotion regulation strategies and acculturative stress factors among Hispanic emerging adults. Consistent with theoretical expectations, expressive suppression emerged as a consistent risk factor across domains, whereas cognitive reappraisal functioned as a protective factor in most domains. These findings provide important implications for culturally responsive mental health interventions aimed at strengthening adaptive emotion regulation skills to mitigate acculturative stress in foreign-born Hispanic college students.

47. Association between cultural values and life satisfaction in Hispanic immigrant emerging adults

Elisa Valladares, Sabrina Des Rosiers, Guillermo Wated (Department of Psychology, Barry University, Miami Shores, FL)

Subjective well-being (SWB) is a multidimensional process that reflects individuals' affective experiences and cognitive evaluations of their lives (Pavot & Diener, 2008). Empirical studies that have used life satisfaction as a measure of subjective well-being found life satisfaction to be a consistent and strong predictor (Diener et al., 2013). In addition, studies have shown that because culture shapes both standards for life satisfaction and the pathways through which it is achieved, cultural value orientations and identity processes are central to how individuals evaluate their well-being. This is particularly noteworthy for Hispanic emerging adults, for whom culturally embedded values such as familism, interdependence, and collective identity coexist with developmental tasks of autonomy and personal identity formation salient to emerging adulthood. Triandis' (1998) cultural framework defines individualism as an emphasis on autonomy and personal goal attainment, whereas collectivism emphasizes social harmony and interdependence. A related cultural value construct is familism which refers to identification with, and obligation to family. Studies show familism is a core cultural value in Hispanic populations and has been found to be associated with adaptive functioning. Similarly associated with subjective well-being are individual-level characteristics like identity processes. Personal identity orientation refers to self-definition and coherence based on individual traits and internal attributes, whereas collective identity orientation reflects self-definition through group membership and relational roles. These predictors are conceptually important because they represent distinct but complementary pathways through which Hispanic emerging adults may achieve life satisfaction. The present study describes the relative contribution of cultural values (individualism, collectivism, familism) and identity orientations (personal and collective) in predicting life satisfaction among immigrant Hispanic emerging adults. Participants were 333 Hispanic emerging adults ages 18–29 ($M = 20.28$, $SD = 2.44$), with 78% identifying as female. The most frequently reported countries of Hispanic national origin were Cuba (13.2%), Mexico (11.4%), Colombia (9.0%), and Puerto Rico (6.0%). Most participants reported being from an intact family structure (67.9%). The analytic sample for multiple regression included 221 participants. Multiple regression analyses revealed that the overall model significantly predicted life satisfaction, $F(7, 213) = 10.45$, $p < .001$, accounting for 26% of the variance ($R^2 = .256$). Higher life satisfaction was significantly positively associated with personal identity orientation ($\beta = .346$, $p < .001$), familism ($\beta = .195$, $p < .05$), and collectivism ($\beta = .175$, $p < .05$), whereas interdependence was negatively associated ($\beta = -.354$, $p < .001$). Independence, individualism, and collective identity orientation were not observed to be statistically significant predictors in the final model. These findings suggest that SWB among Hispanic emerging adults represents a culturally integrated framework in which collectivism, personal identity and familism are associated with subjective well-being. This highlights that life satisfaction is not solely derived from autonomy, but from a dynamic balance between individual self-definition and culturally grounded relational values. These findings are meaningfully for culturally responsive preventative interventions approaches that seek to promote subjective well-being in Hispanic emerging adults.

DEPARTMENT OF HEALTH SCIENCES & CLINICAL PRACTICE

48. Fostering loyalty: Supervisor support versus instrumental support in prospective models of organizational commitment

Darius Estell¹, Andreas Stamatis², Kim McCoy Coleman³, Akanksha Anand⁴, and Zacharias Papadakis¹ (1Department of Health Sciences & Clinical Practice, Barry University, Miami Shores, FL, 2 Department Health and Sport Sciences, University of Louisville, Louisville, KY, 3 Department of Social Work, State University of New York, Plattsburgh, NY, 4 Department of Community Health and Policy, State Morgan University, Baltimore, MD, 1¹ Department of Health Sciences & Clinical Practice, Barry University, Miami Shores, FL)

