Celebration of SCHOLARSHIP

THURSDAY, APRIL 13, 2023

Oral Presentation Program

IWU'S ANNUAL UNDERGRADUATE RESEARCH CONFERENCE

SPONSORED BY THE JOHN WESLEY HONORS COLLEGE

ORAL PRESENTATION SCHEDULE

Leedy Banquet Hall		
8:20am		
8:40am	Natalie Lakanen *Natural Sciences*	Polariton Modification of Chemical Kinetics
9:00am	Mary Bonanno *Natural Sciences*	Investigating the synergistic effects of HKLm, IFNy, and CCL3 on macrophage activation using RAW 264.7 cell line
9:20am	Alex Cartwright *Natural Sciences*	Endocytosis Inhibition as a Rescue Strategy for Zoledronate-Induced Cell Death
9:40am	Madeline Burghaze *Natural Sciences*	Identifying Intermediate Sterols in Azole-Induced Set4 Expression in Candida glabrata
10:00am	Rachel Leninger *Natural Sciences*	Monocarboxylate Transport Mediates ATP-Induced Extracellular Acidification of Glia
10:20am	Simon Falconer *Natural Sciences*	Producing a Cre-loxP Inducible Knockout Construct for use in Tetrahymena thermophila
10:40am	Leah Stallkamp *Natural Sciences*	The Effect of Hydrogen Bond Exchange on Polaritonic Spectra
11:00am	Lauren Lively *Behavioral Sciences*	The Effect of Religious Trauma on Identity
11:20am	Sharikah Woeste and Aeden Ligon *Health and Human Performance*	The significance of Synthetic vs. Natural Grass playing surfaces on ACL epidemiology in American Football: A Literature Review
LUNCH		
2:00pm	Hannah Hartmann and Christina Schulenburg *Nursing*	Hometown Advantage: The Influence of The Birthplace Effect and Hometown Demographics in College Soccer Players
2:20pm	Lindsey Cox *Nursing*	Nurse-Midwives and Their Influence on Maternal and Neonatal Outcomes
2:40pm	Jonathan Rybka *Nursing*	Abortion, Disability, and the Christian Response
3:00pm	Madelen Tevalan Cruz *Nursing*	Why Latinos in Healthcare Matter
3:20pm	Miriam Hagg *Nursing*	The Effects of High Ability Labels on Psychological Health in Undergraduate Students
3:40pm		
4:00pm		
4:20pm		
4:40pm		

ORAL PRESENTATION SCHEDULE

Bedford Banquet Hall		
8:20am	Daniella Morales *Behavioral Sciences*	Between Two Worlds: A Quantitative Study on the Beliefs of Immigrant and Non-Immigrant IWU Students Towards Immigration
8:40am	Anna Shigley, Breann Barger, Drake Morton, Makayla Mcdole, Sydney Yoder *Behavioral Sciences*	Do They Accept Me?: A Quantitative Study on Socioeconomic Status and Belonging
9:00am	Kristy Bowden, Aleyah Cline, Raffi Fry, Abbe Hershberger, Skylar Thompson *Behavioral Sciences*	Running from Stress: A Quantitative Study on Anxiety in Athletes and Non-Athletes
9:20am	Katherine Ziegler, Taylor Cason, Hannah Hummel, Lauren Beemer *Behavioral Sciences*	Is There a Missing Piece at Indiana Wesleyan University: A Study on Belonging and Ethnicity
9:40am	Jordan Luedtke, Storm Braaten, Katie Ireland, Destiny Olson, and Annabele Spiker *Behavioral Sciences*	Degree for the Disadvantaged: A Quantitative Study on Academic Performance and Parental Substance Abuse
10:00am	Lauren Mikec, Courtney Verhoek, Abby Montgomery, Seth Strand, Hailey Evans *Behavioral Sciences*	Spiritual Growth During Undergraduate Years at Indiana Wesleyan University
10:20am	Mia Alanis, Grace Degenhart, Jaileen Diaz, Parker Lee, and Mackenzie Reasoner *Behavioral Sciences*	Craving Something More: A quantitative study on the relationship between spirituality and length of sobriety
10:40am	Mikayla Kovac *Behavioral Sciences*	Kiss Lori for Me
11:00am	Colten Mowat *Natural Sciences*	Visualization and Quantitation of TRITC-Dextran Uptake in Human Gingival Fibroblasts
11:20am	Theodore Houseman; Conner Murphy *Natural Sciences*	Optimization of a CellProfiler™ Software Pipeline to Quantitate Fluorescently-Labeled Zoledronate Distribution in Human Gingival Fibroblasts
LUNCH		
2:00pm	Melody Branan, Faith Jackson, Ryan Whiteman *Health and Human Performance*	The Validity of Bioelectrical Impedance for Testing Resting Metabolic Rate, Compared to Indirect Calorimetry using a Metabolic Cart
2:20pm	Abbey Burton, Andy Cleverly, and Riley Spoltman *Health and Human Performance*	Kinesiology Tape's Perceived Effects on Muscular Strength within Individuals
2:40pm	Jaclyn Grubbs, Kendra Coryell, Hannah Whitehouse *Health and Human Performance*	Effects of Celsius© on Anaerobic Performance
3:00pm	Jacob Keith, Dalton Kinney, and Madeline Lawrence *Health and Human Performance*	Effect of Different Durations of Whole-Body Vibration on Dynamic Postural Stability
3:20pm	Spencer Hathaway; Jesse Clement; Cameron Lain *Health and Human Performance*	Dynamic Postural Stability in College Football Players with Chronic Ankle Instability
3:40pm	Taylor Waterway, Lucy Martin, Ella Klhar *Health and Human Performance*	Physiological Differences on a Standard Treadmill versus a Lower Body Positive Pressure Treadmill
4:00pm		
4:20pm		
4:40pm		

ORAL PRESENTATION SCHEDULE

Jones Banquet Hall		
8:20am		
8:40am	Mara Smith *Mathmatics*	Nonlinear Lotka-Volterra Competition Models
9:00am	Andrea Munroe *Physics*	CERN Data Validation: Enabling Future Physicists to Discover New Particles
9:20am	Caleb Muthiah *Marketing*	Marketing Consultant Report for Custom Concrete and CTA
9:40am	Jacob Dingus *Social Sciences*	GeoLearn
10:00am	Danielle Nowe *Education*	The Educational Disadvantages Facing Native Spanish-Speaking Students in US High Schools
10:20am	Hallie Hunt *Music*	Why Music Impacts Social Bonding: An Examination of Cultural, Biological, and Emotional Factors
10:40am	Madeline MacKinnon *Theology and Miniistry*	The Feel of the Dance: Form, Racial Redemption, and Lessons from Jazz
11:00am	Kyra Thompson *Theology and Ministry*	Outreach Services and Community Receptiveness: An Analysis Produced by Non-Profits vs. Local Churches
11:20am	Livie Taggart *Theology and Ministry*	The Women behind the Wealth: Female Philanthropy and the American Experience
LUNCH		
2:00pm	Hannah Hubley *Modern Language & Literature*	A Wind in the Forest
2:20pm	Emily A. Bays *Modern Language & Literature*	Legends: The Writing of a Greek Myth Retelling
2:40pm	Zoe Yoquelet *Modern Language & Literature*	The Role of the Public Library in Supporting Local Literacy
3:00pm	Emily Dexter *Modern Language & Literature*	Fluorescent: A Short Story Collection
3:20pm	Grace Payne *Modern Language & Literature*	Students Have Trauma, too: Why and How Teachers Can Use Young Adult Literature to Address Sexual Assault and Rape Culture
3:40pm-5:00pm	Lauren Richards, Isabel David, Emily Dexter, Wes Denney, Jerah Winn, Morgan Parrish, Shea Brown, Quinn Miersma, Thomas Kraus, Betsy Marshall, and Anna Wright *Modern Language & Literature*	Poetry Reading by the Students of WRI 358 Poetry Writing Seminar

