Missouri State University

Welcome to the 24th Annual

McQueary College of Health and Human Services

Student Research Symposium

Hosted Virtually on Blackboard

from April 27-May 1, 2020

McQueary College of Health and Human Services

Student Research Symposium

Welcome to the twenty-fourth annual McQueary College of Health and Human Services Student Research Symposium. The purpose of the symposium is to promote student research as well as provide a forum for students to gain experience discussing their scholarly activities. This is an opportunity to celebrate our students' outstanding work and to acknowledge the faculty members who serve as mentors.

McQueary College of Health and Human Services (MCHHS) faculty, staff and students join me in thanking you for attending this year's symposium. Our students appreciate your interest in their work and look forward to discussing their projects with you.

I would like to thank the MCHHS Student Research Symposium Committee for their time and effort in organizing the symposium:

Dr. Ashlea Cardin, Occupational Therapy

Dr. Christie Cathey, Psychology

Dr. Melissa Fallone, Psychology

Dr. James Hackney, Physical Therapy

Dr. Tiffany Havlin, Social Work

Dr. Michael Hudson, Sports Medicine and Athletic Training

Dr. Anne Marie Hunter, Biomedical Sciences

Dr. Wafaa Kaf, Communication Sciences and Disorders

Dr. Bogdan Kostic, Psychology

Dr. Ruth Walker, Psychology

Dr. Jianjie Wang, Biomedical Sciences

Mr. Ian Alaimo, Technology Coordinator

Mrs. Sharon Harter, Administrative Assistant

Ms. Jacquelene Patterson, Executive Assistant

Mrs. Rebeca Reut-Robinson, Executive Assistant

Dr. Mark A. Smith

Dean, McQueary College of Health and Human Services

ORDER OF PRESENTERS (First Author)

1. Leah Brooke
2. Tashiana Mensch
3. Shaylen Harris
4. Alexa Palacio
5. Ashley Coonfield
6. Zachary Ingram
7. Sahar Gholami
8. Lydia Browning
9. Amanda Boswell
10. Stephanie Urich
11. Molly Bean
12. Austin Hess
13. Alicia Bresette
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17. Colton Herrell
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19. Ashley Coonfield
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21. Leanna Zelle
22. Hailee Marino
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27. Tess Johnson
28. Beri Glover
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32. Madison Mays
33. Rae Benner
34. Casey Moller
35. Stashia Casimir
36. Sara Cooper
37. Jo-Lynne Fairchild
38. Somer Bransfield
39. Ashley Carr
40. Jered Weger
41. Taylor Beadle
42. Katelynn Bratcher
43. Zachary Chapis
44. Aaron Crouch
45. Janie Flint
46. Madeline Hall
47. Erika Buckner
48. Demi Armstrong
49. Morgan Thompson
50. Samantha Bennett
51. Victoria White
52. Alec Schroff
53. David Smith
54. Breanna L. Alder
55. Erin Keethler
56. Abigail Ullo
57. Adam Schwent
58. Kirsten McFarland
59. Jantsen Lynn
60. Tiffany Lee
61. Bailey Williams
62. Tyler Priest
63. Victoria West Staples
64. Weston Phipps
65. Chynna Frizell
66. Laura Cox
67. Johnathan Sparks
68. Hannah Johnson
69. Kailey Meyer
70. Xin Wei Ong
71. Cassandra Kemmel
72. Cassandra Kemmel
73. Tegan Hoff
74. Kaylee Rucker
75. Whitney Akalugwu
76. Megan Overby
77. Lydia Nekula
78. Ashley Cancino
79. Hannah Pulse
80. Debadutta Goswami
81. Jennifer Gonzalez
82. Alex Harrison
83. Carly Beck
84. Jessica Ziegelbein
85. Jessie Hubbs
86. Kalen Davis
87. Krista N. Johnson
88. Jordan Newman
89. Austin Kuhl
90. JoJo Hudgings
91. Lyndsey Comer
92. Savannah Jochem
93. Colten Morgan
94. Nathanael Comer

Presenters and Faculty Mentors by Department and Abstract Number(s)

Biomedical Sciences

Presenters and Faculty Mentors by Department and Abstract Number(s)

Communication Sciences and Disorders

Kinesiology

Presenters and Faculty Mentors by Department and Abstract Number(s)

Occupational Therapy

Physical Therapy

Presenters and Faculty Mentors by Department and Abstract Number(s)

Psychology

Presenters and Faculty Mentors by Department and Abstract Number(s)

Public Health

Sports Medicine and Athletic Training

Presenters and Faculty Mentors by Department and Abstract Number(s)

BIOMEDICAL SCIENCES

1. Identifying Nutrition Knowledge Deficits in Collegiate Swimmers and Assessing Group Intervention Strategies

Leah Brooke, RDN, LD
Faculty Advisor: Natalie Allen

Nutrition is an important part of an athlete's strategy to improve health and performance. Research indicates 80% of athletes do not consume enough carbohydrates to meet recommendations. There are many resources for nutrition information, but athletes struggle to find accurate and consistent information to guide them in diet decisions. This research study focused on 32 collegiate swimmers who completed an online survey. Currently, MSU athletic team meetings conducted by team dietitian are general, providing overall nutrition knowledge. Based on the findings, tailored smaller group messages could improve education and be utilized with collegiate sports nutrition programs. The diet questionnaire showed 73.2% and 68.3% of athletes were not consuming adequate vegetable and fruit servings daily, respectively. Other areas of concern were low dairy intake and inadequate hydration methods. Therefore, subsequent team meetings focused on fruit and vegetable intake, calcium sources, proper fluid intake, appropriate portions, new recipe ideas and nutrition apps. In conclusion, utilizing an online survey prior to group team meetings will allow team RDNs to tailor messages specific to athletes' needs.

2. Non-Invasive Prenatal Testing

Tashiana Mensch, Amanda Brodeur
Faculty Advisor: Amanda Brodeur

Non-Invasive Prenatal Testing (NIPT) is a test offered to pregnant women across the world. It is a blood test performed on the mother that carries no risk to the fetus. Still, there are many who are lack necessary information about NIPT. This lack of information leads some to believe that the outcomes of testing are limited to pregnancy termination. This poster will present background about NIPT, including the indications, methods, potential results, and patient decision making as a result of NIPT. Information will also be presented on alternative prenatal test. It is hoped that participants will become more informed on NIPT and aware of common misconceptions.

3. Influenza Virus: Epidemiology, Pathobiology, and Prevention

Shaylen Harris, Justin Polites, Allison Carder, Jordan Bougher, Amanda Brodeur
Faculty Advisor: Amanda Brodeur

One of the major global health concerns causing a threat to the human population is the influenza virus. The severity of influenza varies greatly with the most severe outcomes present in the elderly, children, pregnant women, and immunocompromised. Possible symptoms associated with influenza include: fever, chills, cough, runny nose, body aches, headaches, and fatigue. Due to the unpredictable nature of which influenza strain(s) will be present each flu season and the difficulties of treating this condition, it is necessary that precautionary measures must be taken to avoid the detrimental effects that influenza can have on the population. A major preventative method includes the use of vaccines. Vaccines introduce a strain of weakened virus that the body is able to eliminate, and in doing so the immune system is now able to recognize this foreign invader more readily. This poster will focus on information regarding influenza, the severity of this global health concern, and advocate for the use of vaccines as a necessary preventative measure to be taken.

4. Further Characterization of the Skeletal Phenotype in Idua-W392X Knock-In Mice as a Model of Mucopolysaccharidosis Type I

Alexa Palacio, Austin M. Sullivan, Jennifer A. Heidle-Dalton, Taylor N. Fax, Grace E. Scherschel, Tyler A. Bates, Anna McWoods, Amanda Brodeur
Faculty Advisor: Amanda Brodeur

Mucopolysaccharidosis type 1 (Hurler syndrome) is a rare, autosomal recessive disorder caused by the deficiency in the lysosomal enzyme alpha-L-

iduronidase (IDUA). Hurler syndrome is characterized by cognitive disabilities, hearing impairment, and organ enlargement. Additionally, patients exhibit degenerative joint disease and bone deformities. It is a progressive disorder that involves multiple organ systems and leads to early neurological decline and death in childhood, if not treated. To improve quality of life, there are therapeutic options available. Despite available treatments improving the majority of symptoms, there are minimal improvements in the bone phenotype. As a result, diagnosed individuals continue to experience disabling, painful bone disease that often requires intense surgical intervention. Our lab examines the bone phenotype using a knock- in mouse model. In this study we demonstrate the ability to decalcify, fix, embed, and stain murine long bones. Immunohistochemistry examining RANK-L and osteoprotegerin was performed to examine osteoclast function in the mouse model. The aim of this study is to gain a greater understanding of the bone phenotype seen in Hurler syndrome through this procedure.

5. Antibiotic Resistance: A Growing Global Health Concern

Ashley Coonfield, Callyn Broyles, Carsten Warner, Jesie Maddox, Richard Garrad
Faculty Advisor: Richard Garrad

Antibiotic resistance is a growing threat to global health. Its effect on the population increases yearly due to factors like over prescribed antibiotics, patients not finishing their entire antibiotic course, and overuse of antibiotics in livestock. These things and others; have led to bacteria becoming resistant towards antibiotics to which they were previously sensitive. Among bacteria that have been labeled as an urgent threat by the CDC are C. difficile, which can cause life-threatening diarrhea, and N. gonorrhoeae, also known as drug-resistant gonorrhea. This poster summarizes the extent of the problem, the mechanism of resistance, methods to prevent resistance, along with what has led to this resistance. Current research on the topic involves new targets for antibiotics like quorum sensor biosynthesis, biofilm synthesis, and isoprenoid biosynthesis. This problem will only continue to worsen over time as more strains of bacteria become resistant and unless changes are made globally, the UN estimates that resistant infections could kill 10 million people yearly by 2050.

6. An ImageJ Macro for Analyzing Intensity of Overlapping Signals

Zachary Ingram, Hannah Matheney, Courtney Weatherford, Emma Wise, Amy E. Hulme
Faculty Advisor: Amy E. Hulme

An estimated 1.1 million people are living with HIV in the United States. Understanding the replication steps of HIV may lead to new treatments. We are investigating the uncoating step of HIV replication with the In Situ Uncoating Assay. This assay uses virus that contains two fluorescent proteins to visualize the viral complex in cells. CHME3 microglial cells are infected with this virus and fixed during a time course. The viral capsid is detected by antibody staining to determine the extent of uncoating. Cells are then visualized by confocal microscopy so that viruses can be counted and sorted into different groups. Manually counting viruses is time consuming with hundreds of viruses in each experiment. Therefore, we developed an automated counter macro in Fiji. In this macro viral particles are automatically identified and the shape, size, brightness, and color combination are recorded. Results from this macro were in close agreement with manual counting. Importantly, time of analysis was drastically shortened with an easy to use interface and adjustable settings. While this software was designed for the In Situ Uncoating Assay, these adjustable settings allow for use in other co-localization experiments.

7. Differential Infectivity of HIV-1 Capsid Mutants with Cyclophilin A Interaction

Sahar Gholami, Trudy Merritt, Arnela Pekic, Amy E. Hulme
Faculty Advisor: Amy E. Hulme

Since 1981 an estimated 74.9 million people have been infected by HIV, yet we still do not fully

understand the mechanism of HIV-1 replication. HIV-1 infection is facilitated by the host cell factor Cyclophilin A (CypA) in some cell types. Prior research has shown that some capsid mutations of HIV-1 result in viruses that do not require CypA for infection. The purpose of this experiment was to analyze infectivity of the A92E, E45A, E45A/R132T and N74D capsid mutant HIV-1 viruses with or without CypA interaction. Microglial (CHME3) cells were infected with a mutant or wildtype (WT) HIV-1 GFP reporter virus in the presence or absence of CsA to block CypA interaction. Viral infectivity was then analyzed using flow cytometry. The infectivity of the A92E mutant was restricted by the inhibition of CypA, similar to WT virus. In contrast, the N74D mutant showed increased infectivity during CypA inhibition over WT virus. Experiments with the E45A and E45A/R132T mutant viruses are still ongoing. This study provides evidence that CypA inhibition in microglial cells restricts infectivity of WT and A92E HIV-1 virus, but enhances infectivity of the N74D mutant virus.

8. Level of Diabetes Knowledge Among College Students

Lydia Browning, Rebecca Maloney, Hannah Peters, Baylee Reller, Ian Washington
Faculty Advisor: Anne Marie Hunter

Diabetes mellitus affects many individuals worldwide, but stigma related to the disease may negatively impact prognosis and mental health in Type 1 and Type 2. The purpose of this research was to distinguish between diabetes knowledge of Health and Human Services students versus members of the overall student population. Nine questions were administered to 36 MSU students through the Survey Monkey website. Participants from each college were as follows: one-third from Natural and Applied Sciences; one-third from Health and Human Services; one-third from Agriculture, Arts and Letters, Business, and Humanities and Public Affairs collectively. Fourteen participants correctly answered knowledge-based questions about nutrition and differences between Type 1 and Type 2 diabetes. Natural and Applied Sciences participants answered 63.3% of questions correctly; Health and Human Services students answered 62.5% correctly. Data was analyzed using descriptive statistics to generate a mean, z score, standard deviation, and p value. Results were not significant ($p=0.18$) due to sample size, but the study could be replicated to include more participants. Further research must determine effective methods of diabetes education, to reduce stigma.