BACKGROUND: While both supervisor and instrumental support are presumed to foster organizational commitment, their relative importance is unclear. We prospectively tested the unique effects of supervisor versus instrumental support on follow-up commitment and tested two mechanisms: substitution and thresholding. **METHODS:** County human services employees completed two surveys. We paired observations and modeled follow-up commitment from baseline commitment, supervisor support, and instrumental support, adjusting for work demands and trauma-informed climate. Primary analyses used ordinary least squares with HC3 robust standard errors. We tested substitution using Support x Instrumental and Support x Demands interactions and evaluated thresholding with restricted cubic splines. A change-on-change model examined whether within-person increases in supports tracked change in commitment. We reported collinearity indices and standardized betas. Alpha was .05 **RESULTS:** In an analytic of n=84, and similar to burnout, follow-up commitment was predominantly explained by baseline commitment ($b = 0.705$, $p < .001$, $\beta = 0.68$). After full adjustment, the unique linear prospective effects of supervisor support ($p=.109$) and instrumental support ($p=.302$) were not significant, and there was no evidence of resource substitution. However, a non-linear thresholding effect for supervisor support was detected, indicating a significant U-shaped relationship with commitment ($p=.009$). **CONCLUSIONS:** Organizational commitment, like burnout, exhibits high inertia. Our prospective analysis reveals that while supportive environments correlate with commitment, they do not uniquely drive it over time. This finding challenges the assumption that more support always bolsters loyalty. Instead, the relationship appears more complex; commitment may falter at moderate levels of supervisor support, suggesting that both low and very high levels of engagement from a supervisor could be more beneficial than intermediate levels. This indicates that while commitment is a stable attitude, its maintenance is not immune to the specific nature of supervisor interactions.

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49. Prioritizing burnout prevention in human services: quantifying the unique contributions of work demands, organizational support, mental toughness, and trauma-informed climate

*Isabella Goitiz*¹, *Andreas Stamatis*², *Kim McCoy Coleman*³, *Akanksha Anand*⁴, and *Zacharias Papadakis*¹ (¹Department of Health Sciences & Clinical Practice, Barry University, Miami Shores, FL, ² Department Health and Sport Sciences, University of Louisville, Louisville, KY, ³ Department of Social Work, State University of New York, Plattsburgh, NY, ⁴ Department of Community Health and Policy, State Morgan University, Baltimore, MD, ¹Department of Health Sciences & Clinical Practice, Barry University, Miami Shores, FL)

BACKGROUND: Burnout is prevalent in human services. Although organizational climate, tangible support, and individual mental toughness (MT) are often cited, their unique contributions are seldom compared head-to-head. This study asked a resource-allocation question: given overlap among predictors, which factors show the strongest unique associations with burnout, and what proportion of explained variance do they account for? **METHODS:** County human services employees provided survey data at two administrations, yielding 192 observations from 97 employees. In a pooled ordinary least squares model, burnout was regressed on composite scores for perceived work demands, instrumental organizational support, MT and trauma-informed climate. We reported standardized coefficients, variance inflation factors, relative importance shares using LMG, and both HC3 and cluster-robust (by person) standard errors. **RESULTS:** The model was significant, $F(4,187) = 55.77$, $p < .001$, explaining 54.4% of burnout variance. Work demands showed the largest unique association with higher burnout ($\beta = 0.38$, $p < .001$). Instrumental support ($\beta = -0.26$, $p = .003$) and MT ($\beta = -0.14$, $p = .008$) were significant protective correlates. The unique association for trauma-informed climate (TIC) was not significant after adjustment ($\beta = -0.17$, $p = .054$). Collinearity was acceptable (VIF range $\approx 1.2-3.3$). Relative importance shares were: Demands 34.7%, TIC 28.6%, Instrumental Support 28.2%, MT 8.5%. Separate wave-specific models at each administration yielded the same ordering of predictors. **CONCLUSIONS:** In this cohort, workload is the dominant correlate of burnout, and two levers show independent protective links: instrumental support and MT. Trauma-informed climate aligns with lower burnout in simple correlations, but its unique contribution is attenuated when related supports are considered. Findings support a dual-track prevention strategy that reduces demand load while strengthening concrete supports and skills. Future work should test within-person change and compare unique contributions using relative-importance metrics in longitudinal models.