2023 SENIOR DESIGN PRESENTATIONS

Visual Communication and Graphic Design & Design for Social Impact

April 13, 2023 | 2:00 – 5:40 | Beard Arts Center: Lecture Hall 150

1:30 - 1:45 **KRISTA RAYMOND**
Mental Health Access: The First Step Made Simple

1:45 – 2:00 **GRANT WAYNER**
Celebrating Women in the NFL

2:00 - 2:15 **ALEXIS KIRCHNER**
Employer Awareness of Mental Health in the Workplace

2:15 – 2:30 **MAKAYLA BECHTOLD**
Constraints of Historic Preservation and Restoration: Designing a Seamless Process

2:30 – 2:45 **KATIE SMARRELLA**
Building Bridges

2:45 - 3:00 **DAVID LOPEZ**
Title Forthcoming

3:00 – 3:15 **GRACE HATHAWAY**
Ending Modern Day Slavery

3:15 – 3:30 **MATTEA FRY**
Designing Connection Between Future Teachers and Impoverished Students

8:20am Bedford

Between Two Worlds: A Quantitative Study on the Beliefs of Immigrant and Non-Immigrant IWU Students Towards Immigration

Daniella Morales, *Behavioral Sciences*

This study aims to understand the beliefs of Indiana Wesleyan University undergraduate students towards immigration and immigrants. The study will be conducted with two groups, separated by those who are adult children of immigrant parents and those who are not. The study will shed light on the beliefs and attitudes of the undergraduate students towards immigration and immigrants.

8:40am Leedy

Polariton Modification of Chemical Kinetics

Natalie Lakanen, *Natural Sciences*

Polariton chemistry is a relatively new field that studies the effects of polaritons produced by coupling optical states to vibrational modes. Our research explored how polaritons modify chemical kinetics. We used a simple isomerization system of cis and trans-stilbene and aimed to compare the chemical kinetics inside and outside a Fabry-Pérot cavity.

8:40am Jones

Nonlinear Lotka-Volterra Competition Models

Mara Smith, *Mathmatics*

The classical Lotka-Volterra equations that model the interactions between two species competing for a limited resource have many potential modifications to improve biological accuracy; this paper explores modifications to the exponent of the competition term. After an introduction to the behavior of the classical Lotka-Volterra model is given, a nonlinear modification to this model by Taylor and Crizer is discussed. In section 2, an extension of this modification is proposed, in which the population variable of the competition term is raised first to the power of positive real numbers and, next, small integers. A proof is offered that at most 3 coexistent equilibrium points exist for any positive exponent values, and additional proofs further limit the number of equilibria for certain exponent and parameter values. In section 3, we prove that, in such models, the stability of the equilibria alternates between stable and unstable when considered in a northwest to southeast configuration. Combining these results allows us to describe the equilibrium behavior of a broad class of competition models.

8:40am Bedford

Do They Accept Me? : A Quantitative Study on Socioeconomic Status and Belonging

Anna Shigley, Breann Barger, Drake Morton, Makayla Mcdole, and Sydney Yoder, *Behavioral Sciences*

The purpose of this research study is to investigate the relationship between student sense of belonging and their socioeconomic status at Indiana Wesleyan University using a quantitative study. College students completed a revised version of the Sense of Belonging Scale, which measures the sense of belonging based on perceived peer support, perceived classroom comfort, perceived isolation, and perceived faculty support. The results of this study reflect students' perceived sense of belonging and provide a better understanding of the effects of a student's socioeconomic status. This information will allow Indiana Wesleyan University to have a better understanding of its students and facilitate inclusivity.

9:00am Leedy

Investigating the synergistic effects of HKLm, IFNy, and CCL3 on macrophage activation using RAW 264.7 cell line

Mary Bonanno, *Natural Sciences*

As a part of the Summer Undergraduate Research Program at Albert Einstein College of Medicine, Mary researched the activation of macrophages in Dr. Gregoire Lauvau's lab. Upon recognition of a cognate antigen, CD8+ T cells release cytokines for the activation of the innate immune system before clonal expansion occurs providing a rapid immune response. Immunosuppressed individuals often lack the immune response needed to stimulate macrophages in this way. A potential therapeutic option is to create a bispecific fusion antibody that mimics the cytokine release from T cells to activate monocytes. It has been seen in vivo that memory T cells activate monocytes to initiate protection against tumors by the release of cytokines IFNy and CCL3. Our goal is to create an in vitro assay to assess the functionality of a newly developed bispecific IFNy and CCL3 fusion antibody that will be used to stimulate macrophages in vivo. The in vitro assay has 3 signals, a bacterial antigen (HKLm), CCL3, and IFNy that stimulate production of transcription factors and activation markers which can be analyzed by flow cytometry. The minimum microbial signal for activation of macrophages in vitro has been determined and the monomeric INFy fusion antibody improves the release of activation markers from monocytes. The development of this antibody in vitro will contribute to the development of a macrophage activating immunomodular antibody therapy.

9:00am Jones

CERN Data Validation: Enabling Future Physicists to Discover New Particles

Andrea Munroe, *Physics*

On June 5th, 2022, the European Council for Nuclear Research (CERN) began taking Run III data at a record 13.6 TeV to search for new particles. This new run of proton-proton collision data concludes a four-year period of equipment and software upgrades. In this project, one particular

aspect of the data- Level 1 Jet Trigger Efficiencies in the ATLAS experiment- is analyzed to validate the effectiveness of these upgrades. Efficiency measurements suggest that the upgrades are effective, so any future changes in trigger performance indicate new physics rather than artifacts of this new data-recording methodology.

9:00am Bedford

Running from Stress: A Quantitative Study on Anxiety in Athletes and Non-Athletes

Kristy Bowden, Aleyah Cline, Raffi Fry, Abbe Hershberger, and Skylar Thompson, *Behavioral Science*

The purpose of this study is to reveal if there is a significant difference in anxiety levels between Indiana Wesleyan University athletes and non-athletes, aged 18-25. Participants completed a survey utilizing the GAD-7, a reliable and valid anxiety measurement tool. The GAD-7 measures the level and severity of anxiety based on responses to seven questions. As the topic of mental health is becoming more prevalent in conversations, this study helps reflect the growing issue of mental health illness among college students. Additionally, this study shows how common anxiety is among undergraduate students at Indiana Wesleyan University.

