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**Welcome to
the 21st Annual**

College of Health and Human Services

***Student
Research
Symposium***

Plaster Student Union
Thursday, April 27, 2017
3:30 - 5:30 P.M.

College of Health and Human Services

Student Research Symposium

Welcome to the twenty-first annual 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 presenting their scholarly activities. This is an opportunity to celebrate our students' outstanding work and to acknowledge the faculty members who serve as mentors.

College of Health and Human Services 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 CHHS Student Research Symposium Committee for their time and effort in organizing the symposium and printing posters for the students:

Dr. Christie Cathey, Psychology

Dr. Melissa Fallone, Psychology

Dr. Tiffany Havlin, Social Work

Dr. Michael Hudson, Sports Medicine and Athletic Training

Dr. Wafaa Kaf, Communication Sciences and Disorders

Dr. Florence Uruakpa, Biomedical Sciences

Dr. Jianjie Wang, Biomedical Sciences

Dr. Bogdan Kostic, Psychology

Mrs. Jan Rund, Executive Assistant

Ms. Jacqueline Patterson, Executive Assistant

Dr. Helen Reid

Dean, College of Health and Human Services

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1. The Effectiveness and Safety of Vacuum-Assisted Deliveries on Mother and Baby

Keturah Bruner

Faculty Advisor: Dr. Kathryn Hope, School of Nursing

A mother delivering a baby may have a prolonged second stage of labor, called dystocia, and need assistance to deliver her baby. Although a Cesarean-section (C-Section) is the most common method of assistance, vacuum extraction is another method of operative delivery. The purpose of this research review is to evaluate the effectiveness and safety of vacuum-assisted delivery (VAD) on the mother and baby. MSU's library databases were used to perform the literature review. Keywords used were vacuum-assisted delivery, safe infant delivery, cesarean section, vacuum-assisted vaginal delivery, forceps, 37 weeks, and second stage of delivery. Search limits used were studies that were published from 2010 to 2016, peer-reviewed, and with an abstract. Inclusion criteria also included primary research articles that addressed the effects and safety of vacuum extraction. Ten studies were used in the review. Based on the studies reviewed, there was evidence to support that VAD may sometimes be ineffective and cause harmful effects to the mother and baby. More research is recommended to increase the validity of these findings and give more information on vacuum extraction to patients in need of operative delivery.

2. The Effect of Instrument-Assisted Soft Tissue Mobilization on Range of Motion

Kylene Bauer, Megan Won

Faculty Advisor: Dr. Michael Hudson, Sports Medicine and Athletic Training

Context: There is a multitude of research regarding instrument-assisted soft tissue mobilization (IASTM) and how it affects range of motion (ROM); however, the rate of IASTM application has yet to be investigated. Objective: The goal of this study was to describe the acute effects on muscle ROM for different rates of IASTM. Design: Using a pre- and post-test experimental design, participants were randomly assigned to one of three treatment groups: fast rate, slow rate, or control. Methods: One researcher measured participants' triceps surae active-assisted ROM pre- and post-intervention. The second researcher applied lubricant to the participants' muscle complex, followed by a 20-second fast or slow rate IASTM treatment. Participants in the control group did not receive treatment and remained at rest for 20 seconds. We analyzed the data using a 2x3 mixed ANOVA. Results: There were no statistically significant differences in muscle ROM for the 3 treatment groups; however, the fast rate group exhibited a trend for greater ROM improvements.

3. Drury LEA Research

Ema Brzon, Haylee Kirkland

Faculty Advisor: Dr. William Paul Deal, Psychology

The Drury University Law Enforcement Academy (LEA) offers training and continuing education for law enforcement officers and others in the criminal justice community. Much of the law enforcement research associated with personality has addressed the predictive ability of various traits, i.e., Conscientiousness and Neuroticism, and subsequent employment performance. Very little research has examined the potential impact of law enforcement training itself on these characteristics. Broadly conceptualized, personality tends to be a relatively stable construct. It is possible, however, particular aspects of training in this area might be associated with changes in more narrow constructs of personality. Identifying those specific traits that might be most impacted through law enforcement training was the primary goal of this exploratory study. The NEO PI 3 was administered to approximately 250 LEA cadets over the past five years early in their academy experience and again immediately prior to graduation. The five broad factor and thirty narrow facet scales were examined to determine if any significant changes had occurred. Implications for the law enforcement community and suggestions for future research are discussed.

4. Effects of Interactive Metronome on Social Participation in Children with Autism Spectrum Disorder

Britney Ervin, Sapna Chakraborty, Tyler Leavitt, Patrick Mitchell, Courtney Soule

Faculty Advisor: Dr. Sapna Chakraborty, Occupational Therapy

Children with Autism Spectrum Disorder (ASD) commonly struggle with social participation. The purpose of this study was to examine the effects of Interactive Metronome (IM) on social participation in children with ASD. Two children age 7-10 years with a diagnosis of ASD participated in 30-minute IM sessions, three times per week for four weeks. Social participation was measured pre and post-intervention using the following assessments: Social Responsiveness Scale -2 (SRS-2), Social Performance Measure (SPM), and IM Long Form Assessment (LFA). Parents completed a post-intervention occupational questionnaire to assess changes in ADLs, IADLs, rest and sleep, education, work, play, leisure, and social participation. Results indicated improvement in SRS-2 and SPM scores for one participant and decline in the other. Both participants improved in timing on IM LFA scores. 50% (n=2) of the parents reported improvements in social participation with qualitative statements. Further research is warranted to indicate the plausibility of use of IM as a part of

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occupational therapy intervention to improve social participation in children with ASD.

5. Cricothyroidotomy

Matter Foster, Tony Roberts

Faculty Advisor: Tracey L. Poston, Biomedical Sciences

Emergency cricothyroidotomy is a last resort and potentially life saving intervention used in a 'can't intubate, can't ventilate' (CICV) situation. The incidence of CICV situations has decreased in recent years due to the introduction of the laryngeal mask airway (LMA). However, the Difficult Airway Society Difficult Intubation Guidelines states that in the situation of unsuccessful ventilation with an LMA, emergency invasive airway access such as an emergency cricothyroidotomy is required. An emergency cricothyroidotomy involves making an incision through the skin and cricothyroid membrane. Because of the rarity of the situation many anesthesia providers are not clinically proficient in this procedure. For this project a quick reference sheet was developed describing the emergency cricothyroidotomy in 4 steps. A questionnaire regarding the layout, clarity, and usefulness of the quick reference sheet, along with recommendations for improvement, was filled out by 45 Certified Registered Nurse Anesthetists at the 2017 Missouri Association of Nurse Anesthetists Spring Meeting. Although a small sample size, the questionnaires showed that CRNAs felt that the developed quick reference sheet would be helpful in a CICV situation.

6. Therapists' Perceptions and Use of Occupational Assessments in Acute Care

Victoria Leiber, Jordan Miller, Adam Schneider

Faculty Advisor: Traci Garrison, Occupational Therapy

Objective. This project gathered data related to formal and informal assessment utilized by occupational therapists in an acute care setting and explored their perceptions toward the use of standardized assessments.

Method. The researchers chose a qualitative phenomenological project. Each occupational therapist (N=15) participated in a semi-structured interview consisting of six questions with clarifying prompts. Interviews were transcribed manually and coded to identify relevant themes. **Results.** Therapists identified dressing, toileting, and grooming as the three main occupations they assessed in acute care. Sixty-seven (N=10) percent of therapists felt like a standardized assessment would be beneficial for objective outcomes, while the other 33% (N=5) felt as though the barriers of standardized assessment use outweighed the benefits. **Conclusion.** Acute care therapists in the Midwest assessed similar occupations when clinically evaluating patients. Perceptions for a possible

mandate were divided due to the variability of the setting. Further research needs to be conducted to determine what is necessary for an efficient standardized assessment in this setting.

7. A Meta-Analysis of Expressive Writing on Quality of Life and Posttraumatic Growth

Jeff Pavlacic, Erin Buchanan, Nicholas Maxwell

Faculty Advisor: Dr. Erin Buchanan, Psychology

Pennebaker (1997) suggests that expressive writing can reduce psychological distress associated with a traumatic event. The goal of this particular meta-analysis was to analyze the effectiveness of expressive writing on Posttraumatic Growth (PTG) and Quality of Life (QOL). Articles for the analyses were collected using Psych Info and Google Scholar with specified search terms. Estimated effect sizes were calculated using traditional meta-analysis techniques via fixed and random-effects models in R. Heterogeneity and power of studies were also calculated. Results suggest a small but consistent overall effect size for the effect of expressive writing on both QOL and PTG as well as low power and high heterogeneity between studies. Additional research is necessary in order to discover the effectiveness of expressive writing on PTG and QOL, as the few studies found published were found to be underpowered to detect significant changes in outcomes from expressive writing.

8. Memory for License Plates

Anna Martin, John Scofield, Bogdan Kostic

Faculty Advisor: Bogdan Kostic, Psychology

License plates in some states, including Missouri, use a format in which numbers are intermixed with letters (e.g., AB1-C2D), while in other states letters and numbers are separated into groups (e.g., ABC-123). Previous research has shown that memory for license plates is superior when letters and numbers are separate. The current research investigated whether memory for license plates in the Missouri format could be improved if numbers and letters appeared in different colors. Participants viewed a series of 100 sample license plates with six characters (four letters and two numbers) in the typical Missouri format. In one group, all license plate characters appeared in black text on a white background. In another group, only the letters appeared in black text while the numbers appeared in red text, also on a white background. Participants in both groups saw each license plate for half a second, waited six seconds, and then had ten seconds to recall as many characters as possible in the correct order. Contrary to the hypothesis, results did not show a significant difference in memory performance between the black text group (M = 8.61, SD = 1.56) and the colored text group (M = 8.76, SD = 1.76), $t(75) = 0.38, p = .71$.

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9. Occupational Therapists' Investigation of the Bioness Integrated Therapy System to Affect Reaction Time

Kaya Riemann, Fiona Potempa, Travis Franz, Rahul Dasari
Faculty Advisor: Tara Boehne, Occupational Therapy

Objective: This project examined the ability of the Bioness Integrated Therapy System (BITS®) Single Target program to influence upper and lower body reaction time within a normative sample of 24 healthy adults. Modalities such as the BITS can be used to prepare individuals for functional activities. **Design:** A nonconcurrent A-B-A design was utilized. The Human Benchmark© reaction time test program was administered before and after BITS® Single Target program intervention. The BITS was implemented twice a week for 3 weeks. **Results:** No significant effect was found, indicating that the BITS® Single Target program does not significantly affect upper or lower body reaction time when used as an occupational therapy intervention. No significant difference was found among pretest and posttest means for upper and lower body reaction time. **Conclusions:** Current research does not support the BITS® Single Target program as an occupational therapy intervention to significantly increase upper and lower body reaction time. Future research may benefit from assessing how meaningful participants perceive use of the BITS®. Future research projects may aim to study the use of technology to address participation in daily activities.

10. Characterization of the Nucleotide Excision Repair Homolog Rad4 in *Tetrahymena thermophila*

Rachel Mullner, Joshua Smith
Faculty Advisors: Dr. Joshua Smith, Biomedical Sciences

Xeroderma Pigmentosum Complementation Group C (XPC) acts as the damage recognition sensor in the Global Genome Nucleotide Excision Repair (GG-NER) pathway to repair bulky adducts in DNA caused by ultraviolet light (UV). Mutations in XPC result in Xeroderma Pigmentosum (XP) - a condition characterized by increased UV sensitivity and risk of cancer. To further examine XPC and the various roles it plays in the cell, we used *Tetrahymena thermophila* - a binucleated ciliate. The larger Macronucleus (MAC) is transcriptionally active in the cell, while the smaller Micronucleus (MIC) is used to store genetic information to pass on during conjugation. By tagging the XPC homolog in *Tetrahymena*, Rad4, with Green Fluorescent Protein (GFP) and using DAPI to stain the nucleus, we can monitor the localization of Rad4 in both the MAC and the MIC after DNA damage with UV to determine its role in repair of silent versus transcription active DNA. Live cells with the GFP-Rad4 were viewed for localization following damage with 100 J/m² UV Light and localization was detected in both nuclei. Further experiments with other DNA damaging agents and tagging of other NER repair genes with GFP-Rad4 can now be studied to look co-localization after DNA damage.

11. Physicians' Knowledge of Athletic Training

Kinsey Cook
Faculty Advisor: Dr. W. David Carr, Sports Medicine and Athletic Training

Athletic Trainers (ATs) are health care professionals who collaborate with physicians to provide preventative services, emergency care, clinical diagnosis, therapeutic intervention and rehabilitation of injuries and medical conditions. The purpose of this research is to examine physicians' knowledge along with how to educate them on the profession of athletic training. Data was gathered via Qualtrics Research Suite online survey tool. The survey consists of 25 questions; 15 demographics/opinion, 1 Likert-scale, and 9 true/false questions. The survey was distributed to physicians in the Mercy, Cox, Jordan Valley and Taylor Health and Wellness health systems. Frequency statistics were calculated for the 112 physicians within 32 areas of specialization who participated. Results showed 59.5% of physicians have interacted with athletic trainers while only 31.5% refer patients to ATs. Physician confidence in their knowledge of athletic training averaged 2.5 out of 5 while knowledge based questions were answered correctly 80% of the time. Only 70% knew ATs are recognized by the AMA as health care providers. Results showed an adequate knowledge base of athletic training within non-sports medicine physicians.

12. Identification of Self-Perceived Occupational Performance Needs Within the Plain Community

Kristen Carnes, Mary Hannah Ivie, Laura Wilbert
Faculty Advisor: Dr. Ashlea Cardin, Occupational Therapy

Objective: To identify self-perceived occupational performance needs of the Plain community using a culturally competent needs assessment. **Methods:** Mixed methods were used to identify occupational performance capacities and develop the Promoting Life-Balance After Identification of Needs (PLAIN) Assessment. It consists of 34 scaled, occupational performance tasks, 11 educational options, and an open-comment box. Participants accessed a rural health clinic in Missouri. **Results:** Forty-nine assessments met inclusion criteria. The mean age was 44 years. Forty-three percent were male, 51% were female, and 6% were unidentified. Of those surveyed 67% were Amish, 2% were Mennonite, 8% were Amish-Mennonite, 14% were English, and 8% were unidentified. Seventy-five percent identified as never having trouble completing basic Activities of Daily Living and 63% as never having trouble with Instrumental Activities of Daily Living. **Conclusion:** Participants ranked feeding, bathing, and dressing as highest functioning tasks and work, play, and community mobility as the lowest. Findings show the PLAIN Assessment may support culturally-sensitive and client-centered occupational therapy interventions and help shape future educational offerings.