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50. Event-specific body composition and metabolic profiles in NCAA division 2 track athletes

Vitoria Paes do Nascimento, Isabel Vera Martinez, Mikayla Davis, and Antonella V. Schwarz (Department of Health Sciences, Barry University, Miami Shores, FL)

BACKGROUND: Body composition and resting metabolic rate (RMR) are important determinants of training and performance in track and field, influencing both energy requirements and event specialization. While such data are well-documented in elite and Division I athletes, limited normative information exists for NCAA Division II (DII) populations, despite their unique competitive demands. METHODS: Thirty-two DII track and field athletes (sprinters: $n = 21$; distance runners: $n = 11$; age: 19.2 ± 1.0 yr) underwent bioelectrical impedance analysis (BIA) to assess body composition and RMR. Variables included body mass, fat mass (FM), fat-free mass (FFM), height, and RMR. Independent samples t-tests were conducted in Jamovi (version 2.6.26) to compare sprinters and distance runners. RESULTS: Sprinters were significantly heavier than distance runners (66.0 ± 7.6 vs. 56.6 ± 6.7 kg; $p = 0.002$, $d = -1.29$). They also demonstrated greater absolute FFM (55.4 ± 9.5 vs. 44.3 ± 7.1 kg; $p = 0.002$, $d = -1.27$) and higher RMR (1745 ± 268 vs. 1428 ± 196 kcal/day; $p = 0.002$, $d = -1.29$). In contrast, distance runners exhibited a higher percentage of body fat compared to sprinters ($17.7 \pm 7.6\%$ vs. $12.2 \pm 6.3\%$; $p = 0.038$, $d = 0.81$), whereas sprinters displayed a greater percentage of FFM ($87.8 \pm 6.3\%$ vs. $82.3 \pm 7.6\%$; $p = 0.038$, $d = -0.81$). CONCLUSION: DII sprinters and distance runners display distinct anthropometric and metabolic profiles consistent with the demands of their respective events. Sprinters carried greater lean mass and had higher resting metabolic rates, while distance runners exhibited higher relative body fat. These findings provide normative data for DII athletes and underscore the importance of tailoring nutrition and training strategies to event specialization. Establishing these benchmarks may also help practitioners identify deviations from expected profiles, guide performance optimization, and inform athlete monitoring over time.

51. Do organizational vs. personal resources buffer work demands in relation to job satisfaction among county human services employees?

Alaisha Rodriguez¹, Andrea Stamatis², Kim McCoy Coleman³, Akanksha Anand⁴, and Zacharias Papadakis¹ (1Department of Health Sciences & Clinical Practice, Barry University, Miami Shores, FL, 2 Department Health and Sport Sciences, University of Louisville, Louisville, KY, 3 Department of Social Work, State University of New York, Plattsburgh, NY, 4 Department of Community Health and Policy, State Morgan University, Baltimore, MD, 1' Department of Health Sciences & Clinical Practice, Barry University, Miami Shores, FL)

BACKGROUND: Human services work involves sustained emotional and time pressures, but organizational resources like trauma-informed climate (TIC) and instrumental support may protect job satisfaction. Personal resources such as mental toughness (MT) may also relate to satisfaction. We tested whether TIC and instrumental support attenuate the association between work demands and satisfaction, beyond mental toughness. **METHODS:** We used averaged survey data from county human services employees ($N \approx 130$) to model job satisfaction. A hierarchical linear model first assessed the impact of work demands and MT; then, added TIC and instrumental support to test for unique and buffering effects. **RESULTS:** While higher demands predicted lower satisfaction initially, this effect disappeared after accounting for organizational resources. Both TIC ($b = 0.156, p < .001$) and MT ($b = 1.098, p = .001$) were strong positive predictors of satisfaction. Critically, both climate ($p = .023$) and instrumental support ($p = .029$) significantly buffered the negative association between demands and satisfaction. **CONCLUSIONS:** Mental toughness was positively related to satisfaction, but it was the organizational resources that uniquely protected employees from the strain of high demands. Strengthening TIC and practical support are therefore critical and actionable targets for enhancing workforce well-being.

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52. More Than a Good Boss: Instrumental Support Versus Supervisor Support in Prospective Models of Burnout

Brehanna Cornwall¹, Andreas Stamatis², Akanksha Anand³, Kim McCoy Coleman⁴, and Zacharias Papadakis¹ (¹ Department of Health Sciences & Clinical Practice, Barry University, Miami Shores, FL, ²Health and Sport Sciences, University of Louisville, Louisville, KY, ³ Department of Community Health and Policy, Morgan State University, Baltimore, MD, ⁴Social Work, State University of New York, Plattsburgh, NY)