9:20am Leedy

Endocytosis Inhibition as a Rescue Strategy for Zoledronate-Induced Cell Death

Alex Cartwright, *Natural Sciences*

Medication-related osteonecrosis of the jaw (MRONJ) arises most often in cancer or osteoporosis patients. The disease causes the jawbone and surrounding tissue to necrose, leaving painful intraoral fistulae and complications. Nitrogen-containing bisphosphonates (NBP's) are the most prominent risk factor for MRONJ. Zoledronate (ZOL) is one of the most potent NBP's available and was therefore chosen for this study. Blocking ZOL's entry specifically into cells of the oral cavity would make treatment easier for these same patients by removing the possibility of developing MRONJ from systemic NBP administration. This study investigates endocytosis as a possible cell uptake mechanism for ZOL by inhibiting different types of endocytosis and further determining if any of the inhibition rescues from ZOL-induced viability loss. This study used an endocytosis inhibitor panel that included Chlorpromazine, Methyl β-Cyclodextrin, Wortmannin, and Dynasore each of which inhibits a different subcategory of endocytosis. Normal human oral keratinocyte (NHOK), confluent human gingival fibroblast (HGF), and Michigan Cancer Foundation 7 (MCF-7 human breast cancer) cell lines were tested for responses. The cells were treated with both ZOL and an endocytosis inhibitor to discover the endocytosis mechanism in use. Subsequent experiments with sub-confluent HGF's did reveal prevention of ZOL-induced viability loss in the presence of Dynasore (data in a separate presentation). The collective results indicate that inhibition of endocytosis (likely macropinocytosis) by Wortmannin or Dynasore in NHOK's and by Dynasore in HGF's is an effective way to lower ZOL-induced viability loss.

9:20am Jones

Marketing Consultant Report for Custom Concrete and CTA

Caleb Muthiah, *Behavioral Sciences*

Custom Concrete is a concrete company based out of Indianapolis that owns a number of subsidiaries, including Custom Truck & Auto. It has established itself as a reliable, high-quality service organization. It is essential, moving forward, to differentiate themselves from competitors and grab a firmer hold on the market. In looking at Custom Truck & Auto, or CTA, a situational analysis reveals a lacking online presence, limiting their ability to reach a wider customer base. Through the implementation of new marketing campaigns, CTA can address this and focus on growing customer loyalty and brand awareness. Increased value for the company will point to the superior service offerings and firm values that form the foundation of CTA. A stronger brand identity, coupled with an increased brand awareness, can act as a jumping point for the organization in the future. Both Custom Concrete and CTA have the opportunity to maintain their current market shares and seek out ways to grow moving forward.

9:20am Bedford

Is There a Missing Piece at Indiana Wesleyan University: A Study on Belonging and Ethnicity

Katherine Ziegler, Taylor Cason, Hannah Hummel, Lauren Beemer, *Behavioral Sciences*

This study looked at the diversity of ethnicity that is present at Indiana Wesleyan University and the level of belonging that is experienced by ethnic minorities and the ethnic majority. The researchers sought to understand whether or not there was a significant difference between the level of belonging experienced among ethnic minorities versus the ethnic majority. The study sampled students aged 18-25 living on the campus of Indiana Wesleyan University, it explored the participants' overall sense of belonging and connectedness in relation to their ethnicity through a self reported survey. The instrument that was used to conduct this study was the Belonging Scale survey that will be administered via email to students as well as through snowball sampling.

9:40am Leedy

Identifying Intermediate Sterols in Azole-Induced Set4 Expression in Candida glabrata

Madeline Burghaze, *Natural Sciences*

Candida glabrata infections are a growing concern in clinical settings due to the pathogen’s intrinsic resistance to azole drugs and ability to rapidly develop clinical drug resistance. Azole drugs target lanosterol 14-alpha demethylase (Erg11), a key enzyme in the ergosterol biosynthesis pathway. Inhibiting Erg11 leads to depletion of ergosterol and a buildup of intermediate toxic sterols. In Saccharomyces cerevisiae, expression of the protein Set4 is induced under azole treatment, but its overexpression leads to azole hypersusceptibility. In both S. cerevisiae and C. glabrata, Erg3 is an enzyme in the ergosterol biosynthesis pathway that corresponds with upregulation of Set4. In the presence of azoles or when Erg3 is absent, ergosterol is depleted and the cell resorts to side pathways to produce intermediate sterols.

Because the expression of Set4 is increased when Erg3 is absent, we hypothesize that these intermediate sterols accumulate under ergosterol depletion, then act as signaling molecules to induce the expression of Set4. To determine if intermediate sterols induce SET4 expression, we probed the ergosterol biosynthesis pathway by generating a series of CRISPR-mediated single and double deletions of involved genes. Using these deletion strains, we determined the downstream impact on Set4 expression at the transcript level, as well as phenotypic characterization of each strain.

9:40am Jones

GeoLearn

Jacob Dingus, *Social Sciences*

This geography education website was designed to use elements of gamification and color theory to engage users better while learning about the world around them. With an interactive map, appealing quizzes, and other engaging elements, this platform offers a fun way to learn geography. In this presentation, you will hear about the development process behind the final product, including the motivations, design choices, and underlying complexities of the website.

9:40am Bedford

Degree for the Disadvantaged: A Quantitative Study on Academic Performance and Parental Substance Abuse

Jordan Luedtke, Storm Braaten, Katie Ireland, Destiny Olson, and Annabele Spiker, *Behavioral Sciences*

This study aims to provide a quantitative analysis of the grade point average variances between Indiana Wesleyan University-Marion campus students who grew up with parents or guardians who struggle with substance abuse and those who do not have parents or guardians with that addiction. College students will complete a survey that will provide the researchers with insight into the students' experiences on IWU's campus.

Keywords: Addiction, chemical dependence, college student, drug abuse, grade point average, guardian, illicit, overdose, quantitative study, socioeconomic, substance use disorder, vulnerable.