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13. The Effects of Voodoo Band Application on Pain and Swelling in Acute Lateral Ankle Sprains

Matthew Loyd, Kristin Tivener, Brandon Hetzler
Faculty Advisor: Kristin Tivener, Sports Medicine and Athletic Training

OBJECTIVE: The objective of this study is to measure the short-term effectiveness of the Voodoo Floss Band V.S the ACE wrap at reducing inflammation and pain in ankle sprains. **DESIGN:** This was a randomized control trial design. **SUBJECTS:** Subjects included a convenience sample of volunteers (n=15) between the ages of 18-30 who were diagnosed with an acute lateral ankle sprain. **INTERVENTION:** Researchers conducted pre-intervention measurements of inflammation using the figure eight method and pain using the VAS. Participants randomly selected to a control (ACE wrap) or experimental (Voodoo Floss Band) group where they performed 5 cycles of ankle ROM, 2 minutes device applied, 1 minute rest while elevated. After intervention, participants Inflammation and pain were re-assessed. **RESULTS:** The experimental Voodoo Band group revealed a significant reduction of inflammation as compared to the control ACE wrap group post-intervention. The experimental Voodoo Band group revealed a significant decrease of pain post-intervention as compared to the control ACE wrap group post-intervention. **CONCLUSIONS:** The significant difference in the study reveals the effectiveness of the voodoo band vs the ACE wrap at decreasing pain and inflammation.

14. Compassion Satisfaction, Fatigue, and Burnout in Interdisciplinary NICU Team Members Caring for Infants with Neonatal Abstinence Syndrome: Implications for Neonatal Occupational Therapists

Melanie Gilcrease, Angela Marre, Kylar, Cassie Ewers
Faculty Advisor: Dr. Ashlea Cardin, Occupational Therapy

Introduction: This project explored the prevalence of compassion satisfaction (CS), compassion fatigue (CF), and burnout in interdisciplinary neonatal intensive care unit (NICU) caregiving team members working with infants diagnosed with neonatal abstinence syndrome (NAS). **Methods:** Caregivers were asked to identify occupational therapy (OT) interventions that would influence these constructs. Twenty-five NICU team members completed two surveys: The Professional Quality of Life (ProQOL) tool and an OT survey. **Results:** Mean scores for the level of CS, CF, and burnout among NICU team members was 41.64 (SD=4.67), 19.24 (SD=4.49), and 20.52 (SD=4.58) respectively. The top three OT interventions considered most beneficial by team members were: assisting medical professionals with hands-on caregiving; promoting infant calming, comforting, and self-comforting; feeding interventions and assisting family members with hands-on

caregiving resulted in a tie. **Discussion:** The qualitative statements from the survey revealed that caregivers experienced more stress than the ProQOL results reflected.

15. Lung Protective Ventilation Strategies: Using EtCO₂ as an Adjunctive Mechanism in Lung Protection

Eric Haynes, John Ikenroth, Bart Kuhns
Faculty Advisors: Dr. Tracey L. Poston, Dr. Monika Feeney, Nurse Anesthesia, Biomedical Sciences

Ventilator induced lung injury (VILI) causes poor outcomes in mechanically ventilated patients. VILI can result from short-term mechanical ventilation. Intraoperative lung protective strategies may reduce VILI. This systematic review was conducted to support intraoperative lung protective strategies. A literature review of randomized controlled trials of ventilation strategies using high vital volume (V_t), 10-12 cc/kg ideal body weight, and low V_t, 6-8 cc/kg ideal body weight, were reviewed. Randomized controlled trials that evaluated the efficacy of permissive hypercapnea were also reviewed. Findings included lung protective strategies reduce VILI in intraoperative patients. Low V_t with positive end expiratory pressure (PEEP) reduced pro-inflammatory mediator release. Permissive hypercapnea reduced pro-inflammatory mediator release and reduced mediator effects. Monitoring end tidal carbon dioxide (EtCO₂) aids in assessing permissible hypercapnea. High V_t's create excessive airway pressures. The most efficient strategy is to avoid high V_t's by limiting V_t to 6-8 cc/kg ideal body weight, allow permissible hypercapnea, and apply appropriate PEEP to maintain adequate oxygenation.

16. The Effect of Learning Methods on People's Judgments-of-Learning (JOLs)

Katherine Whisenhunt, Melissa Fallone, Bogdan Kostic
Faculty Advisor: Dr. Bogdan Kostic, Psychology

The current study examined the effect type of learning method had on people's judgments-of-learning (JOLs). Introductory psychology students were randomly assigned to one of two video conditions (lecture vs. interview), where they watched a YouTube video on volcanoes. Afterwards, participants answered review questions on the video's material while also predicting the probability of them answering a similar exam question correctly in the future. Participants were later tested using differently worded questions. Regardless of condition, participants were overconfident in their JOLs. Analysis of the results, shortcomings of the current study, and suggestions for future research are discussed.

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17. **Augmentative and Alternative Communication (AAC) Devices and the Occupation of Play: Parent Perspectives**

Kerry Tinklepaugh, Megan Pawloski, Brenna Pinkley, Sapna Chakraborty
Faculty Advisor: Dr. Sapna Chakraborty, Occupational Therapy

OBJECTIVE: This project examined parents' responses to questions about the occupation of play in their children who use an Augmentative and Alternative Communication (AAC) device. There is extensive research supporting AAC device use to improve communication; however, there is limited evidence how AAC devices influence the occupation of play. **METHOD:** Parents completed an adapted version of the My Child's Play Questionnaire, which addressed four categories of play behavior. Questionnaires were distributed at two speech-language pathology clinics that regularly interact with children who use AAC devices. **RESULTS:** Data were analyzed using descriptive statistics and an independent samples t-test. For children using AAC devices, parents noted decreased frequency of play behaviors in three out of four categories. However, parents reported that if their child had used an AAC device for more than one year, there was increased frequency of play behaviors in one category (Interpersonal Relationships). **CONCLUSION:** Results indicate that AAC devices may influence play. Occupational therapists would benefit from these findings by gaining knowledge on how to provide more meaningful and holistic treatment to children with AAC devices.

18. **A Survey of Aedes Species in Southern and Western Missouri to Assess the Risk of Zika and Other Aedes-Transmitted Arboviruses**

Olubusayo Daniel Famutimi, David M. Claborn
Faculty Advisor: Dr. David Claborn, Master of Public Health

Aedes. aegypti is the primary vector of Zika virus, though *Ae. albopictus* has also been implicated. The introduction of Zika virus into the mosquito population in Florida and Puerto Rico stirs concern about potential local transmission of Zika virus across states known to have *Ae. species*. This study aims to provide baseline data on mosquitoes in Missouri as an update and provide a basis for model-based predictions of future transmission of Zika virus as well as spread of other important arboviruses. From June to September 2016, we surveyed 28 counties in Missouri, with the selection of survey sites based on CDC estimates for presence of *Ae. aegypti*. Adult mosquitoes were caught using CDC light traps, CDC ruggedized light traps, Fay-Prince and BG sentinel traps, baited with either dry ice, octenol or both. Larval dippers and turkey basters were used to obtain larval specimens from standing and artificial

containers. 18,723 mosquitoes were collected from adult traps and emerged larval specimens. Overall, 43 species from seven genera were identified. No *Ae. aegypti* were found. Among *Ae. species*, *Ae. albopictus* had the highest trap rate (12.7 trap nights) and widest distribution of all mosquito species, occurring in 25 counties.

19. **Clinician Versus Self-Administered Suboccipital Release on Superficial Backline Function**

Colin Wilhite, Kristin Tivener, Karen Rakowski, Todd Daniel
Faculty Advisor: Kristin Tivener, Sports Medicine and Athletic Training

OBJECTIVE: The purpose of the study is to see if there is a difference in superficial backline function, as measured by toe touch distance, between a clinician administered and a patient administered suboccipital release. **METHODS:** The study employed a descriptive laboratory study with randomization in which 60 participants reported for a single data collection session, and were either put into a clinician or self-administered treatment group. Standing forward flexion distance served as the measurement of superficial backline function. **FINDINGS:** There was a statistically significant main effect for the intervention, $F(1,58) = 18.24$, $p < .001$, $\eta^2 = .239$, indicating that both the clinician administered and the self-administered groups improved from pretest (Pre $M = 4.74$, $SD = 7.96$) to posttest ($M = 6.79$, $SD = 7.58$). But there was not a statistically significant interaction of time and group, $F(1,58) = 18.24$, $p = .360$, $\eta^2 = .014$, indicating that neither group outperformed the other. **CONCLUSION:** This study demonstrates the effectiveness of a properly taught self-administered suboccipital trigger point release as equal in comparison to clinician administered treatment.

20. **Hypertension in the Low Income: Healthcare Provider Knowledge on JNC 8 Guidelines and Video-Based Patient Education**

Katie Peterson
Faculty Advisor: Dr. Rhea Faye D. Felicilda-Reynaldo, School of Nursing

Background: One in three adult Americans has uncontrolled hypertension. While is a universal problem, patients living in poverty experience poorer control of hypertension compared to those of higher income. **Purpose:** To examine the impact of an educational intervention to hypertension control in a low-income population. To evaluate trends of technology use in patients with limited income. **Methods:** A total of 80 low-income patients in a primary care community setting (MSU Care Clinic) completed a survey and were given a hypertension educational brochure with information on how to access additional online, video-based

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education. Ten of eleven healthcare providers at the clinic were educated on the JNC 8 guidelines with pre and posttest analysis. Results: There was a statistically significant decrease in blood pressure from the first visit (Mean: 149/95) to the second follow up visit (Mean: 135/87) after the education. Healthcare providers had a significant increase in posttest score after education on the guideline. Conclusions: Findings suggest that the decrease in blood pressure may be related to providing patient education via the hypertension brochure and health care provider education.

21. Anesthesia Provider Substance Use Disorders: Reporting, Recovery, Reentry, Relapse, and Recommendations

Leann Cockrell, Jennifer Brydson

Faculty Advisor: Dr. Tracey Poston, Biomedical Sciences

The issue of substance abuse and misuse has long been an issue in the practice of anesthesia risking not only patient's lives in the hands of unsafe practitioners, but also the lives of those practitioners who do not get help with recovery from their addiction. In fact, rates of misuse are estimated to be as high as 25 percent of anesthesia practitioners. This study explores the current data on the subject of substance abuse among anesthesia providers, as well as their reentry into practice, rates of relapse and return to practice. In addition, the paper evaluates a study done at Missouri State University aimed to assess knowledge of students and graduates regarding laws and process implementation surrounding substance abuse, reporting and return to practice. The study showed that the 2 groups were similar in their knowledge gaps, indicating an area of need for awareness and support. Project completion includes continuing to promote awareness, education and reporting of individuals by following the recommendations of the AANA. It is recommended to continue promoting awareness, education and reporting of individuals suspected to be misusing substances, according to the guidelines and recommendations of the AANA.

22. Time-Outs: Perceptions of CRNAs and SRNAs

Leann Cockrell, Jennifer Brydson

Faculty Advisor: Dr. Tracey Poston, Biomedical Sciences

In 2000, increased public awareness of the high rates of preventable medical errors fueled demand for improved patient safety. Initiatives mandated by the Joint Commission on Accreditation of Healthcare Organizations (TJC) necessitated a physical and verbal checklist prior to any invasive patient procedure. TJC termed it a time out procedure. Facilities accredited by the TJC are required to form policies/protocols and document staff education on time out procedure completion. Despite initiatives, TJC

reported wrong patient, wrong surgery, and wrong site mistake rates increased in 2015. A 10 question, cross-sectional research survey was utilized to identify causes of failure of the time out procedure. The results identified 73.1% respondents who observed a surgical procedure start without a time out being performed and (62%) identified the surgeon as a barrier in completing the time out procedure. Research shows that interventions include education for surgical staff on preventable error rates, correct time out completion requirements and scripted dialog may assist staff members and increase compliance and patient safety rates.

23. What is the Incidence of ACE Inhibitors Causing Refractory Hypotension in the Perioperative Environment, and the Subsequent Effective Treatment Modalities?

Dione Blansit, Melinda Green

Faculty Advisor: Dr. Tracey Poston, Biomedical Sciences

Angiotensin converting enzyme inhibitors (ACEI) are a frequently prescribed class of drugs used to control hypertension. This project was completed to determine if a connection between perioperative use of ACEI and post-induction hypotension exists and what drugs are being administered as treatment. A retrospective chart review analyzed 221 patient charts based on whether ACEI were taken within 48 hours of general anesthesia induction. The charts were divided into three groups: A, B, and C. Groups A and B were prescribed ACEI, but Group C was not. A included 80 patients who had taken ACEI within 48 hours. B included 39 patients who had not taken the prescribed ACEI within 48 hours. The control group, C, comprised 102 patients that were not prescribed nor taking an ACEI. No statistical significance was found in patients experiencing hypotension among the groups, and no patients, from any group, were treated with either vasopressin or methylene blue. Current literature empirically states that the drug of choice for post-induction hypotension in patients taking ACEI is vasopressin or methylene blue. It is recommended that guidelines be developed for their use.

24. What Effect Does Lacrosse Ball and Cupping of the Gastrocnemius Have on Increasing Ankle Dorsiflexion?

Ariana Fakeri, Ian Smith, Kennia Merlos, Brandon Neds
Faculty Advisor: Dr. Allan Liggett, Sports Medicine and Athletic Training

Objective: Compare the effects of lacrosse ball and cupping therapies on ankle dorsiflexion. Design: Quantitative study using pre-test and post-test experimental design.