BACKGROUND: Efforts to reduce employee burnout often target supervisor behavior; yet, operational resources like adequate tools and conditions may be more critical. We prospectively compared the unique effects of instrumental support and supervisor support on burnout and tested two mechanisms: substitution and thresholding. **METHODS:** County human services employees completed two survey waves. We paired observations and modeled follow-up burnout from baseline burnout, instrumental support, and supervisor support, adjusting for demands and trauma-informed climate. Primary analyses used ordinary least squares with HC3 robust standard errors. Substitution was tested with Instrumental \times Supervisor and Instrumental \times Demands interactions. Thresholding was evaluated with restricted cubic splines for instrumental support. A change-on-change model examined whether within-person

increases in supports tracked change in burnout. We reported collinearity indices and standardized betas. Alpha was .05 RESULTS: In analytic of $n = 70$, follow-up burnout was overwhelmingly predicted by baseline burnout ($b = 0.730$, $p < .001$). After adjusting for baseline levels and other covariates, the unique effects of both instrumental support ($p = .679$) and supervisor support ($p = .076$) were not statistically significant. Further analyses found no evidence for resource substitution or non-linear thresholding effects. CONCLUSIONS: In this cohort, burnout demonstrated remarkable temporal stability, largely resisting change from either instrumental or supervisor support. This suggests that once burnout becomes established, it may act as a chronic condition. Therefore, organizational efforts must shift from intervention to primary prevention, focusing on identifying at-risk staff and mitigating demands before burnout solidifies.

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53. Change in trauma-informed climate predicts lower burnout but not higher job satisfaction

Kostadinov Floros - Angelinas¹, Andreas Stamatis², Akanksha Anand³, Kim McCoy Coleman⁴, and Zacharias Papadakis¹ (¹ Department of Health Sciences & Clinical Practice, Barry University, Miami Shores, FL, ²Health and Sport Sciences, University of Louisville, Louisville, KY, ³ Department of Community Health and Policy, Morgan State University, Baltimore, MD, ⁴Social Work, State University of New York, Plattsburgh, NY)

BACKGROUND: Agencies are increasingly adopting trauma-informed practices to support workforce well-being. However, it remains unclear whether strengthening trauma-informed climate (TIC) primarily reduces strain or also boosts positive outcomes. We tested whether within-person change in TIC relates differently to changes in burnout and job satisfaction. METHODS: County human services employees completed two survey waves. For each participant, Time-2 minus Time-1 change scores were computed for TIC, burnout, and job satisfaction. Primary linear models predicted the follow-up outcome from change in TIC while controlling the baseline level of that outcome. Analyses used outcome-specific paired samples. Alpha was .05; HC3 robust standard errors were examined. RESULTS: Paired observations were $n = 70$ for the burnout analysis and $n = 84$ for the satisfaction analysis. Improved TIC was significantly associated with reduced burnout ($r = -0.27$, $p = .023$), and this effect held in the adjusted model (robust $p = .024$, standardized $\beta = -0.13$, $R^2 = .72$). In contrast, change in TIC was unrelated to change in job satisfaction ($r = 0.04$, $p = .709$). CONCLUSIONS: In this workforce, improvement in TIC tracked with reduced burnout over time, whereas job satisfaction did not change in tandem. Therefore, improving organizational TIC appears

to be a practical lever for mitigating burnout; additional strategies may be required to enhance job satisfaction in public service settings.

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54. Does mental toughness buffer work demands for burnout and work-interference with family?

Michael Fox¹, Andreas Stamatis², Akanksha Ananda³, Kim McCoy Coleman⁴, and Zacharias Papadakis¹ (¹ Department of Health Sciences & Clinical Practice, Barry University, Miami Shores, FL, ²Health and Sport Sciences, University of Louisville, Louisville, KY, ³Department of Community Health and Policy, Morgan State University, Baltimore, MD, ⁴Social Work, State University of New York, Plattsburgh, NY)

BACKGROUND: While employees are often encouraged to build personal mental toughness (MT), it remains unclear if MT can truly protect them from high work demands. We tested whether MT attenuates the negative association of work demands with two outcomes: burnout and work-family interference (WIF). METHODS: Using data from two survey waves (n = 69), we modeled follow-up burnout and WIF. The models predicted each outcome from its baseline level, work demands, MT, and their interaction (Demands x MT), while adjusting for organizational supports. Predictors were mean-centered to prevent multicollinearity. RESULTS: For both burnout and WIF, the strongest predictor of the follow-up outcome was its baseline level (p < .001). The critical Demands x MT interaction was not significant for either burnout (p = .622) or WIF (p = .242), indicating that MT did not buffer the impact of work demands. CONCLUSIONS: Contrary to the buffering hypothesis, MT did not protect employees from the negative effects of work demands on burnout or WIF in this cohort. Our findings suggest that organizational strategies should focus on managing work demands directly rather than relying solely on the MT of employees.

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55. Exploring players' perspectives on the use and effectiveness of in-game performance adjustments using film review

Elias Kenedy, Naomi Bonet, BreAuna Bailey, Trinity Hambrick, Ma Shengyan, Mistake Mistake, Itay Basevitch, and Nataniel Boiangin (Department of Sport & Exercise Sciences, Barry University, Miami Shores, FL)

Previous research has highlighted the value of film review technology in sport (Pearson et al., 2025). Film review has been shown to enhance athletes' decision-making, align players with coaches' tactical intentions, increase confidence and motivation, support reflective practice, provide performance focused feedback, and facilitate opponent preparation, among other benefits (Groom et al., 2011; O'Donoghue, 2006; Wright et al., 2016). In recent years, similar to the increased use of real-time physiological and performance analytics, film review has begun to appear during competition across several major sports, particularly within collegiate and professional contexts. The adoption of in game film review varies widely by sport, competitive level, and governing regulations, and its practical application continues to evolve. Despite this growth, empirical literature examining the use, effectiveness, and applied value of in game film review remains limited. Thus, the purpose of the study was to determine the effectiveness of in-game performance adjustments using film review from the players' perspective. Current and retired team sport players were asked to fill out a survey that included Likert type questions (i.e., scale from 1-5) and open-ended questions about their use and effectiveness of in game film review. Eight male participants (Mage = 26.25, SDage = 4.06) filled out the survey. Participants were from a variety of sports such as basketball, football and soccer, played different positions and had playing experience at the college or professional levels. Participants reported that they were familiar with in game film review (M = 4.25, SD = 1.49), thought that it was very effective (M = 4.75, SD = 0.46) and important (M = 4.75, SD = 0.46). Furthermore, players noted that they used in game film review at half-time, during breaks, when on the bench and after making mistakes. Some issues reported by players about the use and effectiveness of in game film review include communication with the coaches, limited video angles and not enough time to review the film. The findings of the study provide support that in game film review is perceived by players as effective, helpful and useful. Additionally, results indicate that more research is needed to optimize the use of in game film review and increase the effectiveness and benefits of the technology.

56. Criterion validity of the Fibion SENS® in classifying physical activity under laboratory conditions

Lia Larramendi Mirabal, Roy Shohat, Hinata Sakamoto, and Zacharias Papadakis (Department of Health Sciences & Clinical Practice, Barry University, Miami Shores, FL)

BACKGROUND: The Fibion SENS® is a wearable motion sensor designed to classify physical activity (PA) type and intensity. The aim of this study was to evaluate its criterion validity by comparing its PA classifications to directly observed activity in a controlled laboratory setting. **METHODS:** Nineteen healthy adults (7 females, 12 males) completed a structured protocol comprising sedentary behavior (i.e., lying, sitting, standing) and ambulatory activities (i.e., slow walk, brisk walk, jog, run) across two trials. The Fibion SENS® was worn on the anterior thigh. Activity bouts were time-synchronized and aligned with human-recorded observations (True PA). Categorical agreement between Fibion and True PA was assessed using quadratically weighted Cohen's Kappa (κ), with percentage agreement (Po) computed from a 266-item matrix. To ensure a valid comparison across devices, all activity classifications were recoded into a uniform 3-level scale (Sedentary, Light, Moderate/Vigorous) prior to analysis to avoid sparse categories and enhance interpretability. **RESULTS:** The Fibion SENS® demonstrated almost perfect agreement with observed PA classifications ($\kappa = 0.99$, SE = 0.00463, 95% CI = 0.98–1.00), and 98.9% observed agreement. Agreement was highest for sedentary and light activity categories, with minor misclassifications noted in moderate bouts. **CONCLUSIONS:** The Fibion SENS® shows excellent criterion validity in classifying PA type and intensity under controlled conditions. Its classification performance supports its use for objective movement monitoring in research settings.

Funding from Fibion SENS® was received for this study.