10:00am Leedy

Monocarboxylate Transport Mediates ATP-Induced Extracellular Acidification of Glia

Rachel Leininger, *Natural Sciences*

Recent studies in neurophysiology have led to an increased interest in the effect of glial cells on neuronal signaling. Previous research regarding retinal Tiger Salamander Müller cells, a type of glia, revealed how ATP-dependent extracellular acidification can inhibit synaptic transmission through a cellular pathway involving intracellular calcium, purinergic receptors, and altered regulation of sodium-hydrogen exchange (NHE). This study demonstrates the common function

that the NHE shares with ATP-mediated extracellular acidification in cultured rat astrocytes or axolotl Müller cells. Isolated cells were examined through self-referencing, a method of measuring extracellular pH using an electrode containing a proton-permeable ionophore. The study also reveals the role of a monocarboxylate transporter (MCT) in glial cell signaling pathways, suggesting that lactate transport contributes to the ATP-induced extracellular acidification. These findings display the importance of MCT along with NHE in mediating astrocyte and Müller cell signaling. The cross-species conservation of this mechanism observed in both rats and axolotls suggests that this form of regulation using pH is fundamental to brain function. These methods of measuring extracellular pH through self-referencing can be used in determining the remaining portions of the cell signaling pathway, and this research can contribute to future studies of nervous or retinal tissue function *in situ.*

10:00am Jones

The Educational Disadvantages Facing Native Spanish-Speaking Students in U.S. High Schools

Danielle Nowe, *Education*

Spanish-speaking students are often one of the most overlooked groups of students when it comes to receiving support in American high schools. They are expected to succeed without being given the proper tools that would allow them to do so. Their English-speaking peers have an unfair advantage, strictly due to the lack of a language barrier. In this presentation, I will present a few of the most prominent resources that Spanish-speaking students lack and their effects on the students, both short-term and long-term. I will also present a few solutions that can be used to remedy these gaps in support and resources.

10:00am Bedford

Spiritual Growth During Undergraduate Years at Indiana Wesleyan University

Lauren Mikec, Courtney Verhoek, Abby Montgomery, Seth Strand, and Hailey Evans, *Behavioral Sciences*

The purpose of this quantitative study is to understand how the spirituality of students at Indiana Wesleyan University is affected based on their year in college and to discover whether there is a growth, decline, or stagnation in the spirituality of college students. While other studies show the benefits of students prioritizing spirituality during their college years, the effects of spirituality on students' mental and physical health, and the factors that affect a student's spirituality, there is a lack of information surrounding how spirituality shifts throughout one's college career. This study aims to fill that gap in the literature through the students of all grade levels here at Indiana Wesleyan University and their responses to the Spiritual Involvement and Beliefs Scale (SIBS). Campus ministries can then benefit from the results of this study so as to tailor their teachings to better fulfill the spiritual needs to students attending IWU and involving themselves in their ministries. While there are many ministries around campus to choose from, it is essential to continue the growth and development of these ministries in the same way that it is important to further the growth and development of the spirituality of college students. This study hopes to do just that.

10:20am Leedy

Producing a Cre-loxP Inducible Knockout Construct for use in Tetrahymena thermophila

Simon Falconer, *Natural Sciences*

Gene knockout is a popular strategy for elucidating the function of an unknown gene. This strategy involves rendering a gene of interest and/or its products dysfunctional and observing the resulting phenotype. The Linger Lab at Indiana Wesleyan University has designed and assembled a DNA construct that could be used to facilitate the complete, inducible knockout of target genes in the macronucleus of the model organism Tetrahymena thermophila. The design of the construct builds upon prior research with the intention of overcoming certain limitations inherent to previous Tetrahymena knockout strategies. The construct functions by utilizing the high recombination frequency of Tetrahymena, phenotypic assortment, the MTT1 promoter, and the bacterial Cre-loxP system, and it will be tested through its application to the study of telomere-associated proteins Pot1 and Pat1.

10:20am Jones

Why Music Impacts Social Bonding: An Examination of Cultural, Biological, and Emotional Factors

Hallie Hunt, *Music*

Music is often considered to be a “universal language,” meaning that it may cross language and cultural barriers to connect people despite their differences. It is also a human invariant, meaning that all people of all cultures engage with music in various ways. There are countless examples throughout human existence of music building connections between people. This research seeks to understand why this phenomena occurs. Through exploring cultural, biological, and emotional factors involved, this research details some of the various factors that gives music this kind of power, and what the implications may be for the field of music therapy.

10:20am Bedford

Craving Something More: A quantitative study on the relationship between spirituality and length of sobriety

Mia Alanis, Grace Degenhart, Jaileen Diaz, Parker Lee, and Mackenzie Reasoner, *Behavioral Sciences*

The purpose of this research study is to explore the relationship between spirituality and the length of sobriety from alcohol and drug use through a quantitative analysis, specifically in Grant County, Indiana. The method of this study is a quantitative approach utilizing a cross-sectional survey design. Participants will be recruited through two separate Christ-centered sober living homes in the area. The demographics and the Spirituality Involvement and Belief Scale (SIBS) survey questions will be considered to reach a conclusion. The results of this study will demonstrate a statistically significant correlation between the length of sobriety and spirituality. This study will

inform professionals in social work, psychology, addiction counseling, and other social services on the issue of substance addiction and the role of spirituality in addiction recovery.

10:40am Leedy

The Effect of Hydrogen Bond Exchange on Polaritonic Spectra

Leah Stallkamp, Natural Sciences

The field of polariton chemistry studies the coupling of photons and molecules to produce hybrid light-matter states. Polaritonic-vibrational coupling research has primarily focused on using polaritons to modify chemical reactions. However, the effect of chemistry on polariton spectrum formation has largely been ignored. Here, we examine how the breaking and forming of hydrogen bonds within a solution affects the nature of the hybrid light-matter states. Using solutions of methyl acetate in methanol and D2O, we couple the carbonyl stretch to a Fabry-Pérot cavity. By changing the path length, of the cavity, we can experimentally control the lifetime of the optical states. We observe three distinct polariton states when the cavity lifetime is 600 fs. But when the cavity lifetime is increased 1200 fs, only two polariton states are observed in the data. The data indicate that chemical interactions can drastically modify hybrid light-matter states.

10:40am Jones

The Feel of the Dance: Form, Racial Redemption, and Lessons from Jazz

Madeline MacKinnon, *Theology and Ministry*

What does it mean for four black men in the '60s to perform such a prestigious piece as Naima? What counts more: Improv or Order? Why does an attentive audience matter? John Coltrane's Naima revolutionized the world of Jazz and the world at large, unleashing people's imaginations for music, racial redemption, and life at large. Come join in the interactive learning session, where you'll get a chance to partake in activities and dialogue around significant, groundbreaking themes found in one single song: Naima.

10:40am Bedford

A Kiss Lori For Me

Mikayla Kovac, *Behavioral Sciences*

How to market a book after publishing to draw in more of an audience and how having a mentor can help you further develop your marketing and research skills.

11:00am Leedy

The Effect of Religious Trauma on Identity

Lauren Lively, *Behavioral Sciences*

The aim of this study was to assess the relationship between religious trauma and identity. Using Patricia Linville's theory or "spill-over" in identity concepts, we analyzed how religious trauma may affect more than just one aspect of the self. A survey of one hundred and thirty participants showed that though identity is not detrimental to a person's sense of self, it does have significant effects on their identity as a whole. The results revealed that religious trauma was negatively correlated with religious identity, $R(130) = -.58$, $p = .001$, and faith identity, $R(130) = -.48$, $p = .001$, but religious trauma was not correlated with the importance placed on other identities, $R(130) = -.06$, ns. Statistical analysis also showed that those who reported trauma felt a lower sense of belonging in the groups they participate in ($M = 5.24$, $SD = 1.32$), but recognized the influence of the group more than those who did not report trauma ($M = 4.57$, $SD = 1.32$), ($M = 3.82$, $SD = 1.83$), $t(129) = 2.26$, $p = .03$. Although the results did not prove the original hypothesis, this study showed that religious trauma does impact portions of identity, both personally and socially. These results provide the groundwork on which further research concerning the relationship between identity and religious trauma can be built.