9. Use of Workout Supplements in College Students

Amanda Boswell, Maggie Goss, Rebecca Milton, Sarah Polk, Austin Ruesink
Faculty Advisor: Anne Marie Hunter

Workout supplements are an increasingly popular dietary fad among young people. Individuals spend large amounts of money on supplements that are nutritionally unnecessary, federally unregulated, expensive, and questionably safe or beneficial. This research project examined the use of pre- and post-workout supplements in college students. Sixty-five university students were surveyed using Survey Monkey, using a Likert scale and percentage analysis to determine the use and knowledge of workout supplements. The survey included questions about the students' demographics including age (88% ages 21-22; N-57), gender (88% female; N-57), and major (26% athletic training, N-17); (14% nursing, N-9) and (8% dietetics, N-5). The students were also asked about their fitness goals, weekly physical activity, current knowledge on supplement use, as well as their use and type of workout supplements in the past. The data analysis showed supplement use among the students (58% never used them, N-38); (22% used them sometimes, N-14); (8% used them all the time, N-5) and an overall low knowledge rating about the use of supplements (45% fairly knowledgeable, N-30) and (7% absolutely no knowledge, N-4).

10. CHIP-ing for Better Health: A Lifestyle Intervention for University Employees

Stephanie Urich, Daniela Novotny
Faculty Advisor: Daniela Novotny

Despite advances in health care, rates of chronic diseases remain high in the United States. The Complete Health Improvement (CHIP) is an evidence-based lifestyle intervention program that can be implemented in wide array of settings. Research has suggested CHIP may improve dietary habits, exercise behaviors, destructive reactions to stress, biometric markers, and quality of life. The aim of this study was to assess the effects of CHIP on chronic disease risk factors in Missouri State University employees. This 9-week dietitian-led intervention study examined anthropometric and laboratory measures, eating behaviors, activity patterns, stress levels, and the overall satisfaction of 34 CHIP participants. Participants completed pre- and post-CHIP health screens as well as periodic evaluative surveys. Significant improvements were found for BMI, waist circumference, systolic blood pressure, total cholesterol, LDL cholesterol, and triglyceride levels. Additionally, fasting blood glucose, hemoglobin A1c, and diastolic blood pressure were markedly improved. Participants were extremely satisfied with CHIP, were likely to keep CHIP principles a permanent part of their lives, and were pleased their employer offered CHIP.

11. Acceptability of Fiber-Fortified, Antioxidant-Rich Rooibos Tea Sorbet Developed for Geriatric Population

Molly Bean, Lydia Browning, Austin Ruesink
Faculty Advisor: Deborah Piland

Fiber is an important component of a healthy diet, especially in those ages 50 and older. On average, older adults consume somewhere between 15-17g fiber per day, which falls short of the 25-38g recommended by the 2015-2020 Dietary Guidelines for Americans. Additionally, antioxidants benefit the geriatric population by reducing oxidative damage due to aging and chronic inflammatory diseases. The purpose of this study was to determine the acceptability of a fiber fortified, antioxidant-rich Rooibos tea sorbet geared toward the geriatric population and those on texture-modified diets. A quantitative 5-point sensory evaluation and Likert scale survey was used to rank and evaluate four Rooibos sorbet variations. Thirty-one participants were surveyed at Missouri State's Semi-Annual Cooking Demonstrations. Overall, the results determined that most participants (40.3%) ranked the lower fiber, lower rooibos tea concentration sample as their favorite for taste/flavor, mouthfeel, and overall acceptability. A majority of participants (71.0%) indicated that they would be more likely to purchase the product if it claimed specific health benefits. This study determined that Rooibos tea sorbet is an acceptable source of fiber and antioxidants.

12. Acceptability of Vegan Muffins with Added Omega-3 Fatty Acids

Austin Hess, Hannah Peters, Austin Sullivan
Faculty Advisor: Deborah Piland

Omega-3 fatty acids are polyunsaturated fatty acids known to reduce inflammation in the body. Typical fat intakes in the U.S. show a pro-inflammatory ratio of omega-6 to omega-3 (15:1 to 17:1). However, a 6:1 ratio is desirable for health, and it is important to determine the acceptability of food products that may reduce inflammation. The purpose of this experiment was to determine the acceptance of vegan banana walnut muffins containing omega-3s from various sources. Muffins tested varied in type and quantity of oil: soybean oil, canola oil, increased amount of walnut oil, reduced amount of flaxseed oil. A mixture of 1 TBS chia seeds and 2 TBS water was used as an egg substitute in all variations. Twenty adult participants from DTN 331 Food Science and MSU Employee Wellness Program conducted sensory analysis of the products. The walnut oil muffin scored highest in overall acceptability (4.2 out of 5), flavor (4.25 out of 5), and aftertaste 4.2 out of 5). Each 25g walnut oil muffin contained 0.47 grams of omega-3s, more than double that in the baseline soybean oil muffin. Increasing omega-3s with chia and non-traditional oils appears to create an acceptable product for those wishing to consume an anti-inflammatory diet.

13. Determining the Acceptability of Added Beetroot Powder in Energy Bites

Alicia Bresette, Asana Rimal, Christi Mackey, Min Zhang
Faculty Advisor: Deborah Piland

Studies highlight the anti-inflammatory response of beetroot powder and vascular benefits due to dietary nitrate content. Dietary nitrates assist with blood pressure control and enhancing exercise performance. The objective was to explore the acceptance of varying amounts of beetroot powder in energy bites. Samples were provided with three levels of beetroot powder. The panelists evaluated the samples on flavor, texture, aftertaste, acceptability and likeness. The participants were asked to rate these areas on a scale of 1 to 5 with 1 being not very likely and 5 being very likely. The results showed the sample containing the lowest amount of beetroot powder was preferred by 54% of the participants, and 25% of the participants preferred the sample with moderate beetroot powder. The mean value for flavor, texture, aftertaste, overall acceptability, and likeness of low amounts of beetroot powder include 3.9, 4.25, 3.85, 4.14, and 4.5, respectively. The mean value for flavor, texture, aftertaste, overall acceptability, and likeness of moderate amounts of beetroot powder include 3.78, 3.7, 3.75, 3.7, and 4, respectively. The majority of participants indicated they would likely eat this product to enhance their athletic performance.

14. Acceptance of Matcha Green Tea Powder Fortified Pancakes for Those Wanting to Increase Their Antioxidant Intake

Brianna Becherer, Megan Mebruer, Joshua Zimmerman
Faculty Advisor: Deborah Piland

Scientific evidence suggests reactive oxygen species may increase the development of chronic diseases, like cardiovascular disease, neurodegeneration, and cancer. Matcha Green Tea is rich in antioxidants called polyphenols, which may help lower chronic disease risk. Walnuts were included to increase omega-3 fatty acid content, due to their health properties include reducing inflammation and heart disease. This experiment explored the acceptance of adding matcha powder in pancakes for people looking to increase antioxidant intake. Qualitative sensory analysis hedonic scales were used to evaluate acceptance of products with varying amounts of matcha powder. Twenty five adults evaluated the pancakes on flavor, appearance, texture, and aftertaste. Results showed that 60% of individuals preferred the pancake with the lowest amount of matcha added over those with higher levels. Most adults stated they would consume matcha pancakes for health benefits. The proposed health benefits of antioxidants and omega-3 fatty acids in the matcha pancakes was the most important factor when determining if participants would consume the pancakes again. Overall, these pancakes are great for adding antioxidants and omega-3 fatty acids to a diet.

15. A Case Study of Nutrition Training for Support Staff: Promoting Fruit and Vegetable Intake for People with Intellectual Developmental Disabilities

Macy Wendling
Faculty Advisor: Hillary Roberts

This study investigated effects of online nutrition training on nutrition knowledge of staff and frequency of fruit and vegetable offerings in client homes. Nutrition training was provided to The Arc of the Ozarks, Joplin staff over five weeks via weekly online modules. Fruit and vegetable offerings were recorded by staff and analyzed with NIH Automated Self-Administered Recall System. Nutrition knowledge was assessed post-modules and pre/post-study via Qualtrics' surveys. Pending results, knowledge and food frequency data will be presented. Prevalence of intellectual developmental disabilities (IDD) increased 17.1% from 1997 to 2008 (CDC, 2015). People with IDD are at higher risk of developing obesity than the general population partly due to behavior characteristics associated with IDD—limited food acceptance, favoring highly processed foods, reduced intake of fruits and vegetables—resulting in high energy, low nutrient diets. These characteristics coupled with

inactivity, medication regimens, nutrition knowledge deficits of gatekeepers, and lack of diet monitoring contribute to weight gain. Similar programs often lack a registered dietitian or nutrition training of staff. Data may be used as evidence for similar programs.

16. A Novel UV Resistance in RAD23 Depleted Tetrahymena Thermophila

Emily Schmoll, Joshua Smith
Faculty Advisor: Joshua Smith

Rad23 is a highly conserved cellular scaffold protein which participates in the nucleotide excision repair pathway and ubiquitin proteasome system. It is hypothesized that the contradictory roles of Rad23 within these two systems, acting to enhance stability or facilitate degradation respectively, could be regulated via post-translational modification of the ubiquitin-like domain of the protein. To this end, a Rad23 somatic knockout cell line was established in Tetrahymena thermophila, with the eventual goal of knocking in a mutant Rad23 protein lacking potential for UbL ubiquitylation. In contrast to the UV-sensitive phenotype observed in similar models, Rad23-depleted Tetrahymena cell lines displayed significantly increased resistance to UV irradiation. While the mechanism of this survivability remains poorly understood, this model may shed new light on potential compensatory DNA repair mechanisms, pathways of failed apoptotic induction, or additional novel roles of the Rad23 accessory protein that have yet to be explored.

17. Alligator Hind-Limb Non-Linear Locomotion and 3-D Animation

Colton Herrell, Henry Tsai
Faculty Advisor: Henry Tsai

Archosaurs, a group which includes birds, crocodilians, and dinosaurs, employ a diversity of articular soft tissues in constructing their limb joints, likely corresponding to the shape, size, articulation, and mobility of the joints themselves. This study examined the articulation and kinematic relationship of the alligator's hip joint during terrestrial maneuvering (non-forward locomotion) behaviors using XROMM (X-ray Reconstruction of Moving Morphology). Three juvenile alligators received metallic maker implants in the pelvic and hind limb bones. After recovery, the animals were filmed using bi-planar X-ray as they were stimulated to perform maneuvering behaviors in a foam-board arena. We then used the tracked motion of the markers to animate 3D bone and cartilage models of the alligator's hind limb skeleton in the animation program Maya, which allowed isolated observation of three-dimensional joint motion without intervening skin and muscles. The alligator's hip joint partially dis-articulated during in-vivo turning and leaping behaviors, with the femoral neck dis-articulating from the antitrochanter during hip abduction and medial rotation. Our results showed the articular relationship is more complicated than first inferred.

18. Challenging Glucose Metabolism with Acute Inflammation and Absence of the P2Y2 Receptor

Christian Rivas, Erin Snyder, Hailee Marino, Nathan Johnson, Taylor Lynch, Jianjie Wang, Randi Ulbricht
Faculty Advisor: Randi Ulbricht

The P2Y2 receptor is a purinergic receptor known to promote inflammation. Activating the P2Y2 receptor with extracellular purines such as UTP has shown to decrease glucose metabolism. Acute inflammation from viral infection or injury is also known to decrease glucose metabolism. Our study sought to link the P2Y2 receptor with inflammation and glucose metabolism. We examined the metabolism in female mice that are wildtype or missing the P2Y2 receptor when challenged with a reagent that causes acute inflammation, lipopolysaccharide (LPS). Wildtype/knockout pairs of mice were injected with saline or LPS, and fasting blood glucose was measured 24 hours after injection. The mice were given glucose and their blood glucose was measured 7 times in 90 minutes. Our results show that the mice that received LPS had lower blood glucose levels, consistent with increased metabolism. The mice show no differences between genotypes, consistent with

previous results. We expect similar experiments in male mice will produce equal results, but the males will have a genotype-dependent difference in metabolism. These studies will provide information on sex-dependent metabolism differences and link the P2Y2 receptor to glucose metabolism and inflammation.

19. RNA Editing of FLNA and Inflammation in Mouse Cardiac Tissue

Ashley Coonfield, Claire Nicholes, Megan Lackman
Faculty Advisor: Randi Ulbricht

A to I RNA editing is a process in which adenosine nucleotides are deaminated to become inosines in the affected RNA transcript. In transcripts like FLNA, an inosine is recognized as a guanine, which results in a variation in the final protein product in which a glutamine is changed to an arginine residue. Inflammation increases the amount of enzymes that catalyze RNA editing. The goal of our work is to determine if inflammation has an effect on FLNA RNA editing levels in the heart tissue of mice. The inflammatory response in the mice was induced by injecting them with LPS, which mimics a bacterial infection. It is predicted that this inflammation will increase the amount of editing taking place resulting in an increased percentage of edited transcripts in the flu-infected and LPS-injected mice versus the untreated mice. FLNA plays a vital role in heart tissue and blood vessel formation. Therefore, the increased percentage of editing under inflammatory conditions may be an adaptive mechanism that can aid in protecting the heart during stress or diseased conditions.