Participants: Included a convenience sample of 69 Missouri State University students, from 18-30 years of age. Each group had 23 participants. Data collection/analysis: We collected data through three groups, two experimental and

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one control. One researcher distributed and collected consent forms, then marked three common trigger points on each participant. Each participant self selected color tiles from a box that would determine what group they were in. Two researchers took ankle dorsiflexion measurements before and after treatment. Both researchers were blinded to what color indicates what treatment. Of the pair, one researcher set up the goniometer while the other read the measurement. The fourth researcher was the one to distribute the treatments. Results: Our data was analyzed using SPSS with a multi-factor ANOVA. They concluded that for each treatment group there was a significant difference between the before and after measurements, but no significant difference between the groups themselves. All researchers took part in the analysis of the data.

25. Adherence to Principles of Motor Learning in Practice Format and Distribution by Volleyball Coaches

Olivia Brand

Faculty Advisor: Dr. Alana Mantie-Kozlowski,
Communication Sciences and Disorders

The adherence to motor learning principles when teaching/coaching motor-based activities has the potential to enhance the acquisition, retention, and transfer of skills for learners. The purpose of this study was to obtain information on coaches adherence to previously trained principles of motor learning specifically regarding practice format and distribution. A sample of 137 volleyball coaches completed a survey of sixteen questions distributed through email lists. All coaches had participated in training regarding motor learning principles including the probed topics of practice format and distribution through "IMPACT" certification. Coaches with more years of coaching experience reported better adherence to the principles of motor learning concepts of massed versus distributed practice; part versus whole practice; and random versus blocked practice. Experience correlated well with self-reported claims of increased adherence to the principles of motor learning with regard to practice distribution. Future studies will focus on self-report verses behavior during a live practice session.

26. Adherence to Principles of Motor Learning and Use of Feedback by Volleyball Coaches

Megan Holthoff

Faculty Advisors: Dr. Sarah Lockenvitz, Dr. Alana Mantie-Kozlowski, Communication Sciences and Disorders

When teaching/coaching motor-based concepts, incorporating the principles of motor learning may assist in the acquisition, retention, and transfer of skills. This study's purpose was to obtain information on adherence to principles of motor learning regarding the content and conditions of coaching feedback, which were explored using a descriptive survey. Contents of motor learning

feedback included the timing of when feedback was provided, meaning behind the verbal instruction, and type of feedback. Volleyball coaches (N=137) who had previously received both written and instructional training regarding motor learning principles completed an online survey of sixteen questions. More years of personal coaching experience did not correlate well with adherence to the assessed principles. Coaches who were more experienced did not report that they necessarily provide verbal feedback in a manner that was considered best practice by many who research and report on feedback paradigms for transforming motor behaviors. Since the implications were self-reported, the results will aid in the construction of framework for a future observational study to investigate if the reported survey data is consistent with feedback use during live practice.

27. Are Anesthesia Providers' Perception of Time During Pre-Oxygenation Allowing Proper Denitrogenation?

Syreeta Billings, Olivia Nwachukwu

Faculty Advisor: Dr. Tracey Poston, Biomedical Sciences

Pre-oxygenation is a technique to replace nitrogen with oxygen in the functional residual capacity (FRC) of the lungs; a process referred to as denitrogenation. Analysis of the length of time that practitioners pre-oxygenate patients prior to induction of general anesthesia for surgery was completed using an observational technique. Participants were asked to judge a three-minute time interval without access to timing devices. Three groups of students were assessed in different stages of anesthesia clinical preparation. Data collection indicated that practitioners were pre-oxygenating for a mean of at least three minutes. The collected data was disseminated via a Powerpoint and presented to current first through third year anesthesia students. Emphasis was placed on the importance of denitrogenation and some techniques used for preoxygenation.

28. Impact of Relationship Priming on Self- Actualization and Self-Concept

Summer Harvey, Jeff Pavlacic, Johnathon Sparks

Faculty Advisor: Dr. Melissa Fallone, Psychology

Self-esteem and self-concept are considered important concepts within psychology and may be precursors to self-actualization. Relationship quality, self-esteem, and self-concept are shown to be related. However, experimental research is lacking. Therefore, the purpose of this study was to address the current gap in literature, by examining the influence of friendships on self-esteem and self-concept. Participants (N = 268) were randomly assigned to one of three affective friendship priming conditions. Participants in each priming condition worked for 10 minutes to solve a word search puzzle. The puzzles were embedded with

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words that were related to either positive friendships (positive condition), negative friendships (negative condition), or were not related to friendships (neutral condition) before completing measures of self-esteem and self-concept. We hypothesized that participants in the positive affective friendship priming condition would score higher on both the self-concept and self-esteem measures. The data did not support the hypothesis. Limitations of the study are discussed and a revised study aims to address the limitations.

29. How Prior Beliefs Effect Hindsight Bias

Abigail Van Nuland

Faculty Advisor: Dr. Harry Hom, Psychology

Introduction: Previous research has shown that prior beliefs have no effect on hindsight bias (Masnick & Zimmerman, 2009) but they failed to use a foresight condition. The focus of this investigation is on how prior beliefs influence individuals' judgments for acquaintance rape. Method: A 3 (Prior Beliefs: None/ Positive/Negative) X 2 (Foresight, Hindsight) factorial design was utilized. When they have read the story, participants were asked to answer questions measuring hindsight bias. Results: Too few participants chose opposing viewpoints to analyze the original hypothesis (Yes = 29, No = 229, None Given= 165). Measures of Inevitability (e.g. the outcome was the only was possible) were found to be significant in a between groups ANOVA [$F(1,207)=21.036, p<.05$]. Conclusion: This study showed the traditional hindsight bias response when the participants had to give a belief. One common theme seen in these results is a strong presence of the cognitive input of hindsight bias. This means that we distort our memory of events to make sense of the scenario in hindsight. The participants recognize that the assault was Jack's fault, but also believe that Sophie should have seen it coming.

30. The Relationship Between Auditory Sensory Gating and the Big Five Personality Traits

Abigail Van Nuland, Lauren Gaunt, Elizabeth Bucy,

Rebecca Knoph, Carly Yadon

Faculty Advisor: Dr. Carly Yadon, Psychology

Sensory gating refers to the brain's ability to selectively process incoming sensory stimuli. Some evidence suggests that personality may be related to sensory sensitivity as measured by sensory thresholds. Sensory gating is assessed at three middle- latency auditory evoked potentials: P50, N100, and P200. We predicted that participants with more robust sensory gating would be more conscientious, more agreeable, and less neurotic. Fifty-seven undergraduate students met inclusion criteria and participated in an electroencephalogram (EEG) paradigm where scalp-derived

data were recorded (Cz) as they listened to a paired-tone sensory gating paradigm through headphones. Participants also completed the Big Five Inventory (BFI). Our sample exhibited the typical sensory gating response for both the P50, N100 and P200 components. Participants with better P50 gating were more conscientious, with better N100 gating were more agreeable, and with better P200 gating were less extroverted. Our results suggest that sensory gating, an early, protective neurological mechanism, may be related to higher-order behavior such as personality.

31. The Effects of Goal-Setting on Teambuilding and Challenge Course Outcomes

Lauren Gaunt

Faculty Advisor: Dr. Melissa Fallone, Psychology

The purpose of this study was to examine the effects of goal-setting on the outcome of teambuilding activities. Researchers have found that outdoor challenge courses provide an opportunity for learning by offering novel experiences to participants (Davidson et al, 2016). The specificity, difficulty and orientation of goals set by participants are also conducive to learning and performance on a task (Kleingeld et al, 2011). In the current research study, participants set groupcentric or egocentric goals before engaging in ropes course activities, and pretest-posttest surveys were used to measure their outcome. The researchers predicted that participants who set goals before participating in teambuilding activities would have a greater increase in scores than those who did not set goals, and that participants who set groupcentric goals would indicate a greater increase in scores than participants who set egocentric goals. Based upon the results from 3 (Goal setting) X 2 (Pretest-Posttest) mixed ANOVA, a significant effect of goal type between pretests and posttests was not found, but a significant effect was found within-groups for pretest-posttest scores for social skill, social identity, problem solving and emotional intelligence.

32. Collegiate Athletes' Knowledge and Perception of Athletic Training

Lindsay Hampton, Anne Tabora, Tricia Wankum

Faculty Advisor: Dr. Allan Liggett, Sports, Medicine, and Athletic Training

Abstract Collegiate Athletes' Knowledge and Perception of Athletic Training Lindsay Hampton, Anne Tabora, Tricia Wankum Objective: To evaluate collegiate athletes' knowledge and perception of the athletic training profession. Participants: 9 male and 32 female participants between 18-25 yrs currently in a sport at Missouri State University. Methods: Quantitative survey. Collected demographic information such as male and female, sport, and year in sport from a convenience sample of 398 Missouri State collegiate athletes. Used a previously

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validated 24 question survey: 12 questions testing knowledge and 12 questions testing perception. Created the survey through the Qualtrics system. Emailed the survey through the athletic director to the athletes twice over a two-week period. Results: Analysis still in progress. Separated the data into groups comparing male to female, high contact to low contact sports, and year in sport. Analyze the results using a between groups ANOVA.

33. **The Relationship Between Upper Thoracic Region Mobility and Overuse Shoulder Injury in Collegiate Swimmers**

Nao Kozawa, Allan Liggett, Gary Ward

Faculty Advisors: Dr. Allan Liggett, Gary Ward, Sports Medicine and Athletic Training

Objective: Examine the difference in upper thoracic region rotation range of motion (UT-RRROM) between collegiate swimmers with and without history of overuse shoulder injury. This study also investigated the relationship of UT-RRROM with characteristics of pain. Design: Cross-sectional design. Participants: Forty-six male (n = 22) and female (n = 24) collegiate swimmers. Intervention(s): UT-RRROM was measured in lumbar-locked position. History of shoulder injuries and characteristics of pain were obtained using a questionnaire. Independent t-test was used to determine if there was a difference in UT-RRROM between the group with and without history of shoulder injury. A correlation coefficient was calculated to examine the relationship between UT-RRROM and the frequency and significance of the pain. Results: There was no significant difference in UT-RRROM between the group with and without history of shoulder injury. There were poor correlations between UT-RRROM and frequency or significance of pain. Conclusions: No association between UT-RRROM and history of shoulder injuries was found among collegiate swimmers. Further research is needed to examine the association between thoracic region mobility and overuse shoulder injuries.

34. **Are You Drowning Your Patient? Recommendations for Fluid Resuscitation and Blood Product Replacement in the Operating Room**

Rachel Buerman

Faculty Advisor: Dr. Tracey Poston, Biomedical Sciences

The administration of fluids and blood products in the perioperative setting must be tailored to each individual patient and follow best-evidence based practice. Unfortunately, determining best practice can be difficult in the face of all the recommendation presented for such. The following study examined hemorrhage, evaluate articles regarding fluid and blood product replacement in the perioperative setting for both hemorrhaging and non-hemorrhagic patients, and included an appraisal of several studies regarding updated recommendations. Like with all

other aspects of the anesthetic plan, fluid resuscitation and blood product administration should be individualized to each patient. There are many different options for fluid management, including, but not limited to specific patient goals, monitoring equipment, and the types and volumes of fluid and case-by-case considerations regarding each recommendation should be evaluated prior to implementing.

35. **College Student Success: Overcoming Stereotyped Expectations with Perceived Social Support**

Sydney Young, Megan Drew, John Melone, Taylor Cook, Kimberly Koch, Taylor Smith, Adena Young-Jones
Faculty Advisor: Dr. Adena Young-Jones, Psychology

The present study explores the relationship of academic success with the basic psychological needs (i.e., autonomy, competence, and relatedness) and perceived social support of friends, family, and instructors. These components are examined in the context of historically underrepresented (i.e., generational status, ethnicity, and gender) college students versus those in traditional majority groups. This assessment of perceived social support is essential to creating beneficial and supportive environments for all students regardless of their background. Results indicate a relationship between motivation and group identities; concurrently, instructor support has the greatest impact on academic success. Many institutions assign advisors to each student, however, they neglect to emphasize the importance of these connections. Our research suggests that greater focus should be placed on resources and increasing promotion of instructor support regarding generational status of students.

36. **Combatting Test Trepidation: An Evaluation of Mindfulness Meditation and Expressive Free Writing**

Megan Culp, Austin Gordon, Zoe Ellis, Julie Baumann, Taylor Smith, Kimberly Koch, Adena Young-Jones
Faculty Advisor: Dr. Adena Young-Jones, Psychology

Test anxiety is common among students and leads to a variety of negative outcomes. This trepidation interferes with information retention and exam performance (Naveh-Benjamin et al., 1997; Rothman, 2004). Mindfulness meditation is one method that teachers may incorporate to reduce student test anxiety. Brown and Ryan (2003, 2004) define mindfulness as an open or receptive attention to and awareness of ongoing events and experiences. This nonjudgmental acceptance of one's experience(s) combats psychological distress caused by maladaptive cognitive processes. Similarly, expressive free writing decreases test anxiety and, therefore, improves exam scores (Ramirez & Beilock, 2011). The present study explores mindfulness meditation and expressive free writing to identify avenues for minimizing course related stress and helping students maintain psychological health. The results of our study

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showed no significant findings, however, a review of the trends revealed that expressively writing about summer plans had the largest effect on increasing positive mood while expressively writing about the exam had little, if not an adverse effect.

37. **Empathy Below the Surface: Assessing Perceptions of Role-Play Activities Within Academia**

John Melone, Megan Drew, Taylor Smith, Adena Young-Jones

Faculty Advisor: Dr. Adena Young-Jones, Psychology

Within academia, some administrators deem empathy training as "degrading" to stigmatized individuals. Ironically, a variety of role-playing activities are highly recommended in teaching methodology literature (Goldstein & Winner, 2012; Thompkins et al., 2015). Such techniques not only enhance recognition but prompt the desire for exposure to minority groups along with increasing respect and acceptance for the particular population (Goldstein & Winner, 2012). This study explored the issue of prejudice toward individuals with exceptionalities by incorporating simulated role-playing and perspective taking scenarios; specifically, we hypothesized that role-playing activities would not be perceived as "degrading", rather, they would enhance the outlook of individuals without disabilities. While most of our results were non-significant, we found an overall positive outlook on the role-playing activities ability to promote empathy and decrease stigma. We also discovered that as age increases, the perceived positive effect of the tasks on empathy increases. Further research could have participants actively partake in the proposed role-play activities rather than viewing them as hypothetical situations.