11:00am Jones

Outreach Services and Community Receptiveness: An Analysis Produced by Non-Profits vs. Local Churches

Kyra Thompson, *Theology and Ministry*

This survey, supported by research, is a case study on non-religious and religious-based organizations and the participation of the people amongst whom are the recipients in the community from the worker's/member's perspective. I wish to define the ""effectiveness"" of outreach depending on the participation of people served by these organizations and discern any causes for lack of participation with an emphasis on the effect of being a religiously-oriented organization or non-religious. I expect to find that people are more positive about letting non-profits promote change in one's life rather than churches, or faith-based organizations, due to the Church's exclusivity and requirements that don't match the immediate needs of families in Marion.

I hypothesize people gain more long-term transformation and direct change from Non-Profit organizations rather than churches due to underlying statements during my time working in outreach and supporting research, which describes the Church's search for goods in return from those who receive their services and hinder transformation in people.

11:00am Bedford

Visualization and Quantitation of TRITC-Dextran Uptake in Human Gingival Fibroblasts

Colten Mowat, *Natural Sciences*

Zoledronate (ZOL) is a nitrogen-containing bisphosphonate (NBP), anti-bone resorptive agent used to treat patients with multiple myeloma, metastatic cancer to bone, osteoporosis, and Paget's disease of bone. ZOL is often prescribed to patients having bone lesions associated with hematological malignancies to prevent skeletal-related events (SREs). High doses of this medication delay onset of SREs and reduce pain in patients with cancers that have metastasized to bone. However, developing medication-related osteonecrosis of the jaw (MRONJ) is a serious side effect of taking NBPs. More than 90% of MRONJ cases occur in patients with cancer and bone metastases who receive high doses of NBPs or denosumab. Individuals affected with MRONJ are unable to heal from dental procedures, leading to painful oral lesions that involve exposed bone and unhealed soft tissue. Previous findings from our lab indicate that ZOL does not enter human gingival fibroblasts (HGFs) via soluble carrier sodium-dependent transporters as earlier predicted by some groups. However, 10 mM Dynasore, a dynamin inhibitor thought to reduce membrane ruffling required for fluid-phase endocytosis, was able to prevent viability loss in HGFs subsequently treated with 50 mM ZOL, suggesting that ZOL may enter HGFs via this mechanism. To investigate that question, a positive control was needed. It is known that tetramethylrhodamine isothiocyanate fluorescently-labeled dextran (TRITC-dextran) is taken into HGFs via fluid-phase endocytosis as measured by flow cytometry. The purpose of the study reported here was to visualize and quantitate TRITC-dextran uptake in HGFs via confocal fluorescent microscopy with the eventual goal of extending that visualization and quantitation to fluorescently-labeled ZOL uptake. Confocal fluorescence visualization and quantitation was best facilitated by analyzing sub-confluent and not confluent cultures at a concentration of 0.3 mg/ml TRITC-dextran. A method for quantitating fluorescent TRITC-dextran signal from individual cells was employed with the use of ImageJ software. The same protocol was used to calculate the corrected total cell fluorescence for TRITC-dextran in the absence and presence of prior 10 mM Dynasore treatment. Preliminary results indicated a modest decrease in TRITC-dextran uptake after Dynasore treatment. Additional captures and quantitations from a larger number of cells as well as independent quantitation verification through flow cytometry is warranted.

11:20am Leedy

The significance of Synthetic vs. Natural Grass playing surfaces on ACL epidemiology in American Football: A Literature Review

Sharikah Woeste and Aeden Ligon, *Health and Human Performance*

Lower extremity injury rates within American football are numerous and the high-risk nature of the sport contributes to annual injury surveillance outcomes. One consideration of high injury rates is the playing surface. Technology has afforded many playing surfaces to become synthetic alternatives to natural grass. Research has argued whether lower extremity injury rates were comparable across multiple playing surfaces (Hershman, 2012 & Mack, 2019). Specific research has shown that the synthetic turf fields do not release cleats as rapidly and readily as the natural

field does which could be a factor in lower extremity injuries rates. By utilizing research conducted to evaluate claims towards synthetic and non-synthetic playing surfaces linked to lower extremity injury rates, a literature review was conducted to compare to outcomes and formulate a summary. Our proposed hypothesis was whether lower extremity injury rates (ACL injuries), are increased on artificial turf playing surfaces as opposed to natural grass playing surfaces among American Football athletes. In higher-quality studies, support has grown in favor of increased rates of ACL injury on synthetic playing surfaces in football (Balazs, 2015).

11:20am Jones

The Women behind the Wealth: Female Philanthropy and the American Experience

Livie Taggart, *Behavioral Sciences*

Dolly Parton is more than a millionaire country singer-songwriter. Mary Ellen Pleasant's story goes much further than the "Voodoo Queen" of San Francisco in the 1800's. In researching these prominent women in American history, their philanthropic efforts are recognized and revealed. In 1800's San Francisco, Mary Ellen Pleasant disguises herself as a housekeeper and gave thousands to abolition efforts. Dolly Parton, in Modern America, went back to her Tennessee roots to make sure books were available to children in the community, raising literacy rates across her state, the U.S.A., and even into other countries. This project will investigate the legacies of these women, then look toward options for future philanthropic ventures on both a small and large scale.

11:20am Bedford

Optimization of a CellProfiler™ Software Pipeline to Quantitate Fluorescently-Labeled Zoledronate Distribution in Human Gingival Fibroblasts

Theodore Houseman and Conner Murphy, *Natural Sciences*

Medication-related osteonecrosis of the jaw (MRONJ) is a serious intraoral side effect of bisphosphonate, antiangiogenic, and denosumab treatments. Individuals affected with MRONJ are unable to heal from dental procedures, leading to painful oral lesions that involve exposed bone and unhealed soft tissue. Consequently, the development of a topical to prevent bisphosphonate-induced oral cell viability loss is a long-term goal. Previous findings from our lab demonstrated the ability of 10 microM Dynasore (Dyn), a dynamin inhibitor, to completely prevent viability loss in human gingival fibroblasts (HGFs) induced by 50 microM zoledronate (ZOL, a potent bisphosphonate). In addition, Dyn inhibited HGF endosomal acidification thought to be necessary for the maturation of ZOL-containing endosomes. Maturation of the endosomes involves their movement to the perinuclear region prior to fusion with the lysosome and delivery of the contents to the cytosol. We hypothesized that this pathway is needed to deliver ZOL to the cytosol where it can inhibit its target enzyme and cause viability loss. In order to understand whether Dyn's ability to prevent ZOL-induced viability loss involves interference with the endosomal maturation pathway, the current study quantitated TRITC Dextran (an endosomal pathway marker control) as well as AF647-ZOL intracellular fluorescence distribution from confocal fluorescent images utilizing an optimized CellProfilerTM software pipeline. Prior to fixation and microscopic capture, HGFs were pre-treated with 30 microM Dyn or with vehicle for 15 minutes, followed by addition of 50 microM AF647-ZOL or 0.3 mg/mL TRITC Dextran for each