20. RNA-Editing of CAPS1 Transcript and its Effects on Secretion of Hormones

Kaylee Mathiason, Randi Ulbricht
Faculty Advisor: Randi Ulbricht

Calcium-dependent activator protein for secretion 1 (CAPS1) stimulates regulated secretion of hormones and neurotransmitters. Prior to translation, the CAPS1 mRNA is modified through RNA editing, which results in a glycine to glutamic acid conversion in the protein. Replacing CAPS1 with solely edited forms increases secretion, though it is unclear whether the frequency of RNA editing can be manipulated in a more subtle way, or whether these events affect secretion from the cell. We use Cas13 to manipulate RNA editing of the CAPS1 transcript in endocrine and brain-derived cultured cells. The amount of fluorescently-tagged Phogrin secreted into the media will be used to measure secretion when editing is manipulated, or when we overexpress the non-edited and edited versions of CAPS1. We expect increased edited CAPS1 to increase secretion. These results will indicate manipulating RNA editing within a cell is possible, and may assist in experimental or therapeutic applications where secretion plays a key role. Results may also indicate a potential therapy for patients with Type II Diabetes, since insulin and Phogrin are secreted similarly from endocrine cells in the pancreas.

21. Endoglin Expression in Mouse Microvascular Endothelial Cells

Leanna Zelle, Jianjie Wang
Faculty Advisor: Jianjie Wang

Endoglin (CD105) is a transmembrane marker in mammalian vascular endothelial cells. Little is known of basal level expression of CD105 in microvascular endothelial cells (MEC). This project aims to assess expression of key molecules in MEC. MEC were isolated from microvessels of skeletal muscle in C57BL mice. The basal expression of CD105 will be quantitatively measured using flow cytometry. Optimization of the secondary antibody PE Streptavidin was performed using a series of dilutions. CD105 plays an important role in angiogenesis and wound healing. Given that inflammation is associated with angiogenesis, we hypothesized CD105 expression level increases in MEC under inflammatory conditions. We will test CD105 levels in MEC treated with endotoxin lipopolysaccharide (LPS) and pro-inflammatory mediators, TNF-alpha and thrombin. Angiogenic properties of MEC will be confirmed by VEGFR-2 expression. Nucleotide P2Y2R modulates angiogenesis via VEGF-dependent pathways. We

will determine the influence of P2Y2R on CD105 expression in WT MEC stimulated with UTP, a P2Y2R agonist, and in P2Y2R KO MEC. To test its role in angiogenesis, capillary-like tube formation assay will be performed using anti-CD105 antibody in WT and P2Y2R KO MEC.

22. The Role of the P2Y2 Receptor in Glucose Tolerance

Hailee Marino, Randi Ulbricht, Jianjie Wang
Faculty Advisor: Jianjie Wang

The P2Y2 receptor is important in mediating vascular inflammation. Recent studies suggest P2Y2R involvement in high fat diet-induced metabolic abnormality; however, physiological role of P2Y2R is unknown. We investigated P2Y2R in glucose metabolism under physiological conditions. We assessed fasting blood glucose (FBG) and glucose tolerance in C57BL/6 and P2Y2R-/- mice. Fasted for 5 hours, mice received intraperitoneal injection of 20% dextrose (2 g/kg BW). Blood was obtained from the tail to assess glucose levels using a glucometer at 8 time points between 0 (fasting) and 90 mins after dextrose injection. We found no significant changes in FBG between WT and P2Y2R-/- in both males and females. Impaired glucose tolerance in P2Y2R-/- mice was only observed in male while females exhibited comparable glucose tolerance between genotypes. We also found sex differences in FBG and glucose tolerance in WT mice. Contrarily, in P2Y2R-/- mice sex difference only in glucose tolerance was observed. Females in both groups exhibited better glucose tolerance relative to males. Overall, the findings demonstrate P2Y2R plays a role in regulating glucose tolerance in males, and males and females differs in FBG and glucose tolerance in WT mice.

23. In Vivo P2Y2R Role in Leukocyte-Endothelium Interaction after LPS-Activated Inflammation

Sharon Sheravina, Christian Rivas, Erin Snyder, Ashleigh Baker, Crystal Nguyen, Randi Ulbricht, Jianjie Wang
Faculty Advisor: Jianjie Wang

Leukocyte-endothelium interaction is a hallmark of an inflammatory process. Lipopolysaccharide (LPS) increases cytokines and danger signal release to activate their receptors. Our previous work showed nucleotide P2Y2R, potently activated by ATP/UTP, promotes leukocyte rolling and adherent to endothelium under basal condition. However, the role of P2Y2R in regulating leukocyte-endothelium interaction under inflammation induced by LPS is unknown. We hypothesized that LPS potentiates UTP-induced leukocyte-endothelium interaction. In vivo leukocytes labeled with Rhodamine-6G in venule (25-40 μm) of mouse cremaster skeletal muscle were recorded with intravital microscopy. Three groups of mice received 0.05 ng, 0.15 ng, and 0.3 ng of LPS intrascrotal injection, respectively. The leukocyte flux, rolling, and adhesion were measured in C57BL/6 and P2Y2R knockout mice treated with UTP (10-7, 10-6, 10-5, and 10-4 M) following 4 hrs after LPS injection. The leukocyte movement was recorded at 0, 5, and 10 min during UTP superfusion at each dose. The flux, rolling, and adhered leukocytes in mice received LPS injection were compared with the saline injection group under the same conditions, and data were analyzed using two-way ANOVA in SPSS.

24. Addressing Lack of Clean Water in Sub-Saharan Africa

Matthew Freese, Leah Krafft, Tashiana Mensch, Zachary Wattles, Julie Whitten, Colette Witkowski
Faculty Advisor: Colette Witkowski

Clean food and water is taken for granted in many American homes, but lack of access to safe resources remains a major health concern for families across the globe. According to the World Health Organization, over 2.2 billion people went without reliable access to safely managed water in the year 2017. They estimate that by 2025, nearly half of the world's population will be living in water-stressed areas. While this a global concern, Sub-Saharan Africa is among the most water-stressed areas in the world, and many communities regularly go without access to clean water and stable

food sources. Here we analyze some of the common causes of food/water insecurity, address the prevalence of the issue worldwide, illustrate the pathogenicity linked to unsafe consumption, and offer information on some of the organizations working towards real, applicable solutions. Only through the dissemination of intentional education, and persistent discussion of these difficult topics, can we hope to make a real impact in reducing this problem for humankind.

COMMUNICATION SCIENCES AND DISORDERS

25. Implications of Using Passy-Muir Speaking Valves for the Development of Speech and Language in Pediatric Populations

Ashton Bernskoetter
Faculty Advisor: Klaas Bakker

When a tracheostomy is performed, the air passes through the stoma created in the anterior region of the neck, thus diminishing the capability to use one's voice in a typical manner. Infants and young children who require tracheostomy do not get practice making speech sounds as same-aged peers do, which may lead to speech and language delays. Currently, there are several methods for individuals with tracheostomy to use their voice. Among these options, speaking valves are an optimal solution for the pediatric population as they do not require the coordination of manual occlusion of the tracheostomy tube. A challenge facing SLPs who provide services to pediatric tracheostomy patients is that they often face complications that reduce their tolerance for effectively utilizing a speaking valve. This paper details the complications which prevent the successful implementation of speaking valves in pediatric populations when trying to create an alternative way to use their voice and allow them to begin their speech and language development.

26. Learning about Counseling In College or in The Work Field: A Survey of Speech Language Pathologists in Medical Settings

Megan Cole, Amielia Wolz
Faculty Advisor: Klaas Bakker

According to the American Speech Language and Hearing Association, it is within the scope of practice for speech language pathologists to provide counseling; specifically related to patients' communication, cognitive, and swallowing difficulties. However, there is no requirement for counseling training in graduate programs and limited research is available related to the type of training best fit for counseling in communication disorders, or effectiveness of counseling provided by speech language pathologists in medical settings. This paper describes thoughts and reactions related to counseling of speech language pathologists currently practicing in medical settings collected via an anonymous survey. Responses consist of open ended and multiple choice questions with a closed set of options regarding: counseling, training the respondents received in their graduate programs, experiences with counseling during practice, continuing education courses related to counseling, and their opinion as to whether or not training in the area of counseling should be a requirement of graduate programs. Ramifications for the need to provide training in counseling during academic preparation will be discussed.

27. Potential Consumers' Perceptions Towards Over-the-Counter Hearing Aids

Tess Johnson, Shelby Davis
Faculty Advisor: Shelby Davis

Purpose: The primary objective of this study was to determine if there is a significant relationship between potential consumers' self-categorization of hearing loss and their perception towards OTC hearing aids (OTCs). The secondary objective was to evaluate potential consumers' general perceptions towards OTCs.
Methods: The Over-the-Counter Hearing Aids (OTCHA) survey was completed by 91 individuals who were aged 18 years or older, had a

perceived hearing loss, and lived in the Midwestern United States.
Results: Males are more willing to purchase OTCs than females; however, age and household income did not have any effect on willingness to purchase. Self-categorization of hearing loss does not have an effect on neither perception towards OTCs nor willingness to purchase OTCs. Of the participants who indicated that they would purchase an OTC, 67% indicated that they would most likely purchase it from a hearing care provider over the other choices offered.
Conclusions: This research can help to inform professionals about some of the patients' perspectives on OTCs. These results also signify the value that consumers place on the hearing care provider's role in the process involved in selecting and fitting amplification devices.

28. The Effects of Auditory Acclimatization on Acceptable Noise Levels in Males

Beri Glover
Faculty Advisor: Thomas C. Franklin

The Acceptable Noise Level, ANL, is a measurement that places a value on an individual's willingness to tolerate background noise while listening to speech (Nabelek, Tucker, & Letowiski, 1991). This study seeks to determine if ANL can be manipulated by acclimatization to noise by exposing male participants to speech babble for thirty minutes and measuring their ANL before and afterwards. Participants included twenty men with normal hearing sensitivity and normal middle ear function within the Springfield, MO area. Results did not show a statistically significant difference in ANL values after exposure to thirty minutes of babble noise, however, a statistically significant difference was observed for the most comfortable (MCL) and uncomfortable listening level (UCL). Further exploration of this topic can contribute to better hearing aid fittings and adjustments.

29. Neuromodulation Therapy for Tonal Tinnitus Using Desyncra Device

Jenna Wheeler, Wafaa Kaf
Faculty Advisor: Wafaa Kaf

The use of Desyncra CR® Neuromodulation therapy device over time has been theorized to alleviate chronic, tonal tinnitus, which impacts millions. This study aims to assess the effect of the Desyncra device on two adult participants (P1 and P2) with chronic, tonal tinnitus. Participants met inclusion criteria; hearing evaluation, tinnitus pitch matching, and questionnaires. Baselines were obtained prior to neuromodulation therapy and the Desyncra device set to deliver four therapy tones centered around the tinnitus pitch match. Each participant was to wear the device no less than 6 hours/day. Follow ups/programming occurred triweekly for 39 weeks using Desyncra software to track usage, changes in pitch match, and questionnaires. Participants completed 39 weeks of therapy, but with conflicting results. P1 experienced significant alleviation of tinnitus loudness and annoyance. P2 did not show improvement, likely due to inconsistent usage. Findings suggest that consistent use of the device for 39 weeks reduces the effect of tinnitus.

30. Comparison of Multi-Rate ASSR to Narrow-Band Chirp and Behavioral Thresholds in Adults with Normal Hearing and Sensorineural Hearing Loss

Danae Foster, Hannah Tether, Wafaa Kaf
Faculty Advisor: Wafaa Kaf

Auditory evoked potentials are objective measures to diagnose hearing loss in difficult-to-test populations who cannot respond to standard hearing tests. Auditory brainstem response (ABR) is the gold standard for this purpose whereas the auditory steady-state response (ASSR) is used to supplement ABR. However, relatively poor estimation of true hearing sensitivity is an issue with ABR. This study aims to investigate and compare two novel protocols for hearing threshold testing using ABR and multi-rate ASSR to low-, mid-, and high-narrowband chirps. ABR and ASSR thresholds were recorded bilaterally using two channels: high forehead to nape

of neck and nazion as the ground from 15 adults with normal hearing and 12 adults with sensorineural hearing loss (SNHL). ABR and ASSR thresholds were compared with behavioral hearing thresholds. ASSR and ABR thresholds were not significantly different and were in close agreement of behavioral thresholds (12-16dB) in the normal hearing group, but ABR thresholds were up to 10-20dB poorer than ASSR and behavioral thresholds in the low frequency range in the SNHL group. ASSR and ABR tests provided accurate estimation of behavioral thresholds, and multi-rate ASSR may be used as a standalone test.

31. Methods for Teaching Skilled Phonetic Transcription in Speech-Language Pathology Undergraduate and Graduate Programs

Kara Copling, Reagan Caldwell, Mackenzie Depee
Faculty Advisors: Sarah Lockenvitz and Lisa Proctor

Speech-Language Pathologists treat a variety of communication disorders, including sound system disorders. To do this, they need to accurately and efficiently assess the clients they serve, which often involves phonetic transcription. Phonetic transcription instruction typically starts at the undergraduate level and concludes at the graduate level. A review of current research literature will provide information regarding methods for instruction to develop competency, clinical use of phonetic transcription skill, and professional satisfaction of instruction. This information is essential in developing relevant and effective materials for demonstrating competency at the graduate level in preparation for the working field. The Missouri State University Speech-Language Pathology graduate program intends to create updated phonetic transcription proficiency materials based on literature findings for the benefit of future students.