57. Concurrent Validity of the Fibion Sens® Compared to Cosmed CPET® and Equival Lifemonitor® Systems

*Hinata Sakamoto, Roy Shohat, Lia Larramendi Mirabal, and Zacharias Papadakis
(Department of Health Sciences & Clinical Practice, Barry University, Miami Shores, FL)*

BACKGROUND: Wearable devices require validation against gold-standard tools to confirm their utility in research and clinical applications. This study evaluated the concurrent validity of the Fibion SENS® by comparing its PA classifications with those from the Equival LifeMonitor® and COSMED CPET® metabolic system and the Fibion SENS®. **METHODS:** Nineteen healthy adults completed seven physical activity tasks of varying intensity in a laboratory setting. Activity classification outputs from Fibion SENS® were matched against Equival LifeMonitor® and COSMED CPET®. Agreement was quantified using quadratic weighted Cohen's Kappa and percentage agreement using 266 subjects/items and 4 raters/measurements. To ensure a valid comparison across devices, all activity classifications were recoded into a uniform 3-level scale (Sedentary, Light, Moderate/Vigorous) prior to analysis to avoid sparse categories and

enhance interpretability. RESULTS: The Fibion SENS® demonstrated a high observed agreement of 84.2% with the Equivital LifeMonitor® and a more moderate agreement of 59.8% with the COSMED CPET® system. Inter-rater reliability was almost perfect with the Equivital LifeMonitor® ($\kappa = 0.87$, SE = 0.02, 95% CI = 0.83–0.91) and substantial with the COSMED CPET® ($\kappa = 0.75$, SE = 0.02, 95% CI = 0.71–0.79). These robust kappa values confirm that the concordance between devices was significantly greater than what would be expected by chance. CONCLUSIONS: The Fibion SENS® demonstrated excellent agreement with the Equivital system and substantial agreement with the COSMED system. The substantial kappa values, coupled with the high degree of observed agreement, support the utility of the Fibion SENS® as a valid tool for classifying physical activity in research settings.

Funding from Fibion SENS® was received for this study.

58. Beyond the fastball: Tracking shoulder adaptations with the ash test in collegiate pitchers

Linus Wirth, Katherine Kenny, Hinata Sakamoto, Lia Larramendi Mirabal, and Antonella Schwarz (Department of Sport & Exercise Sciences, Barry University, Miami Shores, FL)

BACKGROUND: The Athletic Shoulder (ASH) test, performed in the I, Y, and T positions, has been proposed as a reliable assessment of shoulder function, but data in collegiate pitchers remain limited. This study evaluated pre- to post-season changes in Division II pitchers using force platform measures. METHODS: Six Division II starting pitchers (age: 21.83 ± 1.72 yr; height: 186.17 ± 8.04 cm; mass: 91.43 ± 13.82 kg) completed the ASH test pre- and post-season. Peak vertical force (PVF), rate of force development (RFD), and impulse (200 ms) were measured bilaterally in all three positions using VALD force decks. Linear mixed models (time, arm; random factor: subject) tested main effects, and Cohen's d quantified pre-post changes. Statistical analyses were performed using Jamovi (version 2.6.26). RESULTS: No significant main effects were detected for PVF ($p = 0.69$), RFD ($p = 0.96$), or impulse ($p = 0.25$). Descriptively, PVF was stable across positions, with a moderate increase in the non-dominant T position ($d = +0.54$). RFD showed negligible changes (all $|d| < 0.5$). Impulse demonstrated the most notable adaptations, with moderate-to-large increases in the dominant arm (I: $d = +0.59$; Y: $d = +0.81$; T: $d = +0.72$) and smaller increases in the non-dominant arm ($d = 0.30$ – 0.41). CONCLUSION: Although statistical significance was not reached, effect sizes indicated consistent improvements in impulse, particularly in the dominant arm. Practically, these findings suggest that over the course of a collegiate season, pitchers may maintain or slightly enhance their ability to generate rapid isometric force despite high throwing volumes. Increases in impulse may reflect neuromuscular adaptations to repeated

loading, even without large strength gains. From a monitoring perspective, the ASH test offers a low-fatigue, position-specific tool for tracking shoulder health and readiness, with impulse emerging as the most sensitive indicator of within-season adaptation.

Research took place at Barry university campus in the research lab of the sport Exercise Science department.

Submissions of images by:

Patrae Cartwright

Ernest Charles

Dicarlo Davis

Precious Ezeamama

Hannah Fox

Trevea Hanna

Neissa Rousseau

Thierry Taylor

Jessie Wiles

Tremaine Woods

Barry University



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