of 1- and 72-hour incubations. Dyn pre-incubation significantly decreased perinuclear localization of TRITC Dextran 5.9-fold ($p<0.0001$) in cells captured after 1 hour of incubation, consistent with inhibition of the endosomal maturation pathway. By 72 hours of incubation, perinuclear localization of TRITC Dextran was decreased by a modest but significant 1.3-fold ($p<0.0001$). Pre-incubation with Dyn minimally decreased perinuclear localization of AF647-ZOL after 1 hour of incubation and no significant change in perinuclear localization was observed after 72 hours of incubation. Our collective results show that Dyn inhibits endosomal acidification, a necessary step in the endosome maturation pathway; however, Dyn does not prevent ZOL-containing endosomes from completely trafficking to the perinuclear region. Therefore, an additional mechanism must contribute to Dynasore's ability to prevent ZOL-induced viability loss in HGFs.
This work was funded through Indiana Wesleyan University's Hodson Research Institute.

2:00pm Leedy

Evaluation of Polypharmacy in the Geriatric Population: A Comparative Study Between the Dominican Republic and the United States Hannah Hartmann and Christina Schulenburg, N*ursing*

The geriatric population (ages 65+) suffers from polypharmacy, or the taking of multiple medications, unnecessarily. Polypharmacy increases the risk for drug-drug reactions and unwanted side effects, which gives the geriatric population a poorer quality of life. Drug-drug interactions occur when two drugs cause unwanted side effects because one drug affects the other in a negative way and vice versa. This article will look at the differences of polypharmacy between the Santo Domingo, Dominican Republic and Indiana, United States.

2:00pm Jones

A Wind in the Forest
Hannah Hubley, *Modern Language and Literature*

What would you do if you found yourself in a forbidden relationship that has no good reason for being forbidden? In this fantasy chapter book, narrated in the first person, a young lady named Larina must deal with that dilemma. In her world, a tradition exists that keeps people with different magical powers from associating with each other. This is based on a variety of negative assumptions that the groups hold against each other, along with a civil war that occurred many years before. Larina can control nature, especially the plants and animals of the forest, and her friend-turned-love interest controls the wind. They start hanging out together after Aurel, Larina's new friend, rescues her from a race of destructive giants. At the same time, Larina is supposed to marry a person of her kind named Florian, but they cannot love each other in that way. Larina and Aurel know that their world is in great danger. The giants are raiding villages and causing widespread destruction. When Larina's village is raided, she must speak with the Lord of her people and the King to see if the different groups can unite together against the giants. After so much division, can these groups come together? Can what has been destroyed be restored? Can Larina and Aurel be together? The main characters must test their courage and their love for each other as they seek for a better way of life in which people can freely travel and associate with each other. The main theme of this book is that we are stronger together than we are divided, in spite of our differences. The story also has a strong female main character, which is not too common in fantasy writing.

2:00pm Bedford

The Validity of Bioelectrical Impedance for Testing Resting Metabolic Rate, Compared to Indirect Calorimetry using a Metabolic Cart
Melody Branan, Faith Jackson, and Ryan Whiteman, *Health and Human Performance*

This research was collected with the intent of finding a faster and less expensive method for measuring clients resting metabolic rates (RMR) for applications in clinical settings. The purpose of this study is to discover if bioelectrical impedance analysis (BIA) can produce valid results in

testing an individual's RMR compared to indirect calorimetry using a metabolic cart (MC). Thirty-one participants (n=31) above the age of 18 were recruited to complete both a 3-5 minute BIA scan and a 30-minute RMR test on the MC. Predicted RMR values were recorded first through a BIA. Measured RMR values were recorded using a ventilated canopy hood connected to a metabolic cart (MC). The two values were correlated using an SPSS Pearson's r correlation. Researchers found that there was a strong positive correlation between the two variables, r(30)=[0.868], p=[<0.001]. Both the MC and the BIA scan appear to result in statistically significantly similar metabolic requirement values. The conclusion is that the BIA is a suitable and valid replacement for the MC when it comes to measurement or RMR values. Further research may need to be done to expand upon the substitutionary use of BIA. Clinicians of many kinds should consider incorporating the BIA for metabolic testing to increase knowledge of patients' nutritional demands, patient education in regard to their metabolic rate, tracking progress throughout programs, along with bridging the difficult conversation about prescriptive weight loss and gain.

2:20pm Leedy

Nurse-Midwives and Their Influence on Maternal and Neonatal Outcomes

Lindsey Cox, *Nursing*

The role of the midwife has been essential throughout history, but the midwife's role has become threatened by the emergence and complications of modern medicine. Midwives have faced obstacles and fought to maintain their title of essential while also advocating for increased education and the well-being of their patients. Nurse-midwives' practice was once essential, but now it is sought out as an alternative to physician-model-led care. However, as the U.S. faces rising maternal and neonatal outcomes, the critical role of nurse-midwives is being recognized. To prove the influence of nurse-midwives on birth outcomes, an investigation into the history of maternal care, the importance of nurse-midwifery-led prenatal care, and the differences in practice philosophy between nurse-midwives and physicians, the current mortality trends, and the initiatives to improve birth outcomes are essential.

2:20pm Jones

Legends: The Writing of a Greek Myth Retelling

Emily A. Bays, *Modern Language and Literature*

This project will be an exploration of my writing process while writing my Senior Capstone Novel: The Legend of Andromeda.

The plot of the novel is as follows: Princess Andromeda lives in the kingdom of Aethiopia with her sister Nympha and her best friend Pamphilos, a stableboy. When she is very young, Casseopia rashly promises to only let her marry a hero. As a result of this promise, Andromeda is cast into a series of events that will ultimately lead her to sacrifice herself to save her kingdom from a terrible serpent.

This project is told from Andromeda's point of view, and includes a retelling of the story of Perseus from her perspective. This retelling also tells the stories of the people around Andromeda, such

as her parents, Perseus, and her sister Nympha, and it gives more significance to Andromeda's sacrifice to explore what it means to truly be a hero.

The project will explore the historical and cultural research I did surrounding the time period I set the novel in, as well as the various novels I drew inspiration from when crafting my own. In addition, the project will give insight into some of the more general techniques I use for novel writing and how I utilized them in this specific piece.

2:20pm Bedford

Kinesiology Tape's Perceived Effects on Muscular Strength within Individuals

Abbey Burton, Andy Cleverly, and Riley Spoltman, *Health and Human Performance*

Purpose: There are about 150 thousand medical professionals who utilize Kinesiology Tape in their practice to assist in pain modulation, proprioception, and post-injury treatment. Due to a lack of knowledge, clients seeking treatment for musculoskeletal issues may be subject to a placebo effect causing them to believe that the tape may increase their muscular strength.