32. The Effect of Enhanced Environments on Engagement of Persons with Dementia During Collective Story Generating Activities

Madison Mays, Sarah Christoff; Brittany Rector; Kelsey Garbee
Faculty Advisor: Alana Mantie-Kozlowski

Objective- To determine whether enhancing environments through amplification will increase engagement of persons with dementia during collective story generating activities. Study design- This study presents five case studies. An ABBA design was used. Setting- Dementia unit within skilled nursing facility. Participants- Four female cases and one male case are presented. In all cases, the participants had a diagnosis of dementia and resided in a secured "dementia-unit" of a skilled nursing facility. Intervention- All subjects participated in modified TimeSlips group story-generating activities. Main Outcome measure- Group Observational Measure of Engagement (GOME). Results- Data reflects levels of engagement and participation of the five case study participants during amplified and non-amplified sessions. Engagement and participation of members were inconsistent. Conclusion- We were unable to demonstrate increased engagement of participants when amplification was used. The skilled nursing environment for group therapy intervention contained many environmental factors that acted as confounding variables in the research study.

33. Disability Support Staff and Students with Chronic Illness in Higher Education

Rae Bennett
Faculty Advisor: Alana Mantie-Kozlowski

Students with chronic illnesses (CI) pursuing post-secondary education face unique challenges; therefore, accommodation services play a critical role in student success. Disability Support Staff (DSS) work directly with students with CI and help them navigate the accommodation process. This experiential exploratory study presents findings from interviewing DSS from various higher education institutions regarding their experience working with individuals with CI. Themes to be

discussed include: collaboration with other universities/professionals, mediating between the students and faculty, policy/legislature and how that impacts students, and DSS' role in creating resources/advocating for students.

34. A Survey for Speech-Language Pathologists and Their Perspectives on Graduate School Programs

Casey Moller, Carly James, Emily Herschleb, Alana Mantie-Kozlowski
Faculty Advisor: Alana Mantie-Kozlowski

Graduate students in speech language pathology (SLP) programs report experiencing high levels of stress as they progress through their training, often higher than other college age peers (Tilstra, Coffman, Gonia, Koziol, and Liebe, 2019). Resilience to this stress may come in the form of mentoring and professional networks, and having a sense of meaning in life (Tilstra et al., 2019). This study presents the reflections of SLPs with at least 3 years of work experience regarding their graduate training including aspects of course content, faculty and/or supervisor interactions, expectations of the program, the level of self-confidence when transitioning into clinical practice, and advice for future SLP graduate students and faculty. Twenty two SLPs responded to an electronically distributed survey generated through Qualtrics. Participants varied in age (28-56 years), geographical location (7 states, 15+ graduate programs), and worked in a variety of settings (59% school, 27% inpatient/hospital, 23% outpatient). Results were obtained, and a thematic analysis was completed to identify common themes, frequent responses, and overarching similarities. The findings from this study are discussed in full.

35. Exploring Issues of Assessment and Selection of a Device in Individuals who Use AAC

Stashia Casimir
Faculty Advisor: Lisa Proctor

Individuals using high-tech AAC to communicate have many software options to choose from when selecting a language system. This study's aim was to determine if caregiver (i.e. typical-functioning adults) perspectives of different language organization software systems improved over time with continued practice. Participants were found via convenience sampling and spent a total of 3 hours over a 3-week period gaining exposure to two high-tech AAC core-vocabulary language software programs: LAMP Words for Life and TouchChat with Word Power. Data was collected on the perceptions of both programs at the conclusion of each session to track changes over time. Results will be analyzed and reported at presentation of study.

36. The Relations Between Parent-Child Literacy Skills

Sara Cooper, Mary Newton
Faculty Advisor: Dr. Shurita Thomas-Tate

The purpose of this study was to describe the relations between parent and child current reading scores, as well as collect qualitative information regarding participant demographics, exposure to literature, and motivation for families participating in a community-based program aimed at increasing family literacy engagement. Mothers and children were administered a standardized reading measure to determine relations between parent-child basic reading skills and reading comprehension. Additionally, a parent survey and a child survey were administered to further explore literacy practices. Participants included four mothers and five children (ages 6-12). Results indicated that there were relations between parent and child literacy scores in the areas of word identification and reading comprehension. All mothers reported positive reading experiences regardless of child performance on standardized measures. Findings support that family literacy is an important factor in child literacy outcomes and experiences.

37. Ujima Language and Literacy Program: A Survey of Volunteer Experiences

Jo-Lynne Fairchild
Faculty Advisor: Shurita Thomas-Tate

The purpose of this study was to gather reflections from individuals who have volunteered with Ujima Language and Literacy. The reflections included qualitative information on cultural competence, child development, child language and literacy, inclusion of genders cultures and religions, and overall experiences. Volunteers were administered an anonymous survey to gather their reflections. Participants included 15 individuals who were Missouri State University undergraduate and graduate students. Results indicated that volunteers generally left Ujima with increased cultural competence, increased knowledge of child language and literacy development, and would also recommend volunteering. Findings support an overall positive volunteering experience with Ujima and demonstrate such opportunities support the University Public Affairs mission.

38. Benefits of Participation in Ujima Literacy Camp as a Non-Traditional Clinic Experience for SLP Graduate Students

Somer Bransfield, Kaitlin Cablish
Faculty Advisor: Shurita Thomas-Tate

Speech Language Pathology (SLP) students participate in several clinical experiences throughout graduate school. Typical graduate experiences are found within university clinics, schools, and in medical practices. Non-traditional clinical experiences can provide valuable information for a career as an SLP including additional exposure to teaching literacy. The purpose of this study was to gather reflective information about participation in Ujima Literacy Camp as a clinical experience. A 10 question Google Survey was sent to 14 current and previous Missouri State University graduate students who participated in Ujima as a clinical experience. Ten out of 14 surveys were received and analyzed. Survey responses indicated that graduate students felt they gained skills in working with students with varying skills, working with students in groups, working with diverse populations, managing client behaviors, and targeting multiple goals. Respondents reported Ujima was a unique experience as compared to the traditional one-on-one clinical model. Survey responses indicated graduate students felt Ujima increased their knowledge in teaching literacy concepts and further prepared them for providing services in schools.

KINESIOLOGY

39. Impact of Vigorous Intensity Exercise Session on Misinterpretation of Intensity Range and Future Engagement

Ashley Carr, Andrew Mudd, Cody Mullins, Evgeniya Price, Hayleigh Grosze, Sara Powell, Jacob Gdovin, Riley Galloway
Faculty Advisor: Riley Galloway

PURPOSE: This study aimed to determine the influence of a guided vigorous intensity exercise session on future voluntary exercise of at least moderate to vigorous physical activity (MVPA). Information was used to determine if individuals misinterpret intensity ranges based on affective responses. METHODS: Participants (N=42 age=22.5±3.1 years) wore an accelerometer for 7 days to determine voluntary exercise intensity. An aerobic exercise session (70%-85% of HRR) was then administered. Accelerometers were then worn for another 7 days. Participants reported exercise information and affective valence ratings to all exercise sessions. RESULTS: The initial seven days, time was spent: 62.0% sedentary, 19% light intensity, and 3.9% MVPA. Post-intervention showed a significant decrease light intensity (12%, $p<0.05$) along with an increase in MVPA (5.2%). Participants rated the vigorous intensity session as more positive affective valence (PAV) as compared to their voluntary daily exercise. CONCLUSION: Results suggest a structured vigorous exercise session may positively influence engagement in exercise at higher intensities. This may be due to a better understanding of what constitutes vigorous intensity and the ability to maintain PAV.

40. Relationship Between VO2max and Average Weekly Exercise Engagement

Jered Weger, McKenna Stuart, Darrius Montgomery, Nicholas Padgett, Breanna Rodgers, Sara Powell, Jacob Gdovin, Riley Galloway
Faculty Advisor: Riley Galloway

Purpose: Maximal oxygen consumption (VO2 max) is considered an indicator of cardiorespiratory fitness (CRF) (ACSM, 2014). Due to the relationship between CRF and exercise volume, an individual with a higher VO2 max should engage in a higher volume of weekly aerobic exercise. The purpose of this study was to determine the relationship between VO2max and average aerobic exercise volume (time and duration) assessed via accelerometry. Methods: Participants performed a VO2max test using the Bruce Protocol. Participants then wore an accelerometer to quantify exercise duration and intensity during the times logged as voluntary exercise. Results: Participants (N=31, age=22.3±2.1 years) averaged VO2max of 44.7±7.4 ml/kg/min. Participants logged an average of 2.9±1.4 days of aerobic exercise which consisted of 38.7±19.1 minutes of moderate-to-vigorous intensity per day. Results showed a significant relationship between VO2max and average volume of aerobic exercise during a one-week period ($r=0.52;p=0.011$). Conclusion: Due to the significant correlation between VO2max and aerobic exercise volume, these results support the notion that increasing VO2max allows for sustained exercise at higher intensities which provides greater health benefits.

41. The Effect of Exercise Induced Muscular Fatigue on Postural Sway

Taylor Beadle, Bethany Brauer, Asher Dicello, Hunter Haynes, Aireyan Johnson, Sara Powell, Riley Galloway, Jacob Gdovin
Faculty Advisor: Jacob Gdovin

Purpose: High-intensity exercise results in muscular fatigue. While balance is important in preventing falls, its associated sway measures have not been investigated following a fatiguing bout of exercise. Therefore, the purpose of this study was to determine the effects of exercise-induced muscular fatigue on postural stability and balance. Methods: Twelve recreationally trained individuals completed a repeated sit-to-stand activity. This test required participants to go from a seated to a standing position, as many times and as fast as possible, in oneminute. A metronome was then set to a pace equivalent to the number of repetitions completed in the first minute. The test was terminated when they could not complete 50% of the first-minute repetitions or volitional fatigue. Participants underwent pre- and post-fatigue balance assessments using various stances while alternating between eyes open and closed. Sway velocity and sway root mean square (RMS) values were recorded for the duration of the balance assessments in two directions. Results: There was no significant ($p > 0.05$) time x condition interactions for velocity nor RMS. Conclusion: Postural sway measures were not impacted following a muscle fatiguing protocol.

42. Fitness Level and its Effects on Postural Sway Parameters Following Exercise Induced Muscular Fatigue

Katelynn Bratcher, Gabriel Greer, Cara Hawks, Juliana Helleny, Madison Orr, Sara Powell, Riley Galloway, Jacob Gdovin
Faculty Advisor: Jacob Gdovin

Introduction: Muscular endurance and balance are needed to complete activities of daily living; however, it is unclear if fitness level impacts balance after a muscular fatiguing exercise. Therefore, the purpose of this study was to determine if fitness level is directly correlated with balance parameters. Methods: Twelve recreationally trained individuals completed a fatiguing protocol consisting of a repeated sit-to-stand activity. This test required participants to go from a seated to a standing position, as many times and as fast as possible, in one-minute. A metronome was then set to a pace equivalent to the number of repetitions completed in the first minute. Participants were asked to maintain this pace until they could not complete 50% of the first-minute repetitions or until volitional fatigue. Participants underwent pre- and post-fatigue balance assessments using various stances while alternating between EO and EC. Results: There were no

significant correlations between the total sit-to stand repetitions and AP/ML RMS. However, there is a strong negative correlation between total repetitions and AP/ML velocity. Conclusion: Increased fitness level cause an individual to sway faster in the different directions.

43. Determining the Impact of Affective Valence on Regular Voluntary Exercise Habits

Zachary Chapis, Emma Skornia, Tarah Phongsavath, Jordan Eickelman, Tahlia Delgado, Sara M. Powell, Jacob R. Gdovin, Riley Galloway
Faculty Advisor: Sara Powell

Psychological aspects of physical activity are important for behavior change, yet research lacks assessment of momentary affective response to predict of future exercise engagement. This study examined the relationship between momentary affective responses and physical activity participation. Forty-two participants (22.6±3.4 years) wore an accelerometer for two seven-day periods to measure physical activity. Participants used a smartphone app (PACO) to rate mood, discomfort, exercise enjoyment, and self-efficacy during or immediately following exercise. In week one, participants averaged 59.4 (SD = 19.9) minutes of daily moderate to vigorous physical activity (MVPA), and 775.3 (SD = 292.5) minutes of light physical activity. In week two, participants engaging in 48.7 (SD= 20.8) minutes of MVPA, and 694.8 (SD = 242.7) minutes of light physical activity. Participants rated exercise enjoyment (5.8±1.2), mood (4.9±1.0), and self-efficacy (4.4±0.6) highly while indicating low levels of discomfort (4.9±1.0). These findings have important implications for using momentary affective responses to explore current and future exercise engagement. This information will be used to inform future interventions to increase physical activity.

44. Affective Influence on Fitness Level and Time to Fatigue

Aaron Crouch, Brittney Gerling, Carly Backues, Sydnee Daugherty, Taylor Fax, Sara M. Powell, Jacob R. Gdovin, Riley Galloway
Faculty Advisor: Sara Powell

This study examined the relationship of exercise motivation and self-efficacy to fitness level and time to fatigue. Twelve participants (22±1.9 years) reported level of exercise motivation, self-efficacy for exercise, and leisure physical activity. Participants then completed an exercise including sit-to-stand repetitions to the point of muscular fatigue followed by balance testing using the Balance Error Scoring System protocol. Participants reported high levels of intrinsic motivation (M = 4.6±0.7), relative autonomy (M = 15.9±4.2), and exercise self-efficacy (M = 61.7±21.9). Participants self-reported as active with an average of 60.2±18.4 METS of weekly activity. Average recorded heart rate following exercise was 174.9±13.6 beat per minute and time to fatigue was 504.1±240.4 seconds. Significant bivariate correlations were found between intrinsic motivation and relative autonomy ($r = .77$, $p = .003$) and self-efficacy and self-reported physical activity ($r = .67$, $p = .018$). Active college aged students exhibited high levels of exercise self-efficacy, intrinsic motivation, and relative autonomy. The relationship between these psychological variables, fitness level, and time to fatigue remains unknown.