38. **Mindfulness Around the Globe: A Cross-Cultural Analysis of American and Dutch Students**

Austin Gordon, Megan Culp, Zoe Ellis, Lauren Rothweil, Taylor Smith, Kimberly Koch, Adena Young-Jones

Faculty Advisor: Dr. Adena Young-Jones, Psychology

Mindfulness, defined as an open and receptive awareness of the present moment, is a recent expansion to the Self-Determination Theory (SDT) of motivation (Brown & Ryan, 2003; Deci & Ryan, 1985, 2002). Hodgins and Kneep (2002) proclaim that mindfulness may facilitate well-being through self-regulated activity and fulfillment of the basic psychological needs: autonomy, competence, and relatedness. Additionally, Brown and Ryan (2003) found correlations between mindfulness levels and the basic needs. Similar results were evident among Dutch participants (Schoormans & Nyklicek, 2011). Based on these findings, our study compared mindfulness in both

Dutch and American cultures to directly determine the impact of basic psychological needs and perceived social support. Our results showed that mindfulness levels were related to the basic psychological needs as well as were predicted by perceived social support; particularly family support. In addition, Dutch students had higher levels of mindfulness overall. Further research could look deeper into the relationships that were found between Dutch and American mindfulness levels and their well-being.

39. **Vaccines**

Thomas Canales, Olivia Collins, Cheyenne Keck, Jessica Perkins, Eliza Smith, Dr. Richard Garrad

Faculty Advisor: Dr. Richard Garrad, Biomedical Sciences

Vaccines are used worldwide to immunize people against various infectious diseases. Although vaccines have already had a remarkable life-saving impact, access to vaccinations remains a major global health concern. Several world health agencies provide access and are striving to improve it. One obstacle to the use of vaccines is stigma and public misinformation, which can be found in both developed and developing nations. However, the future for immunization is bright. Research and development of new vaccines are underway, which could make diseases such as HIV and tuberculosis vaccine-preventable. Vaccination has already led to the eradication of smallpox, and progress is being made toward eradication of other diseases as well.

40. **A Descriptive Study: Clinical Interprofessional Education in Professional Athletic Training Programs**

Killian Flynn, Michael Hudson, Kristin Tivener

Faculty Advisor: Dr. Michael Hudson, Sports Medicine and Athletic Training

Context: The use and design of clinical interprofessional education within professional athletic training education is not well represented in the literature. Objective: Describe what types of health care professionals athletic training students are learning from in their clinical education. Data Collection: Stratified random sampling based on the college housing the athletic training program and trauma center location. Program directors were asked to report the number of health care professionals used in clinical interprofessional education and their roles. Barriers to IPE were ranked in regards to the academic institution and the health care facilities. Results: Athletic trainers (n=933) were the most common preceptor followed by physicians (n=144), physical therapists (n=137), and EMTs (n=47). The most common health care barriers to clinical IPE include availability (70%), administration (66.7%), and tradition (48%). The most common academic barriers are availability (67.9%), tradition (71.4%), finances (46.4%). Conclusion:

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Athletic training students are exposed to physical therapists, physicians, and EMT's, while the other approved professions are not used consistently.

41. Using Biofeedback and Motor Learning to Remediate Persistent Lispings

Justin Golay

Faculty Advisors: Sarah Lockenvitz, Dr. Alana Mantie-Kozlowski, Communication Sciences and Disorders

The principles of motor learning (PML) as applied to speech therapy have been known to facilitate motorically based disorders of speech and swallowing. To date, few studies have systematically combined biofeedback with PML to maximize the efficiency of goal acquisition in speech therapy. In this study, we established a treatment paradigm that combined evidence based and highly successful principles of motor learning and biofeedback. This poster includes descriptions of these principles and how they were applied in a treating an adult with persistent lispings.

42. Using Electropalatography and Principles of Motor Learning to Correct a Persistent Lisp: A Multiple Baseline Designed Study

Michelle Jones, Justin Golay

Faculty Advisors: Dr. Alana Mantie-Kozlowski, Sarah Lockenvitz, Communication Sciences and Disorders

Outcomes of a treatment program combining electropalatography biofeedback and principles of motor learning to remediate persistent lispings in regards to speech accuracy are described. The case study used a multiple baseline design across treatment objectives. Accuracy of speech productions was measured using visual and acoustic perception with two independent judges. This study highlights the benefit of a systematic approach to changing a habituated erroneous motor speech movement by pairing the use of biofeedback with systematic application of motor learning principles.

43. Preceptor's Opinions on Student Development Between Professional Degree Models

Daniel Almekinder, W. David Carr, Tona Hetzler

Faculty Advisor: Dr. David Carr, Sports Medicine and Athletic Training

Context: Athletic training is transitioning to a higher degree level. Direct research comparing student clinical development between degree models can aid in this transition. Objective: Compare preceptor's opinions on student clinical development between professional bachelor's and master's degrees. Design: Qualitative study with individual phone interviews. Setting: One university

offering both degree models. Participants: Five clinical preceptors representing three different settings. Main Outcome Measure(s): Grounded theory approach was used to create central themes. Member checks and multiple researcher analysis were used to establish trustworthiness. Results: Major themes included higher commitment, confidence, and professionalism in master's students over bachelor's students. Major differences were identified as a result of maturity levels and previous experience rather than clinical development. Conclusions: Based on these results, preceptors should be aware of the maturity differences in students and understand how this can impact clinical development. Preceptors should be aware that while students have higher maturity levels, the clinical development rate is similar to bachelor's students.

44. Using a Fluorescent Microscopy Assay to HIV-1 Uncoating in Microglial Cells

Ashlee Robinson, Alyssa Mondeaux, Amy E. Hulme
Faculty Advisor: Dr. Amy Hulme, Biomedical Sciences

Human Immunodeficiency Virus (HIV) currently infects 36.7 million people globally (1) and advances into Acquired Immunodeficiency Syndrome (AIDS), a life threatening state that impairs the immune system. HIV treatment requires drug innovation to inhibit HIV replication, or a vaccine that prohibits infection. In this study, we examined a crucial mechanism termed uncoating, which is the disassembly of the protective protein capsid of HIV to release the viral genome. Our goal is to gain further insight of the uncoating step to potentially hinder uncoating and hence hinder viral replication. Fluorescently labeled HIV virus was assembled that contained GFP labeled viral genome complex and Tomato labeled cell membrane. This virus was used to infect microglial cells prior to an antibody staining to detect the capsid protein (CA). Fluorescence microscopy was performed to image the fluorescent virus at various states of uncoating. At zero hours post infection we analyzed the colocalization between HIV, the viral membrane, and the CA. We will continue to examine uncoating by colocalization analysis of proteins at various times post infection. We hypothesize that uncoating will reach a maximum near 1 hour with some virus never uncoating.

45. The Influence of Implicitly or Explicitly Presented Ideas on Commitment

Cally Rolwes, Melissa Fallone, Charles Hoogland
Faculty Advisor: Charles Hoogland, Psychology

Previous research has shown that people can be heavily influenced by implicit beliefs, and may display more commitment and consistency toward those beliefs than conscious ideas. The present study tested whether implicit or explicit statements produced higher commitment rates in

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a scheduling survey. One hundred and thirty-four college freshmen and sophomores were presented an implied idea, an explicitly stated idea, or served as a control group. The implicitly and explicitly stated ideas centered on the concept that scheduling earlier classes leads to more success in school. Participants were also asked to complete the Big 5 Personality Test to check for differences in conscientious students and their ability to commit to the taking earlier classes. They then received a questionnaire to test for commitment. Statistically significant differences in the commitment check were not found. Participants also did not differ in their levels of conscientiousness, as expected. A positive correlation was found between conscientiousness and the commitment check. Additional research will need to be conducted to further understand the relationship between presentation and commitment.

- 46. The Relationships Among Dispositional Mindfulness, Depressive Thoughts, and Early Sensory Processing**
Kayla Kleinjan, Dallas Robinson, Cally Rolwes, Carly A. Yadon
Faculty Advisor: Dr. Carly A. Yadon, Psychology

Mindfulness is described as an accepting awareness and attentiveness to events and experiences. Trait mindfulness is related to elements of psychological well-being and may be correlated with physiological processes such as sensory gating. Sensory gating is a process the brain uses to filter out unnecessary sensory information, allowing for maximization of attentional resources. The functional consequences of poor sensory gating are not well understood. Fifty-seven students were administered an electroencephalogram (EEG) paradigm as they listened to a paired-tone sensory gating paradigm through headphones. Participants also completed the Mindful Attention Awareness Scale to assess their level of trait mindfulness and the Automatic Thoughts Questionnaire to assess frequency of negative thoughts. Higher levels of mindfulness were related to more effective sensory gating and lower frequencies of depressive thoughts. Interestingly, higher mindfulness scores were also associated with slower brain responses to the first tone presented. Better understanding the relationship between mindfulness and sensory gating has implications for both clinical groups and healthy individuals.

- 47. The Effect of Neuroimaging Evidence and Legal Standards on Sentencing: Implications in the Courtroom**
Dallas Robinson, Kelcee Rowlett
Faculty Advisor: Dr. Melissa Fallone, Psychology

Research shows that brain images have a disproportionately persuasive influence on the general public. The purpose of

this study is to further understand the impact of neuroimaging evidence on sentencing decisions in a population of potential future jurors (N=121). The presence or absence of neuroimaging evidence was manipulated, as well as which of the legal standard instructions, the M'Naghten Rule or the Model Penal Code, was presented with the case facts and psychological testimony. Results from participant's survey answers showed a significant difference between groups in how participants rated whether they agreed with the statement the defendant knew his actions were wrong at the time of the crime. Those in the conditions without neuroimaging evidence rated stronger agreement with the statement, indicating stronger belief in guilt. No main effect on sentencing decision was found for neuroimaging evidence or legal standard.

- 48. An Examination of the Use of Smartphones in the Professional Practice of Collegiate Athletic Trainers**
Candice Lohkamp, Kristin Tivener, David Carr,
Faculty Advisor: Kristin Tivener, Sports Medicine and Athletic Training

OBJECTIVE: To determine the frequency of use and investigate the perception of efficiency in collegiate athletic trainers' use of smartphones in their professional practice. **DESIGN:** Mixed-methods survey. **PARTICIPANTS:** One-hundred and one participants voluntarily completed the survey. **DATA COLLECTION AND ANALYSIS:** Using Qualtrics, a 13-question survey was randomly distributed by mass email to 1,000 collegiate athletic trainers across the United States. Likert scales were used to measure frequency and efficiency of the smartphone use and open text boxes were provided to gather qualitative data. Quantitative measures were analyzed using SPSS and qualitative analysis included multiple researchers to identify themes. **RESULTS:** Pending. **CONCLUSIONS:** Pending.

- 49. Effects of a Diaphragmatic Breathing Program on Functional Movement Screen Scores**
Sydni Kaden, Kristin Tivener, Karen Rakowski
Faculty Advisor: Kristin Tivener, Sports Medicine and Athletic Training

Objective: The purpose of this study was to investigate the short term effects of a diaphragmatic breathing program on patients' Functional Movement Screen scores. **Design:** This was a randomized controlled trial. **Subjects:** Participants included a convenience sample of volunteers (n=30) between the ages of 18-21 who had no current musculoskeletal injuries or a condition that would prevent them from completing the Functional Movement Screen. **Methods:** Researchers conducted pre Functional Movement Screens then participants were randomly allocated to either the control or experimental groups. The breathing program (experimental group) consisted of four weeks of breathing

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exercises that progressed each week and which were based off movements in the FMS. After completion of the breathing program, all participants (control and experimental) completed a post Functional Movement Screen. Results: Pending. Conclusion: Pending.

50. Does God Speak in Threes? Isaiah, Authorship and Latent Semantic Analysis

Caleb Marshall, Erin M. Buchanan
Faculty Advisor: Dr. Erin M. Buchanan, Psychology

This study used a multi-dimensional modelling technique, latent semantic analysis (LSA), to examine issues of authorship within the Biblical Book Isaiah. The Deutero-Isaiah hypothesis, which cites significant lexical and thematic differences within Isaiah as evidence for tripartite authorship, is popular among Biblical Scholars. This quantitative textual analysis explored two facets of Isaiah, authorship and thematics, using LSA, a multi-dimensional linguistic modelling technique. Following LSA, a simple correlation was calculated using chapter distance as the independent variable, with larger cosine values implying higher rates of relatedness. Analysis showed that distance was negatively correlated with cosine values ($r = -.22$, $p < .0001$). These results suggest that chapter distance within Isaiah is a significant predictor of thematic cosine strength. Because of the general thematic asymmetry across Isaiah, it is reasonable to conclude that a portion of Isaiah's thematic change is the result of multiple authorship. Further, our analysis helps demonstrate how computational linguistic work may be used to answer seemingly philosophical or subjective questions in other research fields.

51. Diaphragmatic Breathing After Activity Does Not Slow Heart Rate Faster Than Non-Diaphragmatic Breathing

Jessilyn Kelting, Kirsten McFarland, Brianna Hayner
Faculty Advisor: Kristin Tivener, Sports Medicine and Athletic Training

Objective: The objective of this study is to find if diaphragmatic breathing (DB) after activity will slow heart rate back to resting faster than non-diaphragmatic breathing.
Design: This was a cohort observational study design.
Subjects: Subjects included a convenience sample of volunteers ($n=30$) between the ages of 18-25 excluding those with asthma and injuries from within the last year.
Intervention: Baseline heart rates were taken of participants in a supine position for 1 minute, using a pulse oximeter. Participants were randomly split into experimental and control groups. The experimental group was taught DB then followed 30 second workout video. The control group only went through the 30 second workout video. The experimental group did DB after the video while we timed how long it took for their pulse to go down. Those in the

control were told to lie down and breath normally. Results: Heart rates in the experimental group returned to baseline faster than those in the control, but the difference was not statistically significant ($t(28) = 1.24$, $p = 0.23$). Conclusion: After activity, diaphragmatic breathing does not return heart rate back to baseline faster than non-diaphragmatic breathing

52. The Effects of Motivation and Goal Setting on Response Latency and Mental Effort

Jessica K. Willis, Derby A. Davis, Stacy L. Francis, Michael D. Mizer, Michael Z. Flores, Chris M. Olson, D. Wayne Mitchell
Faculty Advisor: Dr. Wayne Mitchell, Psychology

Researchers have found that performance is enhanced when participants set goals. According to Locke and Latham (2002), the goals must be specific, difficult, and perceived as attainable for performance to improve. Also, motivation contributes to performance. Specifically, intrinsic motivation, approach motivation, and avoidance motivation. Seventy-one participants were assigned randomly to one of two motivation groups; a Goal Setting or a Control and assessed over a series of memory problems; solvable and non-solvable. Participant's response latencies (RL) following a Non-Solvable problem was examined as a function of motivation type. Based upon the results from a 2 (Group) X 2 (Solvable Trials) X 2 (Post Non-Solvable Trials) mixed ANOVA, a significant Trials effect was found. Following a Non-Solvable trial RLs were found to be faster for both groups. Although no significant Group effect resulted, the Goal Setting group had slower RLs than the Control. Preliminary analyses of the relationship between motivation type and RL (cognitive effort) revealed that individuals high in motivation tended to respond faster in the Goal Setting Group, whereas Control Group participants high in motivation had slower RL.

53. The Benefit of Using Technology in Creating Resources to Develop the Transcription Skills of CSD Students Enrolled in Phonology Courses

Emily Wise
Faculty Advisor: Sarah Lockenvitz, Communication Sciences and Disorders

The purpose of this study is to determine how technology can be used to create resources that will facilitate the development of phonetic transcription skills. Research has been carried out through the extensive and thorough search of literature pertaining to methods and materials that have been successfully used to teach phonetics students. This includes exploration of the efficacy of utilizing technology in the classroom, the benefits of recorded as opposed to live transcription for new clinicians, and the need for both audio and video speech samples for student practice. The findings

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outlined in this research have been used as a basis upon which to create new class materials that, upon completion, will be utilized in the teaching of college level phonetics courses.

54. Determining the Most Beneficial Teaching Stimuli and Participants to Utilize for the Creation of Resources to Develop the Transcription Skills of CSD Students Enrolled in Phonology Courses

Evelyn Toppass

Faculty Advisor: Sarah Lockenvitz, Communication Sciences and Disorders

Some older adults in assisted living facilities feel isolated and lonely. The purpose of intergenerational visits at an assisted living facility is to reduce these feelings. Intergenerational meetings will provide positive interactions, therefore increasing the overall well-being of both parties. After an informal needs assessment, six residents volunteered to participate in the 4-session program. Post-surveys to assess satisfaction were then administered to both residents and student visitors. The findings of these surveys will be discussed. A limitation of this study was the short time-frame. Benefits of intergenerational interaction increase with time and should be supported for the long term.

55. Assessment of Reliability and Stability of Various Visual Search Parameters

Michael, D. Mizer, Stacy L. Francis, Jessica K. Willis, Derby A. Davis, Christina M. Olsen, Michael Z. Flores Wayne D. Mitchell

Faculty Advisor: Dr. Wayne D. Mitchell, Psychology

Objective: Determine if the Functional Movement Screen (FMS) has predictive value relative to incidence of non-contact injuries. Design: Cross-sectional retrospective study reviewing injury data on intercollegiate athletes at Missouri State University (MSU). Athletes' injury histories were cross-referenced with their respective FMS scores. Participants: Subjects were 301 Division 1 student-athletes at Missouri State University who participated in their sport between the dates of July 1, 2015, and June 30, 2016. Subjects included those athletes who sustained a non-contact injury that led to loss of playing time and those athletes who did not sustain such injuries. Data Collection/Analysis: Data was collected by reviewing each individual athlete's injury history during the time frame between July 1, 2015 and June 30, 2016 via the Athletic Training System (ATS) injury surveillance database. Each athlete received two FMS evaluations during the time frame aforementioned, and the earliest recorded score was used. The data analysis was a point biserial correlation. Results: The data analysis showed a 2-tailed significance of .067, demonstrating no correlation between FMS score and the incidence of non-contact injuries.

56. Characterization of Ubiquitin Conjugation Enzyme 2 Homologue in *Tetrahymena Thermophila*

Emily Schmoll, Caitlin McCann, Lauren Allen, Joshua Mettlach, Joshua Smith

Faculty Advisor: Dr. Joshua J. Smith, Biomedical Sciences

Rad51 and Dmc1 promote the homologous and strand exchange steps of homologous recombination. Dmc1 is a Recombinase involved in meiosis-specific repair of double strand breaks (DSBs) via homologous recombination; whereas, Rad51 has been found to be involved in meiotic and non-meiotic DSBs repair. Some studies in budding yeast show that when RAD51 is overexpressed, interhomolog recombination still occurs even when DMC1 is knocked out. It is still unknown whether Dmc1 and Rad51 interact directly, but evidence suggests that they may somehow work together. The aim of this study was to further define the role of Rad51 versus Dmc1 in *Tetrahymena thermophila* and determine if they interact with each other in a complex during the cell cycle and DNA repair damage. RT-PCR studies showed a possible role of Dmc1 in DNA repair outside of meiosis. Data suggested they may play both similar and distinct roles in meiotic recombination. Transformation of Dmc1 and Rad51 into *Tetrahymena* was done to further illustrate the correlation between them during DNA damage. The role of *Tetrahymena* Dmc1 and Rad51 in DNA repair has been elucidated through immunoprecipitation, fluorescence microscopy, and overexpression studies.

57. From Oxytocin to Health: Exploring the Relationship Between OXTR rs53576, Emotional Stability, Social Support, and Health

Colton Groh, Seth Dowler, Amber Abernathy

Faculty Advisor: Dr. Amber Abernathy, Psychology

The ciliate *Tetrahymena thermophila* contains 18 histone deacetylase (HDAC) homologs, which are responsible for removing acetyl groups from acetylated lysines on histones and other proteins. There is a class of HDACs called Sirtuins (Class III HDACs), which have been implicated in various cellular processes like cancer, diabetes, aging, apoptosis, and transcription regulation. The model organism *Tetrahymena thermophila* has 11 homologs of Sirtuins (four more than humans and other vertebrates even). The scope of this research is to investigate the genes homologous to human SIRT2 and SIRT3, *Tetrahymena* Histone Deacetylases (THDs) 13, 15, and 16. This study will investigate their expression levels within the cell under various conditions including genotoxic stressors, starvation, and conjugation using qRT-PCR. Localization studies will be done through cloning these genes into plasmids to encode for GFP and 2HA tags. These tagged constructs were then transformed into *T. thermophila* to be used in future studies. Characterizing the function, localization, and the proteins interacting with THD13, THD15, and THD16

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could help us better understand the various roles of SIRT2 and SIRT3 histone deacetylases.

58. Personal Promotion: Life Quality Enrichment Through Personality Change

Seth Dowler, Colton Groh, Amber Abernathy
Faculty Advisor: Dr. Amber Abernathy, Psychology

Telomeres are repetitive parts of the genome that act as a protective end cap to the chromosomes, and help protect the integrity of the genome. Telomeres have intricate secondary structures that interact with a set of proteins called shelterin that protect and structure the telomeres. A repair protein that has been understudied at the telomeres is Xeroderma Pigmentosum C (XPC), which plays a part in recognizing damage in the nucleotide excision repair pathway (NER). Due to the high amount of thymines found in the telomeres, telomeres are more susceptible to thymine dimers. To further understand shelterin and shelterin-like proteins relation to one another and in *Tetrahymena*, bioinformatics has been conducted to elucidate common domains between organisms. Currently, 2HA and FH6 RAD4 (*Tetrahymena*'s XPC homolog) tagged cell lines are being developed to study the localization of RAD4. These cell lines will then be used to study protein-protein interaction of RAD4 and Pot1a, Pot1b, and Tpt1 (*Tetrahymena* shelterin) before and after damage via chromatin immunoprecipitation. These interactions will begin to elucidate the manner in which RAD4, and in turn XPC, interacts with telomeres, and elucidate the pathway of NER at the telomeres.

59. Viral Fusion Rate of VSV-G Pseudotyped HIV-GFP in Microglial Cells

Zachary Ingram, Richard Martin
Faculty Advisor: Dr. Amy Hulme, Biomedical Sciences

Some older adults in assisted living facilities feel isolated and lonely. The purpose of intergenerational visits at an assisted living facility is to reduce these feelings. Intergenerational meetings will provide positive interactions, therefore increasing the overall well-being of both parties. After an informal needs assessment, six residents volunteered to participate in the 4-session program. Post-surveys to assess satisfaction were then administered to both residents and student visitors. The findings of these surveys will be discussed. A limitation of this study was the short time-frame. Benefits of intergenerational interaction increase with time and should be supported for the long term.

60. Coordinating Intergenerational Visits at an Assisted Living Facility

Melissa Russell
Faculty Advisor: Dr. Lisa Hall, Psychology

Some older adults in assisted living facilities feel isolated and lonely. The purpose of coordinating intergenerational visits at an assisted living facility is to attempt to reduce these feelings. Research shows the many benefits of intergenerational interaction for both parties. The researcher conducted an informal needs assessment through unstructured interviews and found that six residents volunteered to participate in the visiting program. Young adult volunteers, familiar to the researcher, came to the facility and spent approximately one hour, one-on-one, with an older adult. The researcher utilized participant observation and field notes, along with satisfaction post-surveys to assess the effectiveness of the program for both younger and older adults. The findings of the visiting program will be shared on a professional poster at the Student Research Symposium. A limitation of this study is the short time-frame and variability in number of visits among the participants. Benefits of intergenerational interaction increase with time and therefore should be implemented and supported for the long term.

61. Can Lower Extremity Strength and Lower Extremity Blood Flow Predict the Score on the Functional Gait Assessment in Cardiac Rehabilitation Phase II Patients?

Kayla Thompson, Chris Frye, Marcia K. Himes, Barbara S. Robinson, Jeanne L.
Faculty Advisor: Dr. Marcia K. Himes, Physical Therapy

Rad51 and Dmc1 promote the homologous and strand exchange steps of homologous recombination. Dmc1 is a Recombinase involved in meiosis-specific repair of double strand breaks (DSBs) via homologous recombination; whereas, Rad51 has been found to be involved in meiotic and non-meiotic DSBs repair. Some studies in budding yeast show that when RAD51 is overexpressed, interhomolog recombination still occurs even when DMC1 is knocked out. It is still unknown whether Dmc1 and Rad51 interact directly, but evidence suggests that they may somehow work together. The aim of this study was to further define the role of Rad51 versus Dmc1 in *Tetrahymena thermophila* and determine if they interact with each other in a complex during the cell cycle and DNA repair damage. RT-PCR studies showed a possible role of Dmc1 in DNA repair outside of meiosis. Data suggested they may play both similar and distinct roles in meiotic recombination. Transformation of Dmc1 and Rad51 into *Tetrahymena* was done to further illustrate the correlation between them during DNA damage. The role of *Tetrahymena* Dmc1 and Rad51 in DNA repair has been elucidated through immunoprecipitation, fluorescence microscopy, and overexpression studies.

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62. Gateway Fluorescent Tagging Plasmid System Targeting the *Btu1-1* Locus of *Tetrahymena thermophila* for the Study of Nucleotide Excision Repair

Jeremy Tee, Rachel Mullner

Faculty Advisor: Joshua J. Smith, Biomedical Sciences

The ciliate *Tetrahymena thermophila* contains 18 histone deacetylase (HDAC) homologs, which are responsible for removing acetyl groups from acetylated lysines on histones and other proteins. There is a class of HDACs called Sirtuins (Class III HDACs), which have been implicated in various cellular processes like cancer, diabetes, aging, apoptosis, and transcription regulation. The model organism *Tetrahymena thermophila* has 11 homologs of Sirtuins (four more than humans and other vertebrates even). The scope of this research was to investigate the genes homologous to human SIRT2 and SIRT3, *Tetrahymena* Histone Deacetylases (THDs) 13, 15, and 16. This study investigated their expression levels within the cell under various conditions including genotoxic stressors, starvation, and conjugation using qRT-PCR. Localization studies were done through cloning these genes into plasmids to encode for GFP and 2HA tags. These tagged constructs were then transformed into *T. thermophila* to be used in future studies. Characterizing the function, localization, and the proteins interacting with THD13, THD15, and THD16 could help us better understand the various roles of SIRT2 and SIRT3 histone deacetylases.

63. Understanding Malnutrition in Developing Countries: An Integrated Service Learning Experience in El Salvador

Jaime Gnau, Caroline Finnell, Maggie Goss, Meshia Jones, Kristen Keeney, Aubrey Snedeker

Faculty Advisor: Carmen Boyd, Biomedical Sciences

Six dietetics students joined the Missouri State dietetics program director to El Salvador over spring break of March 2017 to learn about malnutrition in developing countries. Convoy of Hope, a local agency that provides international aid and relief, hosted the group. Involvement in this international service learning course enabled the students to experience many learning opportunities such as visits to local schools to provide nutrition and hygiene education, as well as learn about local feeding initiatives through Convoy of Hope and local agencies. The students visited CENTA (similar to USDA) to tour the orchards and learn about local produce. Students also visited a local orphanage, serving food at a homeless shelter for seniors, and a visit to Pounds of Love (similar to WIC) to assist with anthropometric measurements of children. They also went to the World Food Programme to hear a presentation on their role in helping fight hunger in El Salvador as well as gain insight

on current nutrition issues. Students not only experienced the beauty of El Salvador and its people, but also developed a deeper understanding of issues caused by malnutrition, as well as strengthened confidence in helping to alleviate these problems.

64. Re-Examining the Non-Cognitive, Person-Centered Factors on Academic Success

Alex Pantze

Faculty Advisor: Dr. Carol Shoptaugh, Psychology

Telomeres are repetitive parts of the genome that act as a protective end cap to the chromosomes, and help protect the integrity of the genome. Telomeres have intricate secondary structures that interact with a set of proteins called shelterin that protect and structure the telomeres. A repair protein that has been understudied at the telomeres is Xeroderma Pigmentosum C (XPC), which plays a part in recognizing damage in the nucleotide excision repair pathway (NER). Due to the high amount of thymines found in the telomeres, telomeres are more susceptible to thymine dimers. To further understand shelterin and shelterin-like proteins relation to one another and in *Tetrahymena*, bioinformatics has been conducted to elucidate common domains between organisms. Currently, 2HA and FH6 RAD4 (*Tetrahymena*'s XPC homolog) tagged cell lines are being developed to study the localization of RAD4. These cell lines will then be used to study protein-protein interaction of RAD4 and Pot1a, Pot1b, and Tpt1 (*Tetrahymena* shelterin) before and after damage via chromatin immunoprecipitation. These interactions will begin to elucidate the manner in which RAD4, and in turn XPC, interacts with telomeres, and elucidate the pathway of NER at the telomeres.

65. Functional Movement Screen Does Not Predict Noncontact Injury in Collegiate Athletes

Tyler Triggs, Jacob Briggs, Jon Price

Faculty Advisor: Gary Ward, Sports Medicine and Athletic Training

Objective: Determine if the Functional Movement Screen (FMS) has predictive value relative to incidence of non-contact injuries. Design: Cross-sectional retrospective study reviewing injury data on intercollegiate athletes at Missouri State University (MSU). Athletes' injury histories were cross-referenced with their respective FMS scores. Participants: Subjects were 301 Division 1 student-athletes at Missouri State University who participated in their sport between the dates of July 1, 2015, and June 30, 2016. Subjects included those athletes who sustained a non-contact injury that led to loss of playing time and those athletes who did not sustain such injuries. Data Collection/Analysis: Data was collected by reviewing each individual athlete's injury history during the time frame between July 1, 2015 and June 30, 2016 via the Athletic Training System

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(ATS) injury surveillance database. Each athlete received two FMS evaluations during the time frame aforementioned, and the earliest recorded score was used. The data analysis was a point biserial correlation. Results: The data analysis showed a 2-tailed significance of .067, demonstrating no correlation between FMS score and the incidence of non-contact injuries.

66. Interplay Between the Homologs Rad51 and Dmc1 in Cell Division and Homologous Recombination Repair

Amaal Abulibdeh

Faculty Advisor: Dr. Joshua Smith, Biomedical Sciences

Rad51 and Dmc1 promote the homologous and strand exchange steps of homologous recombination. Dmc1 is a Recombinase involved in meiosis-specific repair of double strand breaks (DSBs) via homologous recombination; whereas, Rad51 has been found to be involved in meiotic and non-meiotic DSBs repair. Some studies in budding yeast show that when RAD51 is overexpressed, interhomolog recombination still occurs even when DMC1 is knocked out. It is still unknown whether Dmc1 and Rad51 interact directly, but evidence suggests that they may somehow work together. The aim of this study was to further define the role of Rad51 versus Dmc1 in *Tetrahymena thermophila* and determine if they interact with each other in a complex during the cell cycle and DNA repair damage. RT-PCR studies showed a possible role of Dmc1 in DNA repair outside of meiosis. Data suggested they may play both similar and distinct roles in meiotic recombination. Transformation of Dmc1 and Rad51 into *Tetrahymena* was done to further illustrate the correlation between them during DNA damage. The role of *Tetrahymena* Dmc1 and Rad51 in DNA repair has been elucidated through immunoprecipitation, fluorescence microscopy, and overexpression studies.

67. Characterization of the SIRT2 and SIRT3 Homologs in Tetrahymena Thermophila

Kyle Cook, Joshua J. Smith

Faculty Advisor: Dr. Joshua J. Smith, Biomedical Sciences

The ciliate *Tetrahymena thermophila* contains 18 histone deacetylase (HDAC) homologs, which are responsible for removing acetyl groups from acetylated lysines on histones and other proteins. There is a class of HDACs called Sirtuins (Class III HDACs), which have been implicated in various cellular processes like cancer, diabetes, aging, apoptosis, and transcription regulation. The model organism *Tetrahymena thermophila* has 11 homologs of Sirtuins (four more than humans and other vertebrates even). The scope of this research was to investigate the genes homologous to human SIRT2 and SIRT3, *Tetrahymena* Histone Deacetylases (THDs) 13, 15, and 16. This study investigated their expression levels within the

cell under various conditions including genotoxic stressors, starvation, and conjugation using qRT-PCR. Localization studies were done through cloning these genes into plasmids to encode for GFP and 2HA tags. These tagged constructs were then transformed into *T. thermophila* to be used in future studies. Characterizing the function, localization, and the proteins interacting with THD13, THD15, and THD16 could help us better understand the various roles of SIRT2 and SIRT3 histone deacetylases.

68. Investigating the Rad23 UbL Domain and Its Role in Nucleotide Excision Repair

Evan Wilson, Joshua J. Smith

Faculty Advisor: Dr. Joshua J. Smith, Biomedical Sciences

The ubiquitin chaperone/DNA repair protein Rad23 contains an N-terminal ubiquitin-like (UbL) domain that facilitates its interaction with the proteasome. Preliminary data in *Saccharomyces cerevisiae* suggests the UbL domain also plays a role in positively regulating nucleotide excision repair (NER) in a ubiquitin-dependent fashion, although the precise mechanism remains unclear. This study compares the UV sensitivity, ubiquitylation dynamics, and protein-protein interactions during NER in multiple strains of *T. thermophila* containing different Rad23 UbL mutations. Specifically, we will create different Rad23 UbL mutations using site directed mutagenesis followed by endogenous transformation of *T. thermophila*. We hypothesize that key Lys->Arg mutations will decrease or even prevent the ubiquitylation of the Rad23 UbL, causing a decreased rate of NER by blocking the Rad23-dependent stabilization of Rad4. If *S. cerevisiae* and *T. thermophila* employ a conserved mechanism for regulating NER, then this would provide strong evidence for the evolutionary importance of ubiquitin-mediated regulation of NER in promoting UV survival.

69. Characterization of Nucleotide Excision Repair at the Telomere and Role of the Repair Protein Rad4 and Its Association with Shelterin Proteins

Emily Nischwitz, Joshua J. Smith

Faculty Advisor: Dr. Joshua J. Smith, Biomedical Sciences

Telomeres are repetitive parts of the genome that act as a protective end cap to the chromosomes, and help protect the integrity of the genome. Telomeres have intricate secondary structures that interact with a set of proteins called shelterin that protect and structure the telomeres. A repair protein that has been understudied at the telomeres is Xeroderma Pigmentosum C (XPC), which plays a part in recognizing damage in the nucleotide excision repair pathway (NER). Due to the high amount of thymines found in the telomeres, telomeres are more susceptible to thymine dimers. To further understand shelterin and shelterin-like proteins relation to one another and in *Tetrahymena*, bioinformatics

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has been conducted to elucidate common domains between organisms. Currently, 2HA and FH6 RAD4 (Tetrahymena's XPC homolog) tagged cell lines are being developed to study the localization of RAD4. These cell lines will then be used to study protein-protein interaction of RAD4 and Pot1a, Pot1b, and Tpt1 (Tetrahymena shelterin) before and after damage via chromatin immunoprecipitation. These interactions will begin to elucidate the manner in which RAD4, and in turn XPC, interacts with telomeres, and elucidate the pathway of NER at the telomeres.

70. The Effects of Social Media Images of the Fit-Ideal on Self-Esteem, Body Dissatisfaction, and Motivation to Exercise

Heather Stephens-Cantu, Tori Ortiz

Faculty Advisor: Dr. Brooke Whisenhunt, Psychology

Social media body comparisons have generally been linked to decreases in self-esteem and body satisfaction (Hawkins, N., et al., 2005). Specifically, viewing images of the thin-ideal have been linked with decreases in body-satisfaction and increases in eating disorder symptomatology (Stice, E., et al., 1994). Less research has been done examining the impact of the more recent fit-ideal, but findings suggest that viewing images of the fit-ideal produce similar negative effects to body image (Tiggemann, M., & Zaccardo, M., 2015). The impact of viewing the fit-ideal is particularly interesting when considering that these images are portrayed in the media to be motivating people to be healthy and exercise. The purpose of this study was to examine the impact of social media images of the fit-ideal on self-esteem, body satisfaction, and motivation to exercise. Participants completed a two-part study examining the impact of viewing images of body-focused fitness ideals, motivational quotes, or a neutral stimulus.

71. Utilization of Interprofessional Education and Practice in Entry-Level Masters Athletic Training Programs

Lyndsey Brooks, Caitlin Canote, Sandra Roy

Faculty Advisor: Dr. W. David Carr, Sports Medicine and Athletic Training

Objective: Identify how interprofessional education (IPE) and practice (IPP) are utilized in professional masters athletic training programs that are in "good standing" with the Commission on Accreditation of Athletic Training Education (CAATE). Collection/Analysis: Potential programs were identified using public information on CAATE. The program directors were contacted and asked to participate in a survey, indicating whether their program uses IPE and/or IPP. Five were randomly chosen for a follow up phone interview discussing how IPE and IPP are used, what barriers they meet in implementation, and how they have overcome those barriers. The interviews were recorded, and one researcher transcribed the interviews. The

other two researchers performed the coding. All researchers took part in theme production and analysis.

Results: Data gained from the interviews showed IPE is implemented through joint coursework with various allied health programs. IPP is implemented through clinical rotations with various allied health professions. All programs stated involvement from all levels of students within the program. The top barrier to implementing IPE and IPP was being housed in a college different from other allied health programs.

72. High School Coaches' Knowledge of Athletic Trainers

Krystal Stump

Faculty Advisor: Dr. W. David Carr, Sports Medicine and Athletic Training

Context: Athletic Trainers (ATs) collaborate with coaches to provide quality medical coverage to the athletes.

Objective: Examine high school coaches' knowledge base of ATs in the Mid-American Athletic Trainers' Association (MAATA). Design: Cross-sectional survey. Data was gathered via Qualtrics Research Suite online survey tool.

The survey consisted of 19 questions; 6 demographics and open text, 1 Likert-scale, 9 true/false, and 2 multiple choice.

Participants: There was a total of 774 participants in this study from 17 states; 730 came from the inclusion states and 44 came from outside the inclusion states. Main

Outcome Measures: The variable being measured was coaches' knowledge. Results: Cross tabulation compared multi-sport coaches to knowledge. The results indicated 695 participants answered correctly on true/false knowledge questions. No significant findings were found in cross tabulation and ANOVA. Each state compared to knowledge was not significant, $F(8, 753) = 1.20, p = 0.297, (M = 7.05, SD = 0.12)$. Total sports to location was not significant, $F(62, 753) = 0.890, p = 0.711$. Conclusion: High school coaches within the MAATA know the skill set of ATs from daily interactions.

73. Characterization of the Effects of Etanercept Treatment (TNF- α Inhibition) in the Type I Collagen Glomerulopathy

Kimberlee Thompson, Randi Kerr, Grant Paterson, Isaac Springer, Jacob Sharon, Zachary Kram, Charlotte Phillips, Amanda Brodeur

Faculty Advisor: Dr. Amanda Brodeur, Biomedical Sciences

In chronic renal disease, the progressive accumulation of collagen in the mesangium results in fibrosis, glomerulosclerosis, and eventual renal failure. Mice deficient in pro α 2(I) collagen accumulate homotrimeric type I collagen in the mesangium. Picosirius red (PSR) staining was utilized to evaluate collagen deposition. Histological examination of kidney sections demonstrates that Col1a2-

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deficient mice exhibit abnormal glomerular collagen deposition when compared to wildtype littermates. To further explore the pathophysiology behind this deposition, we investigated the role of TNF-alpha using the same model and stain. We looked at male and female wildtype with vehicle (IgG1), wildtype with Etanercept (a TNF-a inhibitor), Col1a2-deficient mice with vehicle, and Col1a2-deficient mice with Etanercept. We initially hypothesized that TNF-a may play a role in the activation of mesangial cells to produce the collagen. After statistical analysis, we found no significant difference between deficient mice who were treated with the vehicle and deficient mice treated with etanercept. This data suggests that TNF-a does not participate in later stages of the disease. Its involvement earlier in the disease process remains to be elucidated.

74. **Zika Virus in Your Backyard: A Scary Epidemic**

Kyle Dillon, Abigayle McGrew, Katyann Obert, Shannon Pulliam, Jeremy Tee, Amanda Brodeur
Faculty Advisor: Dr. Amanda Brodeur, Biomedical Sciences

The Zika virus is a global health concern that continues to pose a threat to the human population. The viral nature of Zika along with changes in climate cause concern among the scientific community that in due time, Zika-carrying mosquitos will be knocking on each of our doors. Due to its role in the development of birth defects and neurological deficits in infants of infected mothers, the virus must be controlled- but a vaccine has yet to be developed. Making individuals more aware of the transmission routes of the virus, as well as mosquito control efforts may be our best defense against Zika until further biological technologies are developed. Different aspects of Zika are explored here to enhance understanding, raise awareness, and propose some unknown and unanswered questions about this perturbing epidemic before it becomes Zika in your backyard.

75. **Enhancing Personality: Using Behavioral Activation to Change Personality and Life Quality**

Caitlin Richmond, Carissa Ford, Amber Abernathy
Faculty Advisor: Dr. Amber Abernathy, Psychology

This study, using the goal-setting technique of behavioral activation, focuses primarily on enhancing the personality trait of conscientiousness. Previous research has shown behavioral activation to be beneficial in decreasing depression. This is the first study to examine the impact of behavioral activation on personality and health. Behavioral activation consists of a five week study challenging the participant to track and record his or her daily routine for a week, then incorporating fifteen new "target" activities into his or her daily routine for the remainder of the study.

These "target" activities range from easy to difficult to accomplished, and the participant is asked to do each "target" activity three days in a row in order to reach their goal and receive a reward of his or her choosing. Pre- and post- surveys are obtained in order to determine if goal setting and follow-through will improve personality and overall health. A sample of 30 participants ranging from ages 18-65 participated in the study. Results of the study discuss enhancing of personality and health due to the behavioral activation.

76. **Postural Training Impact on Pre-Existing Low Back Pain**

Se Hun Park, Tona Hetzler, Dave Hammons, Gary Ward
Faculty Advisor: Dr. Tona Hetzler, Sports Medicine and Athletic Training

Context: Many studies report a relationship between poor static posture (SP) and low back pain (LBP). Objective: Examine the effects of a vibrational feedback postural training program on pre-existing LBP. Design: Pretest-posttest study. Intervention: Control group wore pedometer and experimental group wore postural training device for three weeks. Participant answered a pain scale survey and had side-view pictures before and after intervention. Participants: Individuals in predominately-sedentary work environments (N = 31; 13 men, 18 women; age = 33.1 ± 13.3 years; height = 170.2 ± 9.7 cm; mass = 71.6 ± 17.5kg). Results: LBP discomfort decreased between the two groups [F(1, 18) = 6.25, P = .02]. Conclusion: Maintaining good posture may support healthy behaviors and does reduce LBP. The vibrational feedback from the device helps recognize new body posture and correct poor SP. Additional research is needed on the effects of vibrational feedback postural training programs.

77. **Antibiotic Resistance: A Global Health Concern**

Kylee Goddard, Lucy Beeler, Alyssa Mondeaux, Daniel Singer, Brandon Wellman, Colette Witkowski
Faculty Advisor: Dr. Colette Witkowski, Biomedical Sciences

In the struggle against disease and illness, medical providers are doing whatever they can to help. What happens when the agents used to fight bacterial diseases are no longer effective? This is the reality that society faces with antibiotic resistance. Becoming a problem on the global scale, it not only is keeping those that need medication sick, but also affecting our economics and future medical growth. Big pharmaceutical companies are not investing in research and development to produce new classes of antibiotics, and as a result the area of antibiotic research lags behind the growing advances and sophistication of other drugs that are more profitable. How can this problem be solved? Based on

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our research, the areas to invest in are research and developing new medicines, diagnostic tools, vaccines, and other interventions. We as individuals can also work on promoting better sanitation, hygiene, and infection prevention practices. To affect these initiatives it is necessary to increase our levels of education. By educating ourselves and others on what antibiotic resistance is, when and how to use antibiotics effectively, we can put into practice methods that will serve to increase health, and life, globally.

78. The Effect of Foam Rolling Duration on Hamstring Extensibility

Andrea Allison, Katherine Baker, Erika Mueller
Faculty Advisor: Dr. Tona Hetzler, Sports Medicine and Athletic Training

Context: Foam rolling (FR) is a commonly used intervention in clinical settings, but there is currently little research on the effects of duration. Objective: Examine the effects of different FR durations on hamstring extensibility. Design: Pretest-posttest study with three groups [1 minute (1FR), 5 minutes (5FR), control (NFR)] in a controlled setting. Interventions: Before and after treatment, each participant performed a stand and reach test. Treatment consisted of 1FR, 5FR, or NFR. Participants: 90 participants (45 males, 45 females) were randomly assigned a group: 1FR (30 participants), 5FR (30 participants), and NFR (30 participants). Based on the pretest, 49 participants were hyper-extensive, nine were hypo-extensive, and 32 had normal hamstring extensibility. Data Outcome: We ran a repeated measures ANOVA with between subject factor. Results: Data analysis found that compared to NFR, FR increased hamstring extensibility. There was not a significant difference between the 1FR and 5FR groups. $F=5.485$, $p=.006$. Conclusion: FR does improve hamstring extensibility; however, the improvement is not correlated with duration.

79. Effects of Somatosensory Stimulation on the Plantar Surface of the Foot on Postural Stability

Kenna Daugherty, Tona Hetzler
Faculty Advisor: Dr. Tona Hetzler, Sports Medicine and Athletic Training

Objective: Determine the effect of somatosensory stimulation on postural stability (PS). Design: Experimental study. Subjects: A convenience sample of volunteers (N=40) between the ages of 19 and 47; excluding those with a history of neuropathies, diabetes, multiple sclerosis, or Parkinson's disease. Intervention: Pre and Post-intervention measurements were taken using the Sensory Organization Testing on the Neurocom Balance Master to determine PS in double limb stance with 1) eyes open 2) eyes closed and

3) shifts in the platform. The experimental group performed 5 minutes of self-myofascial massage on the plantar surface of the each foot. The control group sat quietly for 10 minutes. Results: Data analysis is being performed to determine if somatosensory stimulation via self-myofascial massage has an effect on postural stability. Conclusion: Based on previous research, it is suspected self-myofascial massage will lead to increased somatosensory stimulation and improvement of postural stability.

80. Wii Fit and Lower Extremity Activation

Douglas Cordel, Tyler Daniels, Kristin Lanxon
Faculty Advisor: Dr. Sean C. Newton, Physical Therapy

Purpose: The purpose of the study was to determine the muscle activity of the gluteus maximus (GluM) and anterior tibialis (AT) during various Wii Fit games to assist clinical professionals in selecting the most appropriate game for their patients. Methods: Equipment; An electromyogram (EMG) and Nintendo Wii Fit system were used to collect data. Maximum voluntary contraction (MVC) was measured using a handheld dynamometer. Subjects: Eighteen healthy subjects; ten females, eight males. Procedure; max voluntary contraction was measured, and under electromyography, the subjects performed two minutes of each game. Readings were compared between average EMG reading vs that of the MVC. Results: The AT was most active at 14.58% and 12.04% muscle activation relative to MVC measurements during the Hula Hoop and Penguin Slide games, respectively. The GluM muscle was most active at 19.73% muscle activation relative to MVC during the Hula Hoop game. CONCLUSION: Overall, the AT was much more active than the GluM with the use of the Wii Fit. Practitioners can select appropriate Wii Fit game for the desired muscle activation. Research is needed to investigate whether a selected Wii activity translates to musculoskeletal changes.

81. Smoking Cessation: Implementation of Evidence-Based Guidelines to Decrease Smoking Rates at a Primary Care Clinic for the Underserved

Molly R. Aasby, Dr. Rose A. Utley
Faculty Advisor: Dr. Rose A. Utley, School of Nursing

Objective: To assess the effectiveness of provider education on the implementation of current smoking cessation guidelines and to evaluate the effectiveness of guideline-based interventions on patient smoking cessation in a primary care clinic for the underserved. Methods: Clinic providers were educated on guidelines for treating smoking dependence. Patients were provided with education on smoking cessation and an opportunity to discuss interventions with the provider. Patients returned for a three-month appointment, and smoking habit changes were

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evaluated. Provider and patient education were evaluated for effectiveness based on pre- and post-tests. Results: 84% of patients had a desire to quit in the future. Both provider and patient educational interventions were found to increase knowledge significantly. 35% of patients successfully reduced the number of daily cigarettes smoked. One patient reported complete cessation of smoking. Conclusions: Although limitations in sample size persist, the data suggests that the interventions, if reinforced and continued over an extended period, could increase the rates of smoking cessation and reduce the number of cigarettes smoked in the primary care setting.

82. Safety and Disaster Planning at an Independent Living Facility

Wilson Paul

Faculty Advisor: Dr. Lisa Hall, Psychology

Older adults in retirement communities deserve to be safe and to feel secure about their knowledge of natural disaster protocol. To this end, a multi-method three-phase study was conducted at an independent living facility. The first phase assessed residents' emergency preparedness through a researcher-administered questionnaire. The second phase relied on the assessment data to design an educational safety program for the residents. After the safety program was implemented, the third phase of the study re-assessed the residents' emergency preparedness by using a post-questionnaire, participant observation and field notes. The results of this study will be discussed along with the benefits and challenges of trying to ensure the safety of older adults in an independent living facility.

83. The Effects of a Music Program on Older Adults in a Long-Term Care Facility

Quinn Walsh

Faculty Advisor: Dr. Lisa Hall, Psychology

Music therapy is the use of musical intervention to elicit some kind of therapeutic benefit. Music therapy has been shown, in past research, to have extensive beneficial effects on quality of life. A music program was offered at a rehab and health care facility in order to gauge the degree to which patients benefit from a guitarist sitting among the older adults and singing songs from the 1950s and 1960s. Multiple methods were used to gather data and to evaluate the program including participant observation, field notes, unsolicited interviews, video recording, and a modified Cohen-Mansfield Agitation Inventory. Preliminary findings suggest that this music program inspired reminiscence, reduced behavioral problems, increased memory and improved social interaction between residents. More research is needed, over a longer period of time, to know whether this intervention has lasting effects.

84. Dust-Bunny Discussions

Jessica Spauldin

Faculty Advisor: Dr. Lisa Hall, Psychology

Relocation from a family home to a retirement community is an adjustment. Older adults who move to independent living communities reduce their square footage and therefore must downsize their property and belongings. Dust-Bunny Discussions is a two-step organizational program designed to encourage residents to (1) identify the collectibles and items that potentially cause them distress or embarrassment and (2) decide whether to eliminate or better store and display them. The methods used to assess residents' needs and evaluate the program include surveys, participant observation and field notes. Results indicate that encouragement leads to continued organizational efforts and that one-on-one "motivational clutter communications" improve quality of life. More retirement communities, especially independent living facilities, should consider offering organizational services, like Dust-Bunny Discussions, to their residents.

85. How Inter-Generational Interaction Produces Tech-Savvy Seniors

Eman Alabkari

Faculty Advisor: Dr. Lisa Hall, Psychology

Those on the younger side of the digital divide tend to think that technology has changed their lives for the better, but those on the older side might think it has changed their lives for the worse. Inability to use technology, today, can be inconvenient, lonely and demoralizing. The purpose of the Tech-Savvy Seniors program is to allow younger adults to assist older adults in learning to use cell phones, laptops and the internet for leisure, social interaction and to accomplish practical tasks. The methods used in this study include a needs-assessment questionnaire and a post-survey to measure satisfaction with one-on-one learning sessions and specialized classes that were held at a public library and at senior centers. Findings will discuss the number of older adults helped, the skills they developed, and their degree of satisfaction with the program. Inter-generational programs such as this one can minimize the digital divide and maximize quality of life.

86. Program for Programs (P4P) at Regional Hospice

Molly C. Taylor

Faculty Advisor: Dr. Lisa Hall, Psychology

Regional Hospice is comprised of six disciplines that work with the terminally ill and dying. Each discipline has a unique therapeutic program for patients. Currently, there is not a policy in place to ensure the programs are being delivered. There is no research literature that addresses the coordination of programs. Therefore, Program for Programs (P4P) was initiated to allow coordinated

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communication between the disciplines so that programs will be consistently delivered to patients. A survey was administered to each discipline's staff to understand the nature of and barriers to program delivery. Those findings were used to create a documentation protocol. This protocol enables staff to be aware of the status and sequence of program delivery and serves as an evidentiary basis for increased communication in weekly interdisciplinary meetings. Preliminary findings led Regional Hospice to permanently implement P4P. The P4P model could be useful to others involved in coordinated care delivery. More research is needed to assess the impact of consistent delivery of services to hospice patients. It is hypothesized that consistent delivery will increase the quality of programs over time and thus the experience of those using hospice.

87. Demonstrating the Usefulness of the RGA in an Assisted Living Facility

Alexa Surratt

Faculty Advisor: Dr. Lisa Hall, Psychology

The Rapid Geriatric Assessment (RGA) was developed by Saint Louis University and is part of the HRSA-funded Geriatric Workforce Enhancement Program (GWEP). The RGA can assess frailty, nutrition, sarcopenia, and cognitive function in five minutes. The RGA has been used in a variety of settings, but not in an assisted living facility. This demonstration project explored whether and how useful the RGA results are to residents, their families, the staff and the facility. Twenty volunteers, ten from the general assisted living unit and ten from the memory care unit, were assessed. These results and data gathered through participant observation and field notes were analyzed. Findings from the comparison of the two populations will be discussed in terms of their usefulness for residents and their families. It is too early to know how useful the RGA results are to staff and the facility. Limitations of this study are time constraint and small sample size; however, this study allowed one more person to be trained in the RGA and added twenty more assessments to the larger GWEP study, which will benefit older adults and further research in gerontology and geriatrics.

88. Write Your Own Life History

Rebekah Lee

Faculty Advisor: Dr. Lisa Hall, Psychology

Life review is the conscious act of recalling and processing the significant events in one's life. The benefits of life review are well documented in the literature. Still, many older adults do not realize the value of documenting their history or worse yet, they think no one is interested. "Write Your Own History" was an eight week program, held at a

recreation center, designed to encourage older adults to reminisce and record details about their lives. A 36-page document, consisting of 168 prompts about every stage of life, was given to older adult volunteers so they could preserve their memories in writing. Post surveys were administered afterwards to assess the impact of the program. Findings suggest that the experience made participants think about their past more often and remember more details than was expected. Latent results of the project included increased interaction among the attendees and the opportunity to bond with family members who viewed the finished product. Recreation facilities should consider implementing life review group classes into their programming due to the immediate benefits for the participants and the eventual benefits for loved ones.

89. It is Well: A Survey of Spirituality in Long-Term Care

Lori Whitten

Faculty Advisor: Dr. Lisa Hall, Psychology

The value of providing spiritual care to older adults is gaining importance as many mental and physical benefits are recognized. It is Well: A Survey of Spirituality in Long-Term Care focuses on identifying methods to meet spiritual needs and desires to improve quality of life for residents in long-term care (LTC). The author utilized a survey to gather self-reported needs and desires which were then compared to services offered in LTC facilities that meet needs and identify gaps in services. The author also gathered feedback through individual interviews, which allowed the residents to express their preferred level of spiritual support. The findings revealed residents fall into two patterns: (1) remaining in their room to pray, meditate or utilize the television to view religious programming or (2) partake in group activities such as Bible studies, devotions and church services. It is suggested that communication with residents continue in order to monitor physical limitations that may alter residents' involvement in spiritual activities. The connection between spirituality and well-being make it important that care providers be proactive in identifying and meeting the needs and desires of older-adults living in long-term care.

90. Paint Away the Stress in an Assisted Living Facility

Caitlin Shaver

Faculty Advisor: Dr. Lisa Hall, Psychology

To what degree does painting alleviate stress from the lives of older adults in an assisted living facility? Many residents have stressors such as decrease in function, difficulty adjusting to relocation, loss of control and loneliness, all of which can lead to or exacerbate depression. Paint Away the Stress is an art therapy program that was implemented as an attempt to reduce these stressors. The Perceived Stress

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Scale was administered to seven residents before the paint program began. After six painting sessions, or six weeks, the Perceived Stress Scale was re-administered to measure whether residents reported a reduction in stress. Data were also gathered via the qualitative methods of participant observation and field notes in order to understand the impact of the program on the participants' overall quality of life. Results from the pre and post assessments and findings from the additional methods will be discussed. Art therapy programs are affordable and modifiable for multiple ability levels; therefore, they should be regularly included in the activity schedules of assisted living facilities.