PURPOSE: To determine whether kinesiology tape influences an individual's perceived strength.

METHODS: A group of 23 healthy individuals (18-24 years old) volunteered for this study. Perceived strength was measured using a VAS (Visual Analog Scale). Six trials of maximal grip strength were performed, three without kinesiology tape and three after kinesiology tape application. Grip strength was tested using a hand grip dynamometer.

RESULTS: It was found that an individuals' perceived grip strength increased after kinesiology tape was applied, despite being applied in a manner which inhibits grip strength. This result is due to the placebo effect associated with the kinesiology tape and how individuals anticipate it will affect muscular strength.

CONCLUSION: It can be concluded that kinesiology tape may cause a placebo effect to occur when used on individuals who lack knowledge regarding use and function of the tape. While it is important for clients to be aware of the purpose of treatment modalities being applied, the placebo effect could also be used to their advantage by creating an enhanced sense of performance possibly leading to faster recovery, increase in performance, or increase in strength.

2:40pm Leedy

Abortion, Disability, and the Christian Response

Jonathan Rybka, *Nursing*

The disproportionately high abortion rate of babies prenatally diagnosed with an intellectual or developmental disability (IDD) today can be traced back to the influence of the eugenics movement in the early days of pro-abortion advocacy. This has created many false beliefs and harmful attitudes surrounding individuals with IDD, reflected in the arguments in favor of allowing abortion for cases of disability. The church should be prepared to respond to these arguments and take action to support mothers and families who face the uncertainty of raising a child with an IDD and love them as Christ would.

11:20am Jones

The Role of the Public Library in Supporting Local Literacy

Zoe Yoquelet, *Modern Language & Literature*

In August 2022, Governor Holcomb announced a $111 million investment into public school systems to improve state test scores in English and writing. I spoke with librarians from four different public libraries across Indiana and asked if they believe they should play a role in Holcomb's attempts to improve literacy.

In my project, "The Role of Public Libraries in Supporting Local Literacy," I asked Indiana librarians what role they see themselves playing in supporting literacy rates in light of Governor Holcomb's literacy investment. Indiana public librarians saw the public library as a necessary resource that answers community needs, including supporting literacy. Indiana librarians spoke on the various programs offered for children and adults that promote literacy skills. While Indiana public libraries do not track and measure the specific impact on literacy rates, research shows a link between public library programs and improved literacy skills, specifically with children. Children's programming was the main avenue public libraries used to promote literacy, with summer reading programs being the most common and successful. Studies show that children who participate in public library summer reading programs score higher on reading achievement tests, achieving Holcomb's goal for the literacy investment—but public libraries will never see any of the investment money.

Public libraries do not receive adequate funding that reflects the value and impact public libraries have on communities. Along with addressing where public librarians see themselves in improving state literacy rates, my project also aims to educate others on the importance of public libraries. My project aims to advocate that the public library should be included in the conversation about literacy and should be viewed as an essential resource in supporting literacy.

2:40pm Bedford

Effects of Celsius© on Anaerobic Performance

Jaclyn Grubbs, Kendra Coryell, Hannah Whitehouse, *Health and Human Performance*

The purpose of this study was to evaluate the effects of the Celsius© energy drink on short-term energy (anaerobic) performance using a 30 second bike sprint test known as Wingate. Each participant came in two times, drank either the placebo or Celsius©, and performed an "all out" bike sprint on the Wingate bike. After all the tests were completed, average and peak performance were compared. Paired t-tests were conducted to compare the average and peak power of both the Celsius© and placebo showing no significant difference between the two. Heart rate and temperature pre and post consumption were compared using a Wilcoxon test also showing no significant increase. By doing this research, there was determined to be no effect of Celsius© on anaerobic performance compared to past research that showed a positive effect from Celsius© on aerobic performance.

3:00pm Leedy

Why Latinos in Healthcare Matter

Madelen Tevalan Cruz, N*ursing*

The Latino/Hispanic population in the US is increasing rapidly. With this population increasing, we see that there are disparities that are becoming more prominent. One issue is the lack of equal health care due to language barriers and a lack of understanding Latino/Hispanic culture. The need for Hispanic/Latino Healthcare workers is increasing, yet some barriers arise when pursuing a career in the medical field. This study focused on the barriers many Hispanic students face when pursuing a career in the medical field and how the IWU School of Nursing has responded to these barriers.

3:00pm Jones

Fluorescent: A Short Story Collection

Emily Dexter, *Modern Language & Literature*

As an English and writing major, I have spent countless hours over the course of my college career honing my craft and striving to become a better writer. For my Writing Capstone project, I chose to continue this journey by creating a collection of magical realist short stories. In this presentation, I will discuss my inspiration and writing process, as well as read one of the collection's stories.

3:00pm Bedford

Effect of Different Durations of Whole-Body Vibration on Dynamic Postural Stability

Jacob Keith, Dalton Kinney, and Madeline Lawrence, *Health and Human Performance*

Increased postural stability in athletics has been linked to a decrease in injury risk as well as an increased ability to complete desired movement patterns required by the sport. Whole-body vibration is a technique that has been tested throughout the world of sports and rehabilitation to try to increase postural stability as well as muscular strength, muscular power, vertical jump height, flexibility, and balance. However, it is not yet known what duration of whole-body vibration, if any at all, is most effective at increasing dynamic postural stability.

PURPOSE: To determine if 3 minutes or 5 minutes of whole-body vibration is more effective than no vibration at all in increasing dynamic postural stability in collegiate athletes.

METHODS: This study had one outlier, so 15 healthy collegiate athletes (21.07 ± 1.06 yrs; 78.43 ± 10.82 kg; 178.97 ± 5.51 cm) were used for analysis. Baseline postural stability tests were measured before whole-body vibration through the bilateral and unilateral drop jump tests. 3 minutes of whole-body vibration was completed and then the drop jump tests were repeated. At least 48 hours later, participants returned for 5 minutes of vibration followed by the drop jump tests.

RESULTS: The vibration intervention did not elicit statistically significant changes in vertical ground reaction force (GRF) of double leg post vibration, $F(2, 28) = .344$, $p < .712$, with GRF

39.01 ± 16.07 N at 0 minutes of vibration, 36.69±17.79 N post 3 minutes of vibration, and 37.84±16.83 N at post 5 minutes of vibration. The intervention also did not yield any statistical significant changes for the stance leg (p = .925) or the dominant leg (p = .786) when comparing 0, 3, and 5 minutes of post vibration.

CONCLUSION: There were slight decreases in GRF on double leg and when comparing dominant and stance leg, but this decrease was found statistically insignificant. However, dominant leg GRF was consistently decreased between 0, 3, and 5 minutes. Further research should be done to determine if vibration therapy has a positive impact on one's postural stability. In further research, more participants could help lead to a significant finding.