OCCUPATIONAL THERAPY

45. Effects of Mindfulness-Based Stress Reduction on the Belongingness Component of Social Participation in Older Adults

Janie Flint, Allison Kozinski, Shelby Rothmier, Cynthia Sanchez
Faculty Advisor: Tara Boehne

This study examined the effects of a mindfulness-based stress reduction (MBSR) program on sense of belonging and its effectiveness as an intervention to improve social participation among older adults. Four participants completed an 8-week program and were assessed using the Community Integration Measure (CIM) and the Cognitive and Affective Mindfulness Scale-Revised (CAMS-R) as pre-post measures. A dependent t-test comparing total pre-posttest scores for the CIM revealed an insignificant

difference, p = .252, and a moderate effect size, d = -0.71, indicating that MBSR may impact sense of belonging. Additional research is necessary to determine MBSR's effectiveness as an intervention.

46. Examining the Relationship Between Playfulness and Trauma in Children Residing in a Crisis Nursery

Madeline Hall, Collin Hill, Rene McKiddie, Chandra Smith
Faculty Advisor: Ashlea Cardin

Play is considered the primary occupation of children and is foundational to child development. Previous studies have demonstrated that psychological trauma may negatively affect children's participation in play. Researchers observed and compared play behaviors and indicators of trauma in children staying at a crisis nursery in the Midwest United States. Student researchers assessed 25 children for playfulness and trauma using the Test of Playfulness (ToP) and a modified version of the Developmental Trauma Disorder Structured Interview for Child (DTDSI-C), respectively. The results of this study demonstrated a possible negative correlation between playfulness and trauma. Limitations of this study included the self-report nature of the DTDSI-C and the limited number of participants that qualified to participate in both assessments. These results may guide occupational therapists' evaluation and treatment of children who experience play deficits, traumatic symptoms, or both.

47. Sensory-based occupational therapy intervention on sucking organization in hospitalized term infants with neonatal abstinence syndrome

Erika Buckner, Bree Cornett, Sierra Jay, Ashley Percival, Rachel Prather
Faculty Advisor: Ashlea Cardin

There is a need for evidence informing occupational therapy standard of care for the growing population of hospitalized full-term infants with neonatal abstinence syndrome (NAS). The aim of this pilot study was to determine if vestibular sensory-based, gentle-movement therapy (GMT) interventions delivered prior to feeding would impact bottle-feeding organization in term infants experiencing NAS. Each infant alternated between three counterbalanced levels of intervention-two sensory-based, one control-delivered immediately prior to six separate feedings within a 48-hour window. Sucking organization metrics were measured before and during feeding using the nfant® biofeedback device. Visual analysis of the single-subject and multi-subject data displayed a trend toward the normative data and decrease in variability during control and intervention phases, indicating that infant sucking behaviors may be impacted by GMT interventions, but more evidence is needed. GMT shows potential for impacting bottle-feeding organization which may provide occupational therapy practitioners with new knowledge informing care of term infants with NAS.

48. Effect of Wii-Based Movement Therapy and Modified Constraint-Induced Movement Therapy in Children with Neuromotor Unilateral Weakness

Demi Armstrong, Mary Holley, Kenna Sheppard, Gretchen Rauch, Sapna Chakraborty, Ashlea Cardin
Faculty Advisor: Sapna Chakraborty

Wii-based movement therapy (WMT) and modified constraint-induced movement therapy (mCIMT) are intervention strategies used to treat individuals with neuromotor unilateral upper extremity (UE) weakness. PURPOSE: To investigate if using WMT during mCIMT affects occupational performance as measured by the Assisting Hand Assessment (AHA) and occupational engagement as measured by the Parent Report Questionnaire (PRQ) within this population. METHODS: Researchers used a pre-post + 2-month follow-up experimental design to assess changes in the AHA. The PRQ was administered post intervention. One child (8 years) participated in fifteen 2-hour mCIMT sessions over six weeks. DATA ANALYSIS: Kendall's tau measured change on the AHA and PRQ. RESULTS: AHA: pretest-posttest ($\tau b = 0.29$, $p = 0.192$); pretest-follow-up ($\tau b = 0.25$, $p = 0.242$); posttest-

follow-up ($\tau b = 0.50$, $p = 0.019$). PRQ: pretest-posttest ($\tau b = 0.83$, $p < .001$). CONCLUSION: The parent reported a significant change in PRQ scores post intervention, which was not reflected in AHA scores. Interestingly, AHA scores did improve significantly between post intervention and follow-up. Due to the small sample size, additional research is needed to generalize to larger populations.

49. Occupational Therapy Study: Grip Strength in Aging Adults

Morgan Thompson Paige Prost, Erica Schuette, Brittany Rempel
Faculty Advisor: Marc Willey

Grip strength is utilized for a baseline evaluation for healthcare professionals and workers' compensation claims. The purpose of this study is to determine the relationship between grip strength, age, sex, BMI, forearm circumference, and hand length in adults between 45-74 years old. Researchers recruited 85 participants using convenience sampling throughout the Midwest. Several participants (n=34) were excluded due to preexisting upper extremity medical conditions that limit grip strength. Utilizing JASP 2.0, Pearson's r tests were performed to assess the correlational relationship between variables when analyzing the data collected. The results determined positive correlations between dominant hand length($r=0.828$), BMI($r=0.384$), and forearm circumference($r=0.809$) in relation to dominant grip strength while negative correlations were found with age($r=-0.364$) and sex($r=-0.854$) in relation to dominant grip strength. There were similar findings with non-dominant grip strength. In conclusion, the results indicated a potential expansion on current determinants of normative data used in determining grip strength. Future recommendations include obtaining a larger sample size and utilizing different forms of participant recruitment.

PHYSICAL THERAPY

50. Effectiveness of Virtual Reality Physical Therapy Treatment on Self Perceived Urinary Incontinence in Older Adults: A Case Series Study

Samantha Bennett, Courtney Johnson, Christopher Morse, Katherine Neds, Gretchen Stein, Patricia Cahoj, Sean Newton, Jeanne Cook, Jason Shaw
Faculty Advisor: Patricia Cahoj

Introduction. Urinary incontinence (UI) can lead to issues such as loss of independence and decreased quality of life. Our study investigates using virtual reality as a quick, easy, functional, cost-effective way of providing adequate therapeutic sessions.
Methods. This case series involved four subjects with a history of urinary incontinence who participated in 30 minute treatment sessions of seated pelvic tilting exercises using a Nintendo WiiFit to control the results of a virtual reality game depicted on a monitor. Minimal Important Difference (MID) for each survey was established to determine change in our case series.
Results. Participant D made improvement with subjective UI symptoms from 12 points to 7 points on the ICIQ-UI-SF. Participants B, C, and D made improvement in self-perceived incontinence from an average of 33 points to 19 points on the ICIQ-OAB. All participants made improvements in certain domains through data collected by the King's Health Questionnaire.
Conclusion. Participants who complied with Wii Fit balance board activities experienced varying decreases in urinary incontinence and an improved ability to complete functional activities without leakage.

51. Relationship Between Clinical Performance Instrument and MSU DPT Program Applicant Interview Scores

Victoria White, Blair Twaddle
Faculty Advisor: Jeanne Cook

Predicting the clinical success of Doctor of Physical Therapy (DPT) students can be challenging for physical therapy educators. By comparing the

applicant's score on the multiple mini interview (MMI) to the student's clinical performance rating on the Clinical Performance Instrument (CPI), admissions faculty can determine if a relationship exists between program interview criteria on the MMI and student performance on the CPI. Participants in the study were students in the Missouri State University DPT program (N=38, male=20, female=18). Research was done with the use of the MMI, short, structured interviews and the CPI. Some relationships exist between MMI scores and specific criteria of the CPI. Moral courage and education interventions had a positive correlation. Commitment to learning was negatively correlated with accountability and cultural competence. Results could help shape future interview processes at MSU and provide a framework for other academic institutions to evaluate admissions processes, but further study is needed. Limits of this study include a small n, small predictive relationships, clinical education represented by 6 out of 32 total weeks, and one cohort being used.

52. Comparison of Clinical Performance Instrument Scores with HEXACO Personality Inventory

Alec Schroff, Eric Esposito, Jeanne Cook
Faculty Advisor: Jeanne Cook

Introduction: The Clinical Performance Instrument (CPI) is a clinical performance standardized assessment tool. The HEXACO Personality Inventory (HEXACO-PI) measures noncognitive variables via a self-survey. Purpose: To determine if relationships exist between student CPI scores and HEXACO-PI measures. Hypothesis: Relationships exist between CPI scores and applicant scores on the HEXACO-PI. Methods/Results: Applicants completed the HEXACO-PI and upon matriculation, were assessed with the CPI during a first clinical internship. Participants include N=38 (male=20, female=18), two students were excluded from the study due to incomplete data. Pearson Correlation resulted in weak significant relationships. A multiple linear regression produced the following significant results: Emotionality Sentimentality with Documentation and Cultural Competence (+) with R squared of 0.147; and Openness to Experience Appreciation with Reasoning and Documentation (-) with R squared of 0.133. Conclusion: Although statistical significance was achieved in two areas, further research is required to strengthen evidence of correlation and predicted variance of these tools.

53. Does the Modified Thomas Test Position Allow More Passive Hip Extension than Prone Lying in Patients with Transtibial Amputation?

David Smith, Danielle Boyle, Lauren Kelley, Jade McFarland, Vincent Parisi, David Smith, Nathan Turner, Clinton Wallis, James Hackney, Jason Shaw
Faculty Advisor: James Hackney

Individuals with a transtibial amputation are at high risk of developing hip flexion contracture which can hinder ambulation with a prosthesis. Commonly, patients are advised to lie prone to prevent hip flexion contractures. However, prone lying (PL) may cause compensatory anterior pelvic tilt, decreasing the potential hip extension stretch. We propose that Modified Thomas Test (MTT) position is more effective. In MTT, the patient lies supine with the leg to be stretched over the edge of a bed or treatment table, while the opposite leg is held to their abdomen. This allows the patient to better control the angle of the pelvis, and thereby more effectively stretch the hip flexors.
Eight men and two women, ages 49 to 73 with dysvascular transtibial amputation (TTA) participated. In order to avoid rater bias in hip angle measurement, six raters measured each patient's hip extension in PL and six different raters measured in MTT.
The intraclass correlation (ICC) showed high interrater reliability between the raters for both positions. We found that patients had $5.4° \pm 6.6°$ more hip extension with MTT compared to PL. Our findings suggest that PL is not as effective as MTT for preventing hip flexion contractures in patients after TTA.

54. Do Balance Assessment Scores Predict Increased Fall Risk for Patients Enrolled in Cardiac Rehabilitation?

Breanna L. Alder, Dannyca A. Hildebrand
Faculty Advisor: Marcia Himes

Introduction: Cardiac rehabilitation (CR) is a supervised medical program designed to improve cardiovascular health following a cardiac event. Individuals enrolled in CR often have multiple comorbidities and decreased functional mobility that increases fall risk. The purpose of this study was to determine which tests predict fall risk in the CR population; allowing provision of optimal care and improvement in quality of life. Methods: Ten individuals (mean age = 68.5 ± 15.72, Male = 6, Female = 4) recruited from CoxHealth CR Department completed the Activities-Specific Balance Confidence Scale (ABC), Functional Gait Assessment (FGA), 30-second Chair Stand Test (CST), and the Functional Reach Test (FRT). Results: A significant positive correlation was found between the CST and the FGA ($r = .74$, $P = .01$). Regression analysis revealed the CST was a significant predictor of dynamic balance, as measured by the FGA ($F(3,10) = 4.586$, $P > .05$, $R2 = 0.70$). Conclusion: Further studies are needed to investigate the predictive ability of specific tests for assessing fall risks for patients enrolled in cardiac and pulmonary rehabilitation and validate these findings within a larger sample size.

55. What Objective Tests and Measures Determine Fall Risk in the Cardiac Rehabilitation Population?

Erin Keethler, Kellie Stringer
Faculty Advisor: Marcia Himes

Introduction: Cardiac rehabilitation (CR) is a comprehensive, medically supervised program allowing individuals with multiple cardiovascular disorders to be monitored and exercise in a safe environment. CR participants may have multiple comorbidities and risk factors that can lead to increased fall risk. Therefore, there is a need to determine which objective tests could be used to assess fall risk in CR participants to facilitate health preservation and independence. The purpose of this study was to determine if the Functional Gait Assessment (FGA), Timed Up-and-Go Test (TUG), the 5 Times Sit-to-Stand Test (FSTS), or the Four Step Square Test (FSST) could predict fall risk for individuals enrolled in a CR program. Methods: Ten individuals (mean age = 68.5 ± 15.72, Male = 6, Female = 4) participated in Fall Prevention Awareness Day at CoxHealth Hospital. Results: There was a statistically significant correlation between the FGA and FSST ($r = -.77$, $P = .01$), TUG and FSTS ($r = .96$, $P > .01$), TUG and FSST ($r = .71$, $P = .02$), and the FSST and FSTS ($r = .75$, $P = .01$). The TUG, FSST, and FSTS had no significant predictive ability related to FGA scores, which may be due to small sample size. Conclusion: Further studies are needed to investigate outcome measures that can identify fall risk in the CR population.