91. **Measuring Short-Term Memory Recall: The Impact of Color Scheme and Levels of Processing**

Haley Rask, Danielle Schicker, Jacqueline S. Byrket
Faculty Advisor: Melissa D. Fallone, Psychology

Color scheme and levels of processing factors have been shown to impact word recall proficiency. The current project sought to evaluate the interaction of these variables from an Educational Psychology perspective. Instructors often use slide projection software, such as Powerpoint, to supplement their lectures. These slideshows have the potential to distract from or amplify students' short term recall. Craik and Tulving (1975) found that words processed for their meaning (deep) were more likely to be recalled than words processed for features of the words such as its letters or font (shallow). Additionally, differentiating or disharmonious, into a pre-existing slideshow used for testing the levels of processing effect. It was hypothesized that participants would recall words from the category group more frequently than the rhyme or case groups. Furthermore, participants were expected to remember words from harmonious color palettes more often than disharmonious.

92. **Proprioceptive Drift: The Effect of Visual Perception on Tactile Discomfort**

Jeremy A. , Zachary W. Scott-Grunwald, Jacqueline S. Byrket
Faculty Advisor: Dr. Melisa Fallone, Psychology

Proprioceptive drift is the phenomenon that occurs when an individual perceives sensations through a foreign object as though it is attached to his/her person; the Rubber Hand Experiment is a widely-replicated example of this effect (Lloyd, Gillis, Lewis, Farrell, & Morrison, 2013). The drift phenomenon is an efficient investigative tool for evaluation of prosthetic devices, is essential for the treatment of disorders such as phantom limb pain, and measuring perceived ownership of neural interface controlled prosthetics (Imaizumi, Asai, & Koyama, 2016; Subedi & Grossberg, 2011). The current study replicated the pre-existing Rubber Hand Experiment and integrated the

variable of color/appearance for the rubber hand.

Participants experienced one of two conditions: Blue hand or Caucasian hand. This investigation strove to support the hypothesis that proprioception can be more readily achieved via visually familiar prostheses.

93. **Sensory Acceptability of Protein Fortification of Oatmeal**

Emily Adams, Ethan Jansen, Tolganay Amangeldy, Shuyu Han
Faculty Advisor: Dr. Florence Uruakpa, Biomedical Sciences

Protein-rich foods contribute in combating protein deficiencies in high-risk populations. Prior research found that different types of protein add different flavor and texture to foods, and varying isolation levels for proteins change bioavailability. Oatmeal is high in fiber, and regular consumption leads to higher overall diet quality. The goal of this study was to assess the most effective way to combat protein deficiency through fortification of oatmeal. Sensory evaluation was conducted using a 9-point scale; and compared soy, whey, and egg white proteins to a control group to determine which was most palatable. Percent sag tests were performed on each sample to assess tenderness. It was found that oatmeal fortified with whey protein ranked best ($p=0.05$) in taste, aroma, and enjoyment; the control ranked best in mouthfeel and color. Samples with soy had the highest percent sag (94.2%) while those with egg had the lowest (73.3%). Whey protein sample ranked best in taste (5.94), aroma (6.88), and enjoyment (5.76) while the control ranked best in mouthfeel (7.65) and color (5.06). The results may be used to help prevent protein deficiencies in high-risk populations by enhancing a protein rich food source.

94. **The Acceptability of Jackfruit: A Non-Soy Based Meat Substitute**

Tessa Robinett, Lauren Pavel, Ruchithri Nanayakkara
Faculty Advisor: Dr. Florence Uruakpa, Biomedical Sciences

Using Jack fruit as a meat substitute is a relatively newer concept, thus only few reports on Jack fruit exists. Jack fruit is gaining popularity, as it allows vegetarians as well as meat lovers to find a non-soy based meat alternative. The objectives of this study were to 1) find healthier and more affordable alternatives to meat and 2) assess if panelists could tell them apart. Three different sandwiches (pork tenderloin, Jack fruit in water and Jack fruit in brine) were prepared. Sensory evaluation was conducted using 30 untrained panelists to assess the flavor, texture, and aroma; then identify the samples with meat. Panelists were asked to rank their favorite sandwiches from 1 to 3 with 1 being the

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most favored. Sensory scores for samples with pork, Jack fruit in brine and Jack fruit in water were 1.54, 2.16, and 2.18, respectively. A two tailed T-test analysis showed a significant difference ($p=0.007$) in flavor. Most panelists thought the Jack fruit was a meat product even though the meat product was ultimately favored. In conclusion, the study found that Jack fruit could be a desirable meat substitute for consumers who are looking for a high antioxidant, low fat and low cholesterol meat alternative.

95. Effect of Adding Protein to Pancake Mix: Likeability of Pancakes

Sarah Davis, Sarah Waterman, Kara Wood
Faculty Advisor: Dr. Florence Uruakpa, Biomedical Sciences

Research has shown that the use of whey protein in the diet of an athlete has great benefits. However, there are limited reports on the acceptability of the taste, texture, and appeal per increasing the amount of whey protein in pancake mix. Standard procedures were used to examine the amount of whey protein added to pancake mix that increased nutritional value, but was yet still appealing to athletes in taste, texture, and overall appeal. Sensory evaluation was conducted with 25 untrained panelists (football players). Panelists were provided three different pancakes varying in protein compositions (no added protein, 10g protein, and 20g protein). Panelists ranked likability on a 5-point scale. Sensory scores showed that the pancake with 20g protein was least desirable with a mean score of 2.7. Results showed the pancake with 10g protein was the most desirable with a mean score of 3.7. A T-test analysis ($p=0.05$) showed a significant difference between control pancake and pancake with 10g protein. The study concluded that athletes preferred a higher protein content in pancakes, rather than pancakes with no protein added.

96. Favor the Fat in Chocolate Cake

Katie Wheeler, Rachel Nickles, Cheryl Barnes, Emily Fox
Faculty Advisor: Dr. Florence Uruakpa, Biomedical Sciences

Prior research has shown that fat substitutes in baking have varying degrees on the likability and properties of a product. Focus on health and wellness has gained popularity as individuals are working to improve their dietary intake by lowering the amount of fat or choosing a healthier fat in baking products. The purpose of this study was to determine the effect on moisture, flavor, and acceptability when replacing vegetable oil with avocado puree in a standard chocolate cake recipe at 50% and 100% replacement. Samples of a control cake, one with 50/50 avocado puree and vegetable oil, and one with 100%

avocado puree were used for sensory evaluation. Scorecards were used to rank moisture, flavor, and acceptability of each chocolate cake on a scale of 1-9 (1 being very acceptable and 9 being very unacceptable). Study results showed that 50% avocado puree was well accepted; however, the control ranked highest in each category. Flavor and moisture ranked lowest for chocolate cake with 100% avocado puree as fat. This information may be useful when assessing the acceptability of using healthier fat replacements in baked products.

97. Effects of Different Temperatures in Cooking Brussels Sprouts: A Measure of Acceptability

Jaime Gnau, Meshia Jones, Crosby Keller, Shelby Olson
Faculty Advisor: Dr. Florence Uruakpa, Biomedical Sciences

Cruciferous vegetables have been shown to have health benefits but are under consumed. Brussels sprouts have been found to be one of the most disliked vegetables in the United States. This study was conducted to discover how non-enzymatic browning can increase acceptability of the aroma, taste, and texture of Brussels sprouts and, therefore, increase consumption. For this experiment Brussels Sprouts were prepared in the oven at 3 different cooking temperatures (325°F, 375°F, 425°F). Sensory evaluation was conducted using 25 untrained panelists who rated the taste, aroma, and texture of baked Brussels Sprouts compared to boiled samples as control. Samples were rated using a scale of 1 to 10 with 1 being most disliked. Mean scores for control (375°F) for taste, aroma, and texture are 4.6, 4.52, 4.52 respectively. For 375°F, the scores are 4.6, 4.2, 4.0 respectively, while those for 425°F are 3.07, 3.15, 2.92 respectively. In conclusion, the Brussels Sprouts cooked at 425°F were not well accepted by panelists; and the difference was statistically significant ($p=0.05$). Study results show that baking can be used as a cooking method to improve the overall acceptability of Brussels sprouts by consumers.

98. Effect of Different Types of Flours on Chocolate Chip Cookies

Mariah Cofield, Brittney Gross, Alyssa Laing, Kayley Myers
Faculty Advisor: Dr. Florence Uruakpa, Biomedical Sciences

An increase in gluten intolerance and a desire to decrease refined grain intake has led consumers to look for ingredient substitutes that maintain the overall quality of the original food, because changing ingredients often changes characteristics. This study analyzed the effects of various flours on baking qualities. In each trial, a standard cookie recipe was used, and different flours such as

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all-purpose (AP), whole wheat (WW), and gluten-free (GF) were substituted each time. Twenty-six untrained panelists evaluated all three cookies for moisture, appearance, and flavor. The moisture content was measured using standard oven method and density was calculated. There was significant difference ($p=0.05$) in the mean scores for appearance for all cookies; WW (5.62), GF (5.08), and AP (3.31). Sensory scores for moisture content were significant in GF (3.46) compared to AP (5.15), and WW (4.46) compared to GF (3.46). Since there was no difference in taste of the samples, it would be possible to substitute flours and maintain similar qualities. Using different flours could benefit consumers in making cookies with similar taste for various health and nutritional considerations.

99. Effect of Alternative Sweeteners on the Acceptability of Muffins

Meghan Hagenhoff, Brooke Crotty, Amanda Martin, Natalie Truber
Faculty Advisor: Dr. Florence Uruakpa, Biomedical Sciences

The epidemic of overweight, obesity, and diabetes has caused more people to turn to low calorie sugar alternatives. Previous research is contradictory in whether alternative sweeteners worsen or improve the acceptance of baked products, proving that more research needs to be done on this topic. Muffins were baked using either sugar, sucralose, or stevia. A blind untrained panel of 25 people performed sensory evaluation to assess color, sweetness, aftertaste, texture, and flavor acceptability. Compared to the control muffin (sugar), the muffin containing stevia resulted in the same average score for aftertaste (2.12). Previous research is contradictory in whether alternative sweeteners worsen or improve the acceptance of baked products, proving that more research needs to be done on this topic. Muffins were baked using either sugar, sucralose, or stevia. A blind untrained panel of 25 people performed sensory evaluation to assess color, sweetness, aftertaste, texture, and flavor acceptability. Compared to the control muffin (sugar), the muffin containing stevia resulted in the same average score for aftertaste (2.12). However, the muffin with sucralose resulted in a lower mean score (2.04), indicating a less but insignificant difference ($p=0.81$) in aftertaste. The muffin made with sugar received the best average score (1.64) for flavor acceptability. Muffins made with stevia and sucralose received scores that indicate an insignificant difference ($p=0.82$) between the two. However, compared to muffin with sugar, those with stevia had a significantly ($p=0.03$) lower flavor acceptability. Study results showed that muffins made with alternative sweeteners are well accepted by consumers.

100. Anxiety and Distraction Caused by the Proximity of Cell Phones

William Dooley
Faculty Advisor: Dr. Melissa Fallone, Psychology

Cell phones have been shown to cause distraction from tasks (Stothart, Mitchum, & Yehmert, 2015) and to create anxiety in situations when users are unable to respond to notifications (Sapacz, Rockman, & Clark, 2016). The purpose of this study was to examine how variations in cell phone proximity affected anxiety levels and distraction from tasks. While completing a sustained attention task (SAT), participants received notifications on their cell phones that were 1) on the desk, 2) in the room but put away in the participant's backpack, 3) out of the room, or 4) the location of the cell phone was not specified. Anxiety was measured with a state anxiety self-inventory given before and after the SAT. Distraction was measured by reaction time, errors of omission, and errors of commission on the SAT. Results did not support our hypotheses. Neither anxiety nor distraction were affected by the proximity of the participant cell phones.

101. Respecting Our Past; Charting Our Future: A Visual Ethnography Qualitative Study

Leah Reitmayer, Jaime Gnau, Ashley Amos, Rachel Nickles, Aubrey Snedeker, Alix Opfer, Kayleen Turnbull, Sabrina Storms, Austin Winter
Faculty Advisor: Dr. Anne Marie Hunter, Biomedical Sciences

Objective: The purpose of this study was to reflect on the culture and history of the profession of dietetics in a visual format celebrating the 100th anniversary of the Academy of Nutrition and Dietetics (AND), formerly the American Dietetic Association (ADA). Methods: Qualitative methodology of ethnography using images was conducted. Five hundred pictures were gathered in historical context showing important events within the profession over the century. Music was selected to enrich the visual layout and enhance the effect of the video on the viewing audience. Drafts of the video were reviewed by production faculty in the Media, Journalism and Film Department of Missouri State University. Results: Images and music were formatted into the final video production. Conclusion and Significance: This video captures the lived culture and history of the Academy of Nutrition and Dietetics and the maturation of the profession. Educators and practitioners can utilize the video as an experiential approach to inspire students and professionals to push boundaries; make strides toward a healthier tomorrow; and embrace the potential and possibilities of the second century.

102. CHHS Investigating the Role of P2Y₂R In Leukocyte-Endothelial Interaction and Microvascular Hemodynamics *in VIVO*

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The role of purine nucleotides (ATP and UTP) as extracellular signaling molecules in modulating vascular inflammation and endothelial junctions has been established. Preliminary evidence suggests purinergic signaling, mediated largely in part by P2Y₂ receptors (P2Y₂R), is associated with vascular endothelial hyperpermeability and upregulation of leukocyte-endothelial interaction. Intriguingly, studies on the precise pro- and anti-inflammatory role of P2Y₂R are paradoxical. The aim of this current study was to investigate the role of P2Y₂R on local microvasculature and leukocyte-endothelial hemodynamics *in VIVO*, utilizing epifluorescent intravital microscopy. Minimally invasive surgical exteriorization of the cremaster muscle was performed on P2Y₂R and C57BL/6 mice and microcirculation was visualized under bright field and fluorescent IVM. Changes in hemodynamics and leukocyte-endothelial interaction were analyzed under basal and UTP challenged conditions by time-lapse video photography recorded at various time points, using a semi-automatic tracking methodology. These findings will ultimately further determine the role of P2Y₂R in altering local hemodynamics as well as the overall importance of P2Y₂R in promoting inflammation.