



Welcome to the 2024 Celebration of Scholarship and the 22nd Undergraduate Research and Creative Activity Forum. This event features research and creative activity presentations by MSU Texas faculty, graduate students (including the Graduate Three Minute Thesis™ Competition), undergraduate students, and Fain Elementary students.

The following abstracts represent hard work and dedication to research and creative work by faculty and graduate students. The program has been organized by presentation type and time.

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Faculty and Graduate Presentation Abstracts

Oral Presentations

Cheyenne Meeting Room

12:00 – 12:50 PM

Application of Fluorescence-Based Spectrophotometry in Graduate and Undergraduate Student Research

James Masuoka, Faculty, Biology

Quantification of protein and nucleic acid (DNA, RNA) is an important component of biological research. Processes downstream of cell extraction such as whole genome sequencing and proteomic analysis are both time- and supply-intensive. Thus, knowing that an adequate amount of material is present is critical to avoid wasting time and resources. Advances in detection instrumentation have significantly decreased the amount of sample required as well as the time needed to prepare samples and make measurements. A fluorescence-based micro-volume spectrophotometer (Qubit) utilizes reagents that allow distinguishing DNA, RNA and protein from each other, even in mixtures. Thus far, we have used the Qubit to determine DNA concentrations in bacterial extracts for whole genome sequencing and in leaf extracts for determining fungal species diversity. Future applications include measuring DNA concentrations in bacterial extracts for speciation and soil samples for bacterial and fungal species diversity.

Cheyenne Meeting Room

12:00 – 12:50 PM

An Assessment of the Effects of Microfinance and Remittances on Poverty in Developing Countries

Pablo A. Garcia-Fuentes, Faculty, Letreanna Jackson, Faculty, Yaman Joshi, Graduate Student, MBA Business Analytics

The United Nations sustainable development goal number 1 is “End poverty in all its forms everywhere” (United Nations, 2024). It is expected that about 575 million people will face extreme poverty by 2030 (United Nations, 2024). Reducing poverty has been a focus of international organizations and developing country governments. The current research focuses on the analysis of the effects of microfinance and remittances on reducing poverty. It uses a sample of 97 developing countries for the period 1990-2020. It conducts robust OLS estimations. It finds that microfinance reduces poverty when remittances are not added to the OLS regression model. However, when remittances are included in the model, microfinance does not have a significant reducing effect on poverty even remittances do.

Cheyenne Meeting Room

12:00 – 12:50 PM

Shopping Therapy: Is It Real or Not for Lonely Consumers?

Eunyoung Jang, Faculty, Marketing

Today's consumers are lonelier than ever. Previous research finds that lonely consumers often use consumption to attain some levels of connectedness, but it is unclear whether the purchase contributes to their happiness. The current research investigates how purchases (i.e., experiential vs. material purchases) contribute to the happiness of lonely consumers. Five experiments were conducted to explore whether and why different purchase types influence lonely people's happiness (IRB No. 22110801). Studies 1A and 1B seek to provide initial evidence of how lonely (vs. non-lonely) people feel happiness from experiential purchases. Study 2 explores an underlying mechanism and Study 3 provides a boundary condition of social condition. Finally, study 4 shows the effects of manipulated and measured loneliness. The results show that purchases do not enhance lonely consumers' happiness. Especially as people feel lonelier, experiential purchases have more harmful effects on their happiness, and the low happiness is driven by the low psychological ownership over experiential purchases. This finding contradicts the conventional wisdom known as an experiential advantage, suggesting that experiential purchase brings greater happiness than material purchase. Implications for theory and practice are discussed.

Kiowa Meeting Room

12:00 – 12:50 PM

Deep in the Dark Heart of Texas: Reflections on Dark Tourism in the Lone Star State

Jennifer Dawes, Faculty, English, Humanities, and Philosophy

My project explores sites of dark tourism in Texas. Dark tourism is travel to sites of death and suffering for recreational or educational purposes. In this presentation, I will contrast the memorialization of Texas independence at sites like Goliad and Gonzalez with the Branch Davidian massacre site outside of Waco.

Some questions I consider in my project include: How have historical events shaped the narrative about places in Texas? How have the places shaped the narratives about the historical events? How is the dark subject talked about (or not) in the place? What sites are available for public understanding and/or interaction with the story? How do the inhabitants of the place feel about what happened there? What motivates a tourist to seek out these places? What is the tourists' response to viewing the site(s) associated with a dark event?

My hypothesis is that in cases where a dark event can be promoted for tourism (ghost tours, crime tours, disaster tours), a community may choose to capitalize on the connection. In places

where it is impossible to shape what happened into an entertaining tourist experience (concentration camps for instance), a community might use education as a rationale for sharing the event or it may attempt to dismiss, distract from, or even conceal the connection between place and history (as I found in Waco).