56. Eccentric Exercises for Treatment Subacromial Impingement: A Systematic Review

Abigail Ullo. Taylor Ewy
Faculty Advisor: Sean C. Newton

Introduction: Subacromial impingement has increasingly become the most common shoulder pathology diagnosed. Conservative treatment traditionally focused on concentric exercises. Recent studies indicate that eccentric exercises may be just as effective in improving patients' outcomes. Our aim was to perform a systematic review comparing eccentric focused exercise training to other physical therapy (PT) treatments.
Study Design: Systematic Review
Methods: Electronic databases were used (PubMed, EBSCOhost, and PeDro) to find articles related to the research topic. Inclusion and exclusion criteria narrowed the search. 6 articles were analyzed using the Delphi scoring system.
Results: Eccentric exercise training showed to be an effective regimen to treat subacromial impingement syndrome by improving patient outcomes. However, most articles showed no significant difference in outcomes between concentric and eccentric exercises.
Conclusion: Eccentric training showed positive outcomes as a conservative treatment option for

rotator cuff pathologies. However, concentric training showed similar positive outcomes in this systematic review. Therefore, both training programs may be utilized as beneficial treatments.

57. Martens vs Figure-Four ALRI Test: A Comparison of the Ability to Detect Anterolateral Rotational Knee Instability

Adam Schwent, Cory Stattelman
Faculty Advisor: Sean C. Newton

A cadaveric study was performed comparing the amount of anterolateral rotational instability (ALRI) detected using the Martens test versus a modified version (Figure-Four ALRI test) developed by the investigators. 5 cadaveric subjects (10 knees) were used by the investigators where both tests were used to analyze ALRI in 3 conditions with progressively less ligamentous support. A 3x2 repeated measures ANOVA was performed to detect differences in anterolateral instability. There were differences found between conditions, as expected. No differences were found between the interaction of condition and test. At least 94% of the time that the Martens test detected anterolateral rotatory instability, the Figure-four test detected it as well. Lastly, differences found in the amount of anterolateral instability detected between tests; furthermore, when comparing the amount of translation detected, the Figure-four test was able to detect significantly more instability. These findings may indicate that the Figure-four ALRI test is more sensitive when attempting to diagnose anterolateral rotatory instability in the knee, although further research will need to be done to further evaluate the validity of the Figure-four ALRI test.

58. Is there a difference in ease of use between the NeuroCom InVision System and the Bertec Vision Advantage?

Kirsten McFarland, Cody Spencer, Megan Barnes, Alyssa Heinsohn, Kaytlyn Wells
Faculty Advisor: Barbara Susan Robinson

Vestibular-Ocular Reflex (VOR) integrity is assessed with the Dynamic Visual Acuity Test (DVAT) and Gaze Stabilization Test (GST). The NeuroCom InVision System (NIS) has good reliability and validity for assessing the VOR. However, ease of use and testing time have not been examined. This study was conducted to compare the ease of use between the NIS and the Bertec Vision Advantage (BVA) when testing VOR integrity in healthy college students. We hypothesized participants would report greater ease of use with the BVA and that the NIS would require less testing time. Twenty-five individuals (mean age = 23.4 ± 1.73, Male = 7, Female = 18) participated. They were included if they had corrected vision of 20/20 or better and between the ages of 18-30 years; excluded if they had impaired vision or balance, or previous participation in vision training or other visually demanding tasks. All participants completed one trial with each device. Standardized instructions were given. Testing order was randomized and a 2-minute rest break was provided between trials. The BVA took significantly longer to complete and resulted in increased dizziness; however, the majority of participants found it easier to use and more comfortable than the NIS.

59. Changes in Hip Range of Motion and Pain with Posterior Relocation Testing and Correlation with Hip Micro Instability

Jantsen Lynn, Chace Smartt, Courtney VanDreese, Emily Goeken, James Basham
Faculty Advisor: Scott Wallentine

This study is continuing and advancing previous research based on a change in hip pain levels, passive hip flexion, and internal rotation measurements. These changes were observed in symptomatic individuals without and with a manually applied approximation force from posterior to anterior through the greater trochanter, called the posterior relocation test (PRT) of the hip. The goal of this study was to further establish reliability and validity of the PRT by recreating previous results, as well as, correlating results with other special tests found to correlate with hip micro-instability. A cluster of three special tests that were used have been shown to have a 95% likelihood of finding hip micro-instability confirmed

intraoperatively. However, these tests screen specifically for integrity of anterior hip structures versus posterior, which are targeted with the PRT. Taking this into account, we've also chosen to correlate the PRT with the posterior apprehension test, which specifically targets posterior structures.

60. Effects of Time of Day on Postural Stability During a Cognitive Task Among Older Adults

Tiffany Lee, Callie McLaurin, Elizabeth Williamson
Faculty Advisor: Elizabeth Williamson

Purpose/Hypothesis: This study examined the interaction between time of day, cognitive demand on balance among older adults using the VSR Clinical Test of Sensory Interaction and Balance (CTSIB) system.
Subjects: 20 older adults
Methods and Materials: Initial session, participants completed a sensory organization test (SOT) and an auditory Stroop test. Two additional sessions were completed (one in the morning and the other in the evening). Within each session, participants completed a SOT as a single task and a SOT concurrent with an auditory Stroop test. Steadiness of static posture was analyzed using a repeated measure analysis of variance (ANOVA) and a mixed ANOVA.
Results: Significant main effects were noted for single versus dual task conditions and different sensory conditions.
Conclusions: Although most of the significant findings replicate previous studies, the correlation between age, single task, and evening is a finding which requires further research.

61. Childhood Obesity Among Children With and Without Childhood-onset Disabilities in Southwest Missouri

Bailey Williams, Gabrielle Hermes, Elizabeth Williamson
Faculty Advisor: Elizabeth Williamson

Purpose/Hypothesis: Our study compared over weight prevalence in southwestern Missouri for children with and without childhood-onset disabilities.
Subjects: Thirty-nine children and adolescents (24 without and 15 with childhood-disabilities)
Methods and Materials: Physical therapy students measured height, weight and percentage body fat using bioelectrical impedance analysis (BIA). Each participant's body mass index (BMI) was calculated using a CDC BMI Calculator for children. Signed consent and assent forms were acquired prior to data collection. One participant withdrew from the study.
Results: Among participants without childhood-onset disabilities, 42% using BMI and 4% using BIA were considered over-weight or obese. Among participants with childhood-onset disabilities, 47% using BMI and 33% using BIA were considered over-weight or obese.
Conclusions: The rate of over-weight and obese for our sample was higher than the published national average of 32% using either measure. A larger sample size and methodical data collection is necessary to draw any conclusion. If future findings are consistent, effective strategies are needed to reduce childhood obesity in Missouri to lessen the risk of developing cardiovascular disease.

PSYCHOLOGY

62. Social Selves: The Many Faces of One's Personality

Tyler Priest, Amaris Clay, Casandra Stanbrough, Amber Abernathy
Faculty Advisor: Amber Abernathy

Previous research suggests self-assessments of personality aren't completely different from the perceptions of others, and that self-other agreement increases, but does not become identical, as the level of acquaintanceship between individuals increases (Vazire & Carlson, 2010). However, other research suggests there is an asymmetry in the accuracy of personality judgments based on role-specific and self-conceptions (Roberts & Donahue, 1994). Social context may play an important role in our behaviors, therefore having an impact on how we are viewed in social settings. The current study compared 77 individuals' assessment of their own "Big Five" personality traits to assessments made by others

(including family, friends, and strangers) in order to determine if personality is assessed differently based on role context. Results revealed that stranger scores were the most similar to self-report score on all of the Big Five traits. Additionally, it appears family members' scores were significantly different from self-report scores on four of the five personality traits. Similarly, friend scores were significantly different from self-report scores on extraversion and agreeableness. Overall it appears that context impacts personality reporting. These findings might help explain how personality is dynamic and should be evaluated in different roles and contexts.

63. Overcoming the Odds: The Moderating Effects of Trait Conscientiousness and Empathy on the Relationship Between Adversity and Resiliency

Victoria West Staples, Lydia Needy, Amber Abernathy, CaSandra Stanbrough
Faculty Advisor: Amber Abernathy

This research seeks to understand the connection between adverse backgrounds and the development of resiliency while examining the effects of that relationship on the development of trait conscientiousness and empathy. Specifically, this study was created to answer two main questions: (1) Do adverse experiences in childhood impact the development of resiliency? (2) Is trait level conscientiousness and/or empathy affected by the relationship between adverse backgrounds and resiliency? Results revealed levels of adversity were positively correlated with resiliency scores, suggesting they are related. The adversity/resiliency relationship had a positive impact on empathy scores from the Emotion Quotient questionnaire (EQ), but empathy scores from skin conductance were insignificant. Resiliency had the opposite effect on conscientiousness than previously predicted because resiliency scores had a negative impact on conscientiousness ratings.

64. Learning to Relax: The Impact of Biofeedback and Yoga on Salivary Cortisol Reduction

Weston Phipps, Rebekkah Wall, Amber Abernathy, CaSandra Stanbrough
Faculty Advisor: Amber Abernathy

The human stress response is a natural response to threats. While short-term stress activation can be helpful, long-term stress activation has been correlated with negative effects on health and longevity. The current research aims to test whether this long-term stress activation can be decreased with the usage of short-term intervention techniques. In this study, it was hypothesized that individuals receiving interventions would have a greater stress reduction. The intervention techniques examined in these studies include biofeedback training and Hatha yoga. In both studies, four saliva samples were collected from participants for the purpose of measuring cortisol, which is a primary stress hormone. These cortisol measurements were used to establish a baseline for the participants, and then compare the differences of returning to baseline after becoming stressed. The rate at which control group participants returned to baseline was compared to those who received interventions. Upon examination of the data it was found that the hypothesis of both studies were supported, and that short-term interventions aided in reducing stress levels faster than returning to baseline normally.

65. Super Hero or Evil Villain: The Role of Parental Supportiveness in Child's Subsequent Personality

Chynna Frizell, Rebekkah Wall, Amber Abernathy, CaSandra Stanbrough
Faculty Advisor: Amber Abernathy

Active parental engagement is a significant predictor in the outcome of the child's life (Belsky, Steinberg, & Draper, 1991). Due to the variable nature of fathers' investment, expectations about the future could be best predicted by the relationship with the father (Byrd-Craven, Geary, Vigil, & Hoard, 2007), although research is not as abundant in this area. The current study examined 107 participants and the

relationship between warm fathers that are perceived as having warmth, structure, and autonomy and negative fathers perceived as rejecting, chaotic, and coercive in the child's personality development. The results revealed a positive relationship between the perceived level of a father's warmth and the child's subsequent levels of conscientiousness. Perceived negative father parenting styles predicted a Machiavellian world view in children. Negative fathers could be increasing exposure to a harsh environment and transferring their views about the world. Similarly having a warm father could be signaling a more positive overall view of the world. Taken together, fathers' representation of the social climate may impact the child's personality development.

66. Effects of Implicit Bias and Emotion on Explicit Bias: Heterosexuals' Attitudes Toward LGBT People

Laura Cox
Faculty Advisor: Melissa Fallone

We hypothesized that if a person has a higher implicit bias against the LGBT community, then their explicit bias will be more influenced by emotion than those with a lower implicit bias. To test the hypothesis, 80 introductory psychology students (39 women and 41 men) ranging in age from 18 to 24 were randomly assigned to complete a 5-minute writing task designed to elicit anger, fear, or relaxation. Explicit bias was then measured using a scale assessing attitudes towards LGBT people, followed by an Implicit Association Test (IAT). The results did not support the hypothesis: Participants did not show significantly different levels of explicit bias depending on their emotion condition, $F(2, 52) = 0.505$, $p = .606$. Perhaps future research could expand the sample to include a wider range of ages and educational backgrounds in order to make participant demographics more representative of the voting population.

67. Identification of Grooming Tactics Based on Educational Background

Johnathan Sparks
Faculty Advisor: Melissa Fallone

Is an individual's capability to identify grooming tactics when they are used by child sex offenders dependent on their educational background? To answer this question, 319 participants (282 introductory psychology students and 37 graduate students and professionals) were each given one of six different vignettes to read; each vignette described a hypothetical relationship between a baseball coach and one of his players. Each randomly assigned vignette included either one of the four main grooming tactics, all of the tactics, or none of the tactics. These vignettes were used previously in other studies and found by experts to be real and accurate (Winters & Jeglic, 2016; 2017). Participants rated the likelihood of twenty present and future statements regarding the coach. Data was analyzed using a chi-square analysis to determine the relationship between the level of education a participant has and how accurately they were able to identify when grooming was taking place. As hypothesized, graduate students and professionals were better able to accurately identify grooming tactics than were undergraduate students.

68. The Impact of Selection Method on Leadership Ratings and Beliefs

Hannah Johnson
Faculty Advisor: Melissa Fallone

The impact of leader selection method on leadership ratings and beliefs was tested by separating 96 participants (47 female, 47 male, and 1 undisclosed) into small groups. Each group had a leader (confederate) who was purportedly selected 1 of 3 ways (personality questionnaire, experience questionnaire, or randomly) that led the group through a survival simulation task. The participants then rated the leader's effectiveness, how much the leader's personality and experience impacted the leader's success, and the degree to which leaders are born or made. The results did not support that selection method impacted leader's effectiveness

ratings ($F(2,88) = 1.921$, $p = .153$), rating of how much personality and experience impacted the leader's success ($F(2, 88) = 0.886$, $p = .416$), or whether participants believed leaders are born or made ($F(2,92) = 1.406$, $p = .250$). Selection method may not have significantly affected participant responses, but it may be more impactful when there are higher stakes for the participants.

69. Development and Validation of Implicit Measures of Organizational Climate

Kailey Meyer
Faculty Advisor: Donald Fischer

Over the last few decades organizational climate has become an increasingly popular topic within Industrial-Organizational Psychology. Organizational climate is defined as the shared perceptions that employees hold about their experiences in the workplace. Research on organizational climate typically uses explicit (self-report) measures, which can be susceptible to impression management artifacts. This research used Implicit Association Test (IAT) procedures to develop implicit measures of selected aspects of organizational climate. The relationship of the implicit measures of organizational climate with theoretically related explicit (self-report) measures was examined using a multitrait-multimethod design. A series of confirmatory factor analyses of latent trait models provided some evidence of convergent and discriminant validity. In conclusion, while some evidence supports the validity of the implicit measures, future research might focus upon developing measures with better psychometric properties.

70. The Development and Validation of the Implicit Job Satisfaction Measure

Xin Wei Ong
Faculty Advisor: Donald Fischer

For many decades job satisfaction has been one of the most popular research topics in industrial-organizational psychology. Job satisfaction is the extent to which an individual's affective response to the overall evaluation of his/her job is favorable or unfavorable. Researchers have examined different aspects of job satisfaction and have developed various scales to assess these dimensions, primarily through the use of explicit (self-report) measures. However, problems with explicit measures can limit the accuracy of the attitude presented by the respondent. Implicit measures represent an alternative way to assess attitudes. Implicit measures can mitigate the contaminating effects of impression management and inaccurate self-knowledge. This research used Implicit Association Test procedures to develop implicit measures for three dimensions of job satisfaction - the work itself, supervisor relations, and coworker relations. The construct validity of the implicit measures of job satisfaction was analyzed using a multitrait-multimethod design that included explicit measures. Confirmatory factor analyses of alternative latent trait models provided evidence supporting the convergent and discriminant validity of the implicit measures.

71. Evidence for a Non-Linear Relationship Between Infant Visual Behavior and Subsequent Visual Discrimination Learning

Cassandra Kemmel, Abigail Herrmann, Olivia Herring, Molly Smith, Autumn Houser, David Muresan, Makenna Ricketts, Olivia Parks, D. Wayne Mitchell
Faculty Advisor: Wayne Mitchell

Infants who exhibited efficient stimulus processing tend to display shorter fixation times to novel stimuli. Thirty-three 4-month-old infants completed two assessments; (1) an assessment of the infant's natural visual attending behavior; and (2) an assessment of visual learning on a synchronous reinforcement discrimination task. Each infant was classified as a 'Learner', a 'Slow Learner', or a 'Non-Learner'. Measures of their natural attending behavior were then compared. The Non-Learning Group had significantly longer fixations than the Learning and the Slow Learning Group; again supporting the notion that longer fixating infants are at-risk. The Slow Learning Group had significantly shorter fixation times than the Learning Group. These findings add new information supporting a

non-linear relationship between attention and subsequent visual learning. Extreme short fixation times may be too brief to allow stimulus features to be encoded into memory, hence slower visual learning. In contrast, infants that display long fixation times may lack experience that would foster visual learning. A two-factor (habitual and contingency experience) learning model will be presented to explain individual differences in infant learning.

72. The Relationship Between Anticipatory Heart Rate and Response Latency When Solving Simple Math Problems

Cassandra Kemmel, Abigail Herrmann, Makenna Ricketts, Autumn Houser, Olivia Herring, Molly Smith, Olivia Parks, David Muresan, D. Wayne Mitchell
Faculty Advisor: Wayne Mitchell

The relationship between Anticipatory Heart Rate (AHR) and Response Latency (RL) was examined on a Delay Match-To-Sample (DMTS) task. Previous research has demonstrated that the direction (acceleration or deceleration) and magnitude of HR change represent specific attending behaviors; that is, HR deceleration is associated primarily with stimulus encoding and readiness to respond, whereas HR acceleration corresponds to mental effort. The purpose of this study was: (1) to establish AHR (changes in HR between Sample stimulus offset and Test stimuli onset) as an indicator of changes in allocation of attention while solving Numeric and Word Math via a DMTS task, and (2) to demonstrate that AHR is related working memory (RL). AHR Slope was correlated negatively with RL ($r(9) = -.61$, $p < .05$). It is argued that initially, effortful attention is allocated to encoding and storing of stimulus information (evident by AHR acceleration) followed by a decrease in AHR (indicating that stimulus information has been stored successfully into memory and a readiness to respond). The observed HR data in this study lends support for the authors' AHR model and provides further evidence that HR is a valid indicator of individual processing differences.

73. The Bogus Pipeline Method: Evoking and Assessing Truthfulness in Pride and Prejudice

Tegan Hoff, Megan Stahl, Kaylee Rucker, Amanda Bonnot
Faculty Advisors: Ashley Payne and Adena Young-Jones

Honest responses via self-report is an issue researchers deal with when assessing attitudes toward minority groups. Humans have a natural tendency to display "expected" behavior when it is thought that automatic behavior will result in undesirable consequences. Feelings of shame, embarrassment, or social desirability may motivate participants (consciously or unconsciously) to lie about their true beliefs even in a research setting with anonymous surveys and confidential data. The Bogus Pipeline Method (BPM) is an experimental deception procedure used to convince participants that their truthfulness will be monitored. The present study evaluated participants' responses in two conditions using the BPM; sexual orientation prejudice (SOP) and ethnicity prejudice (EP). Results did not yield a discernable difference between the control group and the experimental group in either condition.

74. An Investigation of Foster Care Transition, Attachment, Psychosocial Well-being, and Academic Behaviors of Children in Foster Care

Kaylee Rucker, Ashley Payne
Faculty Advisor: Ashley Payne

The purpose of this study is to investigate the perceived attachment behaviors, psychosocial well-being, and academic behaviors of siblings placed in both non-relative kinship and relative kinship foster care. The following research questions will be answered: (1) What are the different attachment behaviors expressed for each foster child in each placement? (2) How does their attachment behavior impact their psychosocial well-being? (3) How do attachment behaviors and psychosocial well-being impact academic behaviors and success? Semi-structured interviews were held with a relative kinship foster parent, a non-relative kinship foster parent, and teachers of three siblings in foster care

(N=5). Using thematic analysis to analyze the interviews and journals, the following themes were found: (1) the need for attention and affirmation: agreeableness vs detachment, (2) searching for stability: older sibling as caregiver, and (3) foster parent stability & values and academic performance.

75. The Construction of Black Femininity in College Women at PWIs: The role of Safe Spaces and Hip Hop Culture

Whitney Akalugwu, Jordan Hickman, Alexis Alston, Ashley Payne, Nicole West
Faculty Advisor: Ashley Payne

Hip Hop has shown to be an empowering space where Black women actively re-define their representation (Brown, 2009; 2013). How Black women navigate these identities is heavily influenced by the intersection of Black and Hip Hop culture and the culture of predominantly white institutions (PWIs) and has an impact on belongingness, retention, and achievement on college campuses. The purpose of this study is to explore the influence of Hip Hop culture on the construction of Black womanhood at PWIs, particularly among Black women undergraduates who are members of non-Black Greek letter organizations (non-BGLOs) that center their race and gender. The study will answer the following questions: (1) How does Hip Hop inform the construction of race, gender, and sexuality among Black women at PWIs? (2) How does Hip Hop impact the identities of Black college women participating in non-BGLOs for Black women? (3) How does Hip Hop inform how Black college women navigate campus academic spaces, social media, and non-BGLOs for Black women? Participants include 10 undergraduate students. This study will discuss themes surrounding the nuances of racial and gender identity construction, school belongingness, and psychosocial conflict and resolution.

76. Media Impacts on Biological Control

Megan Overby, CaSandra Stanbrough, Amber Massey-Abernathy
Faculty Advisor: CaSandra Stanbrough

The study seeks to explain the connection between biological control and media usage. Specifically, the study examines aspects of media including video game and social media usages at various levels to determine if there are differences in the ability to control biological responses such as heart rate variability and galvanic skin conductance. Two different biological feedback software packages were used to measure "heart rate smoothness" during a biofeedback video game (ALIVE software) and skin conductance response (Bio-Pac) to video stimuli. Participants were instructed to regulate their breathing and heart rate "smoothness" in order to complete the biofeedback video game. Skin conductance response to video clips, average heart rate smoothness, and the amount of time it took for participants to complete a biological regulation task were recorded and compared between the different levels of media usage. Implications for individuals' biological control on behaviors such as emotions and biological connections with others are discussed.

77. Deconstructing Age-Related Messages in the Billboard Top 100

Lydia Nekula, Sierra B. Schieber, Margaret A. McKeon, Ruth V. Walker
Faculty Advisor: Ruth Walker

The media communicates stereotypes about older adults and its influence shapes how we perceive the aging process and what we think it's like to be an older adult. Previous researchers who have studied how older adults are portrayed in popular culture have focused on film, television, and children's books; with some exceptions, the messages we receive from music about older adults and aging has been largely unstudied. In the current study, we sought to understand what direct and indirect messages were being conveyed about older adults and the aging process in popular music and if there are age differences in popular musicians by genre. A

thematic analysis was performed on the lyrics of the Billboard Top 100: Hot 100 Songs, looking for any direct and indirect messages about age, aging, or older adulthood. The six major themes found were nostalgia for youth, generativity and storytelling, the importance of time, expectations of aging and the future, ruminating on death, and the tie between substance abuse and youth. Results of a One-Way ANOVA analyzing artist age by genre will be presented.

78. The Relationship Between Trait Mindfulness and Stress

Ashley Cancino, Mary Vonarx, Victoria West Staples, Elizabeth Troutwine
Faculty Advisor: Carly Yadon

The purpose of this study was to explore the relationship between trait mindfulness and stress, while distinguishing between current stress levels and stress over time. Participants' (N=149) blood pressure and pulse were taken at the beginning of the study and participants completed questionnaires that measured trait mindfulness, current stress (State-Trait Anxiety Inventory), chronic stress (Perceived Stress Scale) and affect (Positive and Negative Affect Schedule). Trait mindfulness, measured by the Mindfulness Attention Awareness Scale (MAAS), was negatively correlated with state anxiety levels ($r(147) = -.591$, $p < .001$), general perceived stress (over the last month), ($r(147) = -.519$, $p < .001$), and negative affect ($r(147) = -.310$, $p < .001$). The negative correlation suggests that higher levels of mindfulness were related to lower stress and lower negative affect. Interestingly, positive affect was not significantly related to mindfulness, suggesting a potential buffer that may be specific to negative thoughts and feelings. Neither physiological measure related to mindfulness. The results for the other three mindfulness questionnaires were very similar to the results for the MAAS. Implications will be discussed.

79. Environmental Influences on Test Anxiety: The Role of Foliage Plants and Windows

Hannah Pulse, Jordan Hickman, Whitney Akalugwu
Faculty Advisor: Adena Young-Jones

Limited research exists regarding the effects of foliage plants in academic environments. Studies show that plants can reduce anxiety and improve attentiveness settings (Lohr, Pearson-Mims, & Goodwin, 1996; Simson & Straus, 1998). Researchers report green plants have many positive effects on stress-related issues as well as improving mental function (Simson & Straus, 1998). Additionally, natural lighting has been shown to have a positive impact on psychological health and the learning environment (Mirrahimi, Ibrahim, & Surat, 2013). The current study examines the impact of environmental factors within classrooms and how perceived motivation, stress, and anxiety contribute to academic functioning by investigating six different classroom conditions with plants and windows. Results found that the classrooms with natural lighting had a positive effect on anxiety.

PUBLIC HEALTH

80. Parental Monitoring of Academics and Adolescents' Engagement in Substance Use

Debadutta Goswami
Faculty Advisor: Kip R.Thompson

Adolescence is a vulnerable period when people are most sensitive to substance use, with lifelong substance use and abuse often beginning during this stage of life. Eighty-eight percent of adult daily smokers initiated tobacco use prior to the age of 18. By the 12th grade, approximately two-thirds of students have tried alcohol and half of 9th-12th-grade students reported using marijuana. Monitoring adolescent substance use, however, is challenging. Parental monitoring and engagement in their children's school life may be one of the most important protective factors contributing to better multiple outcomes to include student behavior, academic achievement and avoidance of unhealthy behaviors, such as substance use. Homework is one of the most popular and frequently used instructional

tools adopted by schools in the U.S. In this study, the following hypothesis was assessed: Does parental monitoring of academics reduce adolescents' engagement in substance use? The 2018 NSDUH dataset and chi-square test was used. Based on the analysis, adolescents who reported being monitored by their parents were less likely to use substances. Future research should examine causal explanations of race subgroup differences to inform the development of group-specific interventions.

SPORTS MEDICINE AND ATHLETIC TRAINING

81. Comparison Between Porous Tape and Self-Adherent Tape on Ankle Balance and Range of Motion

Jennifer Gonzalez, Boyoung Park, Jangsoo Kim
Faculty Advisor: W. David Carr

Taping techniques are used for preventative purposes in active populations. The effectiveness of self-adherent tape has not been widely researched. The purpose of this study was to examine and compare the effectiveness of porous tape and self-adherent tape on balance and ankle range of motion (ROM). In this randomized control trial, 30 participants (age = 24.03 ± 3.11yrs, height = 170.52 ± 9.45cm, mass = 75.67 ± 17.40 kg) volunteered. Participants received both taping applications with random limb allocation. ROM measurements were taken with a goniometer and inclinometer. Single leg sway velocity measurements were taken on the Bertec Balance Advantage. Each side was measured before tape application, immediately after application and four hours later. A 2-way repeated measures ANOVA ($\alpha < 0.05$) was used for data analysis. Both tapes demonstrated a significant decrease in ROM, but self-adherent tape showed greater ROM restriction over time. There were no significant findings in single leg balance over time. Although ROM slightly increased after four hours, both tapes acted as good external support to stabilize ankle joints over time in physically active populations.

82. Cupping Parameters Used by Athletic Trainers

Alex Harrison
Faculty Advisor: W. David Carr

Dry cupping therapy is a common soft tissue therapy used by athletic trainers (ATs) to aid in the treatment of patients. The purpose of this study was to gain a better understanding through face-to-face interviews of how ATs utilize cupping therapy, what drives their clinical decision making, and average cup pressures used. ATs are using three techniques for dry cupping: a form of static, moving, and static cup with patient range of motion. The duration (4.43 min +/- 2.66) and frequency (2.5 days +/- 1.80) of dry cupping varied amongst the participants, as well as average pressures (plastic 15.14inHg +/- 3.24, small silicone 8.31inHg +/- 2.31, large silicone 7.49inHg +/- 2.28). Of the three principles of evidence-based practice, clinical expertise was the most commonly cited reason for decision making. Dry cupping therapy utilization varies greatly amongst ATs.

83. Uniformity with NCAA Return to Learn Protocol Among Division I Universities/Colleges

Carly Beck, Elexis Calhoun, Madison Cronin-Burroughs, Cayce Sloan, W. David Carr
Faculty Advisor: W. David Carr

When rehabilitating an athlete suffering from a concussion, it is important that cognitive and physical stress on the brain be addressed. Return-to-play protocols have been widely distributed, while return-to-learn (RTL) protocols are still being introduced.
The purpose of this study was to explore RTL protocols within the National Collegiate Athletic Association (NCAA) Division I university setting. Publicly available documents found on the Internet for 351 Division I universities were reviewed to assess the current RTL process that is being implemented. Of the 351 institutions, 192 displayed a concussion policy. Of the 192 with a concussion policy, 154 had a RTL policy.
Results indicated that nearly half of the 351 institutions have a publicly available RTL policy. While making a policy publicly available is not a

requirement, it does raise the questions of how many are following a RTL policy.

84. Emotional Intelligence and Patient Satisfaction in Athletic Training: What is the Relationship?

Jessica Ziegelbein, W. David Carr, Mary G. Pesicka, Alexandra Orr, Tyler Hillstead
Faculty Advisor: W. David Carr

Objective: To develop a validated and reliable survey instrument that evaluates patient satisfaction within the context of emotional intelligence. Design: Our instrument mirrored an established instrument for measuring emotional intelligence with matching questions. We adjusted each question from the original instrument to evaluate satisfaction within the context of emotional intelligence, creating the patient satisfaction instrument. We validated the patient satisfaction survey utilizing expert review. We utilized a sample of convenience to pilot the new instrument. Clinicians were given the emotional intelligence instrument while patients were given the patient satisfaction instrument. Participants: Ten participants from a southwest Missouri university, 3 female and 2 male clinicians (μ =27.8 +/- 8.07) and 4 female and 1 male patients (μ = 19.4 +/- .894), were utilized. Data Collection/Analysis: Data was collected through quantitative surveys and collected anonymously. The data and informed consent documents are stored in principal investigator's locked office. The data was analyzed with a 2 tailed t-test. Results: Analysis found no significant differences. Conclusion: Though our results were not statistically significant, this research created a valid tool for assessing patient satisfaction in relation to emotional intelligence.

85. The Effectiveness of Passive Stretching on Active Ankle Range of Motion

Jessie Hubbs, McCall Christian, Jacob Hawkins, Ross Seitter
Faculty Advisor: McCall Christian

Limited dorsiflexion (DF) and plantar flexion (PF) motions at the talocrural of the ankle increase the risk of lower limb injuries during physical activity. Many therapeutic interventions have been proposed to help increase the motion. The purpose of this study was to examine the effect of passive stretching in the DF and PF positions on the range of motion (ROM) of the talocrural joint. A randomized controlled trial was conducted. Participants were recruited using a convenient sample. This study consisted of participants whose ankles were randomly selected to be in an intervention or control group. Using a goniometer, a pre-measurement of active ankle DF and PF ROM was recorded on both ankles. Participants were instructed on a series of four passive stretches that involved both PF (2) and DF (2) motions on the intervention limb. Stretches were performed statically in sets of 2, allowing one-minute in between each set. Post-measurements of ROM were taken for both ankles. The intervention was applied, and data was collected for three consecutive days. Due to the COVID-19 pandemic, the data collection and analysis was delayed, and is still underway. With research results are still pending, conclusion cannot be made at this time.

86. Exploratory Study of Patient-Clinician Interaction: Patient Values Within Orthopedic Rehabilitation

Kalen Davis, Derek Clayton, Connor Parrish, Emilee Pierce
Faculty Advisor: McCall Christian

Limited research is available relating to what patients 65 years or older (baby boomers) value in orthopedic rehabilitation. Due to the baby boomer population size and level of activity, there is a need to understand what they value in orthopedic rehabilitation. The objective was to gain an understanding of what is valued in patient-clinician interaction between athletic trainers and baby boomers within orthopedic rehabilitation. This study utilized qualitative mixed methods through semi-structured focus groups or telephone interviews. Nine participants (female = 6, male = 3, age = 68 ± 2) who had recently received orthopedic rehabilitation from a local clinic were interviewed (7 in focus groups and 2 one-on-one) to examine what they value within orthopedic rehabilitation.

Interviews were digitally recorded and transcribed verbatim into written text and coded using inductive methods. Results were triangulated to ensure trustworthiness. Based on the analysis of participants' interviews, 6 themes were identified: communication, education, patient-centered care, positive outcomes, motivation and compassion. The patient-clinician interaction profoundly impacted the patient's view of their care and outcomes.

87. The Effects of Exercise on Stress in Collegiate Athletes vs Collegiate Students Who Exercise Recreationally

Krista N. Johnson, Cole T. Bassett, Hayley M. Pfitzinger, Zachary M. Kersten
Faculty Advisor: Tona Hetzler

Current literature shows inconclusive results in the correlation between exercise and stress. This study aims to discover if any such relationship does exist, and if there are differences between college students actively participating in sport and those who exercise outside of a university sports team. The objective in this study was to compare the mental stress of collegiate athletes versus collegiate students who exercise recreationally. Ninety-eight participants between the ages of 18 and 25 completed paper surveys designed to determine their levels of stress and the way that their stress is affected by exercise. Data analysis is ongoing and is being assessed for frequencies and relationships between categorical variables using the chi-square test.

88. Do Certified Athletic Trainers Have Knowledge of Sports Nutrition and Hydration to Educate Athletes?

Jordan Newman, Abigail Castillo, Sydney Moore
Faculty Advisor: Tona Hetzler

Several studies have been conducted to better understand the knowledge athletes have regarding nutrition and where athletes get information regarding nutrition. However, there are limited studies showing the knowledge certified athletic trainers have to provide information to their athletes. The aim of this study was to investigate the knowledge of athletic trainers regarding sports nutrition and hydration. An online survey containing 24 questions was distributed through the NATA Research Survey Service to 3,000 certified athletic trainers in the collegiate, secondary school, and clinic setting. The survey was available for a four-week period. Following the survey closing, a chi-square analysis was performed to assess years of experience, highest level of education, setting, and level of confidence of the participants. Data analysis is currently in progress with the assistance of RStats. Results cannot be reported at this time.

89. Patient Reported Outcomes from NCAA Division II Athletes with Acute Low Back Pain

Austin Kuhl, Tona Hetzler, McCall Christian
Faculty Advisor: Tona Hetzler

Patient reported outcomes are widely used in healthcare, but the field of athletic training has been slow to implement them across the profession. The information received from these scales can help certified athletic trainers in the rehabilitation and treatment by getting the best available feedback from their patients and athletes. The purpose of this study was to implement patient-reported outcomes into treatment sessions to quantify pain scales and effectiveness of treatments with the certified athletic trainers' patient population. Eleven NCAA Division II student-athletes at a local university were selected. All student-athletes presented with acute low back pain lasting no more than 4 weeks and were given patient-reported outcomes scales to complete before treatment, after treatment, and within 24 hours of treatment. Lumbar flexion range of motion was collected at the same time points. Due to COVID-19, the analysis was delayed. Conclusion cannot be made at this time.

90. Factors That Impact an Athletic Trainer's Utilization and Implementation of Patient-Reported Outcome Measures

JoJo Hudgings, Alexa DeClue, Ryinne Jacquemin
Faculty Advisor: Tona Hetzler

Previously published research on certified athletic trainers highlights barriers that affect or limit the use of patient-reported outcome measures. Little-to-no research has been published on the characteristics of certified athletic trainers using patient-reported outcome measures in their clinical practice. The objective of this study was to examine the factors that impact an athletic trainer's utilization and implementation of patient-reported outcome measures. An online questionnaire was developed within Qualtrics and distributed to 3,000 ATCs (1,000 per each setting: college/university, hospital/clinic, and secondary school) through the National Athletic Trainers' Association Survey Service. Two hundred nineteen completed survey responses were collected. Currently, data analysis is ongoing, and results are not yet available.

91. Athletic Trainers' Knowledge and Perceptions of Specialty Certifications

Lyndsey Comer, Michael Hudson, Eva Frank, Kelsey LeMont, Taylor Adam
Faculty Advisor: Michael Hudson

The objective of our study was to understand the knowledge and perceptions certified athletic trainers have about athletic training specialties and specialty certifications. Furthermore, we examined the differences in participants' knowledge and perceptions between states with more and less restrictive athletic trainer practice acts. Based on published research, we developed and validated an online survey to measure their knowledge and perceptions. We recruited currently practicing athletic trainers via a cluster sample of states based on their practice acts. A total of 4,503 practicing athletic trainers received our e-mail, and we had 342 survey responses for a 7.6% response rate. While our response rate was low, we had an 87% completion rate with the survey. After a preliminary analysis of the overall data, the findings indicated practicing athletic trainers value specialty certifications and recognize the barriers with earning these certifications; however, athletic trainers may not possess a complete knowledge base regarding specialty certifications.

92. Is There an Asymmetry in Dorsiflexion on the Non-dominant Foot When Compared Bilaterally?

Savannah Jochem, Elijah Abdullah, Jeremy Hostetler
Faculty Advisor: Michael Hudson

Purpose: We have chosen to study this topic to provide athletic trainers with better awareness of possible asymmetries of bilateral ankle dorsiflexion. We hope this will be an interest for any athletic trainers dealing with asymmetrical sports. The purpose of this study was to examine asymmetries between dominant and non-dominant ankle dorsiflexion.
Methods: After the subjects consented to participating in our study, we asked them to keep their foot flat on the floor while lowering their body and bending their knee to the wall. We measured their weight-bearing dorsiflexion for both ankles.
Results: We collected data (and used mock data due to COVID-19) to compare range of motion (in degrees) of the dominant and non-dominant ankles. We used a paired t-test to analyze the data and establish if there was a significant difference or not.
Conclusion: We hypothesized our subjects would have a lack of dorsiflexion on their non-dominant foot compared to their dominant foot.

93. Does a Cervical Sensory Motor Control Oriented Rehabilitation Exercise Improve BESS Scores in Dancers?

Colten Morgan, Cerik Carter, Eric Davis
Faculty Advisor: Allan Liggett

Context: The study examined a cervical vestibular ocular training exercise and Balance Error Scoring System (BESS) scores. Research suggests dancers typically have hypermobility while lacking stability which could increase the risk of injury.

Methods: This was a randomized controlled trial of a convenience sample of 18 male and female members of the Missouri State University Theater and Dance Program. The sample was randomly assigned to a control or an intervention group. There was a pre- and post-test using a modified BESS test on an Airex® pad. The intervention utilized a head-mounted laser pointer and tracing lines on a target and maze, while the control group stood for five minutes
Results: A statistically significant difference was found between pre-test and post-test scores, $F(1,16) = 17.06$, $p < .001$, $\eta^2 = .516$. There was not a statistically significant difference between control and experimental group mean scores, $F(1,16) = .479$, $p = .499$, $\eta^2 = .029$. The interaction was not statistically significant, $F(1,16) = .01$, $p < .921$, $\eta^2 = .001$.
Conclusions: No significant difference between the intervention and the control group. BESS Scores were shown to improve with practice.

94. Functional Movement Screen Hurdle Step Strongly Correlates to Postural Sway During Single Leg Stance

Nathanael Comer, Nicholas LeGrand, Chad Linck, Allan Liggett, Susan Robinson
Faculty Advisor: Allan Liggett

Healthcare professionals are regularly concerned with core stability and its measurement. There is variation in definitions of core and core stability along with tests used to measure each. The purpose was to identify the validity of the Functional Movement Screen (FMS) hurdle step as a measure of core stability as compared to a Bertec Balance Essential single leg stance test on a force plate. Thirty-one participants completed three trials per leg on the hurdle step and the single leg stance. The hurdle step was scored on the typical FMS 0-3 (FMS-t) scale and the FMS 100-point (FMS-100) scale. The single leg stance was scored using a postural sway measured by the average velocity in degrees per second. A Pearson's correlation examined the relationship between FMS-100 and postural away. Results showed a statistically significant negative correlation between hurdle step and single leg stance scores, $r(26) = -.56$, $p = .003$. A Mann-Whitney U test indicated a significant difference between subjects with FMS-t scores of 1 and 2 and their respective FMS-100 scores. An independent t-test of subjects with FMS-t scores of 1 and 2 and their respective postural sway showed no significant difference.