3:20pm Leedy

The Effects of High Ability Labels on Psychological Health in Undergraduate Students

Miriam Hagg, *Nursing*

For years, healthcare professionals and educators have recognized that additional resources can aid children who are falling behind academically with their future mental health, academic achievement, and overall success. However, most high-ability students do not receive specialized interventions as long as their academic performance stays consistent. As a result, modern academic literature has suggested that interventions may support high-ability students as they work to achieve overall success, but little to no research has been done to explore the impact of interventions on high-ability students' mental health outcomes. This presentation will explore potential correlations between a high-ability label in childhood and the development of mental health disorders, as mediated by parental support in childhood and social support in college and will include research implications for institutions like Indiana Wesleyan University.

3:20pm Jones

Students Experience Trauma, Too: How and Why Teachers Can Use Young Adult Literature to Address Sexual Assault and Rape Culture

Grace Payne, *Modern Language & Literature*

Sexual assault and rape, topics that are highly prevalent and impactful to our world, are grossly underdiscussed with students in secondary education. According to the NSVRC, studies show that 25% of women in the U.S. experience completed or attempted rape and almost 25% of men in the U.S. experience some kind of sexual violence; with 1 in 3 of those women and about 1 in 4 men experiencing it for the first time between the ages of 11 and 17. The great influence teachers have in their jurisdiction of education means they should have the opportunity to address these topics with their students. In the last few decades, several young adult novels have been published that directly deal with the topic of sexual assault and rape. These can be a perfect way to introduce these ideas and discuss rape culture with students in a safe environment.

This project will explore how young adult literature can be used for classroom discussions pertaining to sexual assault and why it is important for these discussions to happen. This project uses several sources of peer-reviewed journals that give professional experience and advice in handling these topics. Interviews with real student survivors of sexual assault and teachers of

secondary education will be used to add relevant and real-world experiences to my research. My study aims to show that young adult literature can and should be used by secondary educators and brings evidence to support this claim.

Key words: disclosure, education, pedagogy, rape myths, victim-blaming

3:20pm Bedford

Dynamic Postural Stability in College Football Players with Chronic Ankle Instability

Spencer Hathaway, Cameron Lain, Jesse Clement, and Kyoungyoun Park-Braswellpencer
Health and Human Performance

Chronic ankle instability (CAI) is a result of recurrent ankle sprains. This condition is accompanied by a wide range of symptoms such as pain, weakness, and limited range of motion in the ankle joint. Lateral ankle sprains (LASs) are the most common injury incurred by collegiate football players, accounting for 31.4% of all lower body injuries. Consequently, evidence suggests that dynamic postural stability can be inversely affected by the presence of CAI. The purpose of this study was to determine if CAI negatively affects dynamic postural in college football players. Thirty college football players volunteered for this research (age=20.1±1.27 yr; body weight=105.06±20.7 kg; height=1.86±0.065 m). Fifteen participants with ankle instability who have a history of at least 2 ankle sprains or instances of giving away in the last 6 months are assigned to the CAI group. Fifteen participants with less than 2 ankle sprains or instances of giving away are assigned to the healthy control group. Time to stabilization tests (TTS) during single-leg jump landing was used to measure dynamic postural control. TTS is calculated using the peak ground reaction force (GRF) in the anterior/posterior and medial/lateral directions. An independent t-test was used to compare differences in TTS between CAI and the control group in anterior/posterior and medial/lateral directions separately. There was no statistical significance for TTS in medial/lateral direction (t(28)p=1.50, p=.144) and anterior/posterior direction (t(28)=.58, p=.57) between CAI and control group. Even though there was no statistical significance between groups, individuals with CAI took relatively longer to stabilize in the medial/lateral (2.02±.85 seconds vs. 1.59 ± .74 seconds). Possible limitations in this study include large variances in the BMI of participants. As well as not factoring in rehabilitation following an ankle sprain. Future research could be improved by implementing stricter recruitment for participants with similar BMIs and similar rehabilitation patterns following an ankle sprain.

3:40pm-5:00pm Jones

Poetry Reading by the Students of WRI 358 Poetry Writing Seminar

Lauren Richards, Isabel David, Emily Dexter, Wes Denney, Jerah Winn, Morgan Parrish, Shea Brown, Quinn Miersma, Thomas Kraus, Betsy Marshall, and Anna Wright, *Modern Language & Literature*

The students in WRI 358: Poetry will give a reading of original and favorite poetry as a fulfillment of the poetry course requirements. They will be performing a selection of free verse, form, and spoken word poems, some of which might be set to music.

3:40pm Bedford

Physiological Differences on a Standard Treadmill versus a Lower Body Positive Pressure Treadmill

Taylor Waterway, Lucy Martin, Ella Klhar, *Health and Human Performance*

The purpose of this research is to examine the physiological and psychological differences while running on a treadmill at full body weight compared to running at reduced body weight through a Lower Body Positive Pressure Treadmill (LBPPT). Researchers studied: heart rate (HR), blood pressure (BP), enjoyability, and rate of perceived exertion (RPE). To conduct this research, 30 participants (16 F/14 M) volunteered to run on both treadmills at two different times. Participants began with paperwork and then their resting HR and BP was determined. Then the participant ran the test. When this test terminated, HR, BP and RPE were determined, and the participant answered enjoyability questions.

The findings reported there was statistical significance between RPE on the standard treadmill (ST) versus the LBPPT. LBPPT reported significantly less exertion (<.001). This information corresponds to the HR that was significantly higher on the ST versus the LBPPT (<.001). A question asking about enjoyability was also significantly different on the LBPPT, concluding LBPPT was more enjoyable for participants (<.001). Systolic and diastolic BP found mean arterial pressure (MAP) to compare between the treadmills. MAP did not show statistical significance (.088), although trending in the direction of the hypothesis.

Furthermore, all reported values indicated that participants enjoy running on the LBPPT more, which was supported by a higher HR and a higher RPE reported on the ST. Further research should be done to determine what is enjoyable about the LBPPT and more participants used to see if the MAP value will show significance.

4:00pm Bedford

The Effect 100mg of Caffeine Has on Simple Reaction Time

Isaiah Henry, Christa Vogel, Alexis Weldy, and Jessica Keller, *Health and Human Performance*

Objective: The purpose of this study is to determine if consuming 100 mg of caffeine affects human reaction time in college-aged individuals.

Methods: 35 participants' reaction times were tested using the ruler drop test without consuming caffeine for at least 12 hours. The ruler drop test was performed using an apparatus to reduce potential anticipation. Then participants were given caffeinated chewing gum and chewed it for 10 minutes before retesting their reaction time.

Results: The results show a significant improvement in reaction time when comparing reaction time before and after caffeine ingestion. The results showed statistically significant improvements in reaction time from 2391 ms to 2253 ms on average when comparing before and after caffeine, respectively.

Conclusion: Ingesting 100 mg of caffeine did improve reaction time in college-aged individuals. Ingesting 100 mg of caffeine did improve reaction time in college-aged individuals.