Kiowa Meeting Room

12:00 – 12:50 PM

Mothers, Daughters, and Barbie the Movie: The Contradictions of Being a Woman

Melissa Nivens, Faculty, English

Without doubt, Greta Gerwig's *Barbie the Movie* is EVERYWHERE. In the summer of 2023, women and girls filled theaters to watch a film that some claimed was just about "a plastic doll with big boobs" (Jo Koy). Instead, viewers came away with a with a larger message that has sparked much conversation and criticism in the public sphere. Almost a dozen articles have appeared in *The Atlantic* alone about the film. In her recent *Huffington Post* article, Emily McCombs claims Ruth Handler's line: We mothers stand still so that our daughters can look back and see how far they have come, "seems at odds with the rest of the film" and makes her "absolutely furious" (McCombs). This presentation responds to some of this public criticism and explores the often contradictory rules of what it means to be a woman and mother today. Further, this talk uses the theoretical framework of Lindal Buchanan's *Rhetoric's of Motherhood* and questions her claim that "Woman is the anthesis of Mother – the dark to its light" (8). Must a mother "stand still" and lose her identity as a woman once she has children? How do mothers do the work of helping their daughters navigate the frustration of contradictory messages? Finally, this presentation considers how the performance of femininity and domestic tasks on social media has created a subculture of trad-wives which seems to blur the binary lines of woman/mother.

Cheyenne Meeting Room

1:00 – 1:50PM

An Assessment of the Effects of Remittances on Healthcare Expenses in Developing Countries

Pablo A. Garcia-Fuentes, Faculty, Letreanna Jackson, Faculty, Phyo Wai Yan Win Swe, Graduate Student, MBA Business Analytics

The United Nations sustainable development goal number 3 is "Ensure healthy lives and promote well-being for all at all ages" (United Nations, 2024). In 2021, 25 million children missed out on important immunizations, and malaria cases increased to 247 million in 2021 from 245 million in 2020 (United Nations, 2024). Reducing the negative effects of diseases and promoting better health has been a focus of international organizations and developing country governments. The current research focuses on estimating a long-run causal relationship between per capita international remittances and health care expenditures in developing

countries. It uses a large sample of developing countries for the period 2000-2020. It aims to estimate the remittances of elasticity of health expenditure as well as the income elasticity of health expenditure for developing countries. The data analysis includes panel unit root tests, panel cointegration tests, and long-run relationship estimations. We expect that remittances contribute to health expenditures, which is related to improving health in developing countries.

Cheyenne Meeting Room

1:00 – 1:50PM

An Assessment of the Relationship between Remittances and Food Security in Developing Countries

Pablo A. Garcia-Fuentes, Faculty, Megan Widner, Graduate Student, Economics

The United Nations sustainable development goal number 2 is “End hunger, achieve food security and improved nutrition and promote sustainable agriculture” (United Nations, 2024). It is expected that more than 600 million people will face hunger in 2030 (United Nations, 2024). Eliminating hunger and promoting food security is an important focus of international organizations and governments. To reduce hunger, it is important to put all available resources to work. International remittances are an important source of money for households in developing countries. Remittances can contribute to increasing household expenditures on education, health, and food. Thus, it is important to study the relationship between remittances and food security in developing countries. This is the focus of the current research. It uses a sample of 81 developing countries for the period 1990-2020. It uses the global food security index published by The Economist. The index comprises four pillars: economic resilience, production and agricultural resilience, nutritional resilience, and environmental resilience (The Economist, 2022). We conduct Panel Generalized Methods of Moments Instrumental Variable estimations to estimate the effects of remittances on food security. The results suggest that remittances increase food security in developing countries. The results have policy implications regarding hunger reduction and promoting food security.

Kiowa Meeting Room

1:00 – 1:50 PM

And they ‘usurped insensibly all authority’: The Hospital Sisters from 1300-1365

Tiffany A. Ziegler, Faculty, History

According to nineteenth-century historians Alexandre Henne and Alphonse Wauters, the sisters of Saint John hospital in Brussels, Belgium had by mid-fourteenth century “usurped insensibly all authority.” Further, Henne and Wauters postulated that the women’s behavior resulted in a 3 March 1365 ordonnance by the aldermen and the town council to revise “the primitive discipline of the community, which had been quite relaxed.” Although the city did step in to

revise the rules that the sisters lived under (giving them payment in coin instead of grain, for example), the question of 'women behaving badly' needs to be better understood within the late medieval context. The new rules were not punitive; rather, they reflected greater social, political, and religious trends, including a movement to regulate hospitals on a continental level and by lay, rather than religious, groups.

This paper explores the period from c. 1300 to 1500 from the viewpoint of the hospital sisters; it includes an analysis of the 1365 ordonnance. The paper draws from chapter three of an OSPR-sponsored project on *The Hospital Sisters*.

Kiowa Meeting Room

1:00 – 1:50 PM

Dark of the Moon: The Life of American Playwright William Berney

Whitney Snow, Faculty, History

William Berney garnered accolades for *Dark of the Moon*, his first drama play, when it was written. Though he wrote other plays, adapted novels for the stage, and penned television screenplays, he achieved no greater success than this daring folk tale. In more modern times, the same play--which incorporated rural idealism, duplicity, dialect, ill-fated lovers, and tragedy--has received criticism for its emphasis on southern stereotypes, reproaches of religious faith, and violence against women. Now considered scandalous and offensive to most modern standards, the play has transitioned from a popular dramatic endeavor, one even used by high school and college theater departments, into a literary work that is largely shelved, though it continues to be staged on occasion.

Kiowa Meeting Room

1:00 – 1:50 PM

The Origin of Medical Astrology

Brynna Ogle, Graduate Student, History

There exists a long and winding history between advancements we would now consider scientific and the spirit of the people who used them and brought them into fruition. One such example is the relationship between Ayurveda, a traditional system of medicine in India, and Vedic Astrology, or Jyotish in the language of their traditional thought. Both of these concepts are popularly dated by many indigenous Indian scholars all the way back to the fifth century BCE, though there also exists some debate on the subject of the date of the information.

The creation of Astrology cannot be empirically attributed to just one civilization, but certain aspects of the consolidated system that has developed can be traced back to different cultures. Ideas about Astrology, considered synonymous with astronomy at this time, amalgamated

among ancient societies under Hellenistic rule with the exchange of information in Alexandria. It is from this scholastic exchange that we see Astrology and its many facets begin to be used inter culturally and even medicinally, the latter of which this analysis aims to establish as one of India's contributions to the development of Tropical (non-Vedic) Astrology in the West.

Cheyenne Meeting Room

2:00 – 2:50 PM

Teaching Cultural Awareness in the Simulation Lab

Sandra Groth, Faculty, Nursing

Background: Nursing students must develop a sense of cultural awareness to meet the healthcare needs of the diverse population. Simulation is a pedagogy that promotes cultural awareness by providing a safe learning environment that allows students to practice engaging in topics related to diversity that cannot always be planned in a clinical setting; for example, situations that highlight differences in bruising on darker skin. Through the learning experiences, students can recognize their biases to provide individualized and culturally relevant care in clinical practice.

Purpose: Enhance cultural awareness in baccalaureate degree nursing students through a simulation experience.

Methodology: Quasi-experimental study using senior-level nursing students. The students completed a cultural awareness scale and a self-directed pre-simulation assignment. The students then participated in a simulation involving a case of suspected child abuse using a dark-skinned 18-month-old mannequin. The simulation lasted two hours, followed by a one-hour debriefing and reflection exercise. Following the simulation, the students repeated the cultural awareness scale. The IRB approval number is 22120501.

Findings: There were 37 participants with 26 meeting the inclusion. The paired t-test showed no significant difference in cultural awareness pre- versus post-simulation ($t = -10.77$, $p = 2.03$). However, during debriefing, students reported the importance of doing good skin assessments and recognizing differences in the bruising of various skin tones.

Conclusion: Simulation is effective for addressing skills relevant to improving cultural awareness. In conclusion, providing realistic cultural awareness training in simulation allows learners to practice skills in a safe environment.

Cheyenne Meeting Room

2:00 – 2:50 PM

Cumulative Complexity: Explicating the Structure of Argumentation

Morgan Ballesteros, Graduate Student, Psychology

We propose a new model of cognitive complexity, Cumulative Complexity (CC), that is meant to serve instructors in identifying and teaching nuance. Developed from Integrative Complexity (IC; e.g., Suedfeld et al., 1992) and the Argument Complexity Scale (ACS; Kelly & West, 2017), this new model would solve various problems inherent to current systems (e.g., the omission of the overarching structure of argumentation) while adding theoretical and pedagogical depth. Undergraduate students at Midwestern State University have traditionally been required to take a Writing Proficiency Exam (WPE) prior to graduation. Using the Michigan Corpus of Upper-Level Student Papers, we will randomly select 109 essays and score them on the WPE rubric, IC, ACS, and CC. WPE scores will be correlated with complexity model scores, and each complexity score will then be correlated with the other two complexity measures' scores. These correlations will allow an examination of the relationship between complexity scores and what the University explicitly seeks in undergraduate writing. Additionally, we will assess the degree of overlap between each measure of complexity. Overall, we anticipate that each complexity measure will have a positive relationship with WPE scores. Next, we anticipate that complexity measures will not differ significantly in their relationship with the WPE rubric, as each measure contains much theoretical overlap. However, because we anticipate that CC will allow for greater variability and nuance in scoring, it should allow for more pedagogical utility. Thus, CC would be the preferred argumentative complexity model in classrooms.

Cheyenne Meeting Room

2:00 – 2:50 PM

Minding the Source: Does Trait-Mindfulness Influence the Accuracy of Source Monitoring Judgments?

Nicholas P. Maxwell, Faculty, Psychology

Source-monitoring, or the ability to accurately attend to an object's location, is critical for memory. Judgments of Source (JOSs) can be used to investigate source monitoring accuracy. In these tasks, participants study object-location pairs and predict their ability to remember an object's paired location on a later memory test. However, previous research has revealed a dissociation between JOSs and memory: Participants provide high JOSs for expected item-location pairs (e.g., MICROWAVE-KITCHEN), but at test, memory is greater for unexpected pairs (e.g., MICROWAVE-BATHROOM). Thus, there is a disconnect between predicted source memory (assessed via JOSs) and actual source memory. Because trait-mindfulness is linked to enhanced source-monitoring processes (e.g., Konjedi & Maleeh, 2020), the present study tested whether trait-mindfulness can moderate JOS accuracy. Participants studied a list of expected (e.g., Microwave-Kitchen) and unexpected (e.g., Toilet-Kitchen) object-location pairs and made JOSs for each item. They then completed a source-monitoring test which required them to report the location of each previously studied item. Finally, participants completed two measures assessing trait mindfulness: The FFMQ-15 (Baer et al., 2008) and MAAS (Brown & Ryan, 2009). Overall, findings were in-line with previous research, as JOSs overestimated memory for

expected object-location pairs but underestimated memory for unexpected pairs. However, comparing between high and low mindfulness individuals yielded no differences in source-monitoring accuracy as a function of trait-mindfulness, suggesting that trait-mindfulness has little impact on source-monitoring accuracy. This study was approved by the MSU Texas IRB, Approval #22101701.

Creative Activity Oral/Forum

Kiowa Meeting Room

2:00 – 2:50 PM

Motion Capture Performance for Figure Drawing

Jason Bly, Faculty, Art

The research involves using motion capture suit technology to record the movements of performances for in use in drawing art practice. Though I work with traditional materials (drawing and painting), I am interested in how technology can inform choices made within the work: understanding anatomy, movement, balance, new viewpoints, and simplification of complex forms.

As an evolution of the relationship between photography/film and traditional figure drawing, the motion capture tech allows the artist to visualize the model's pose from a variety of camera angles in a virtual space. Additionally, the technology aids in understanding the movement dynamics presented by the performer: replay, slow-motion, reverse, etc. By combining with a 3d simplified form, the basic building blocks of the model, pose, and movement, are revealed for review and reconstruction in traditional 2d media. Furthermore, the recorded movements can be allowed to fantastic and non-humanoid models to visualize the artist's use. In this way, the technology challenges long held aesthetics found in figurative work.

For this research, I have acted as both artist and performer in the motion capture suit. The recordings in the suit are saved as generic non-identifying 3d models, though based on my measurements. The timeline of the work began in September 2023: learning motion capture software, learning 3d sculpture and animation, alignment, and structure of forms, and combining all with my pre-existing knowledge of anatomical drawing practice. The presentation of materials will be a combination of slideshow, animated sequences, and images of in-process work and finished work.

Kiowa Meeting Room

2:00 – 2:50 PM

Premiering *A.L.I.C.E.; An Operatic Wonderland*

Darla Diltz, Faculty, Music

Grace Edgar, Faculty, Theatre

As a composer, Amy Scurria is determined to break the paradigm within the genre of opera to replace the "tragic female" with strong female leads that are central figures in theatrical productions. After meeting in 2022 at the National Women's Theatre Festival, Amy joined Grace Edgar and Darla Diltz to create a majority female production and creative team for the world premiere of their opera *A.L.I.C.E.; An Operatic Wonderland* at Red River Lyric Opera in July 2023. This session will address the importance of creating opportunities for "other(ed)" voices. Positioning women in the roles of composer, producer, conductor, and director breaks through the "glass ceiling" and "maternal wall" of opera to reveal intuitive, truthful, and dynamic storytelling.

Poster Presentations

Comanche Meeting Room

12:00 – 1:00 PM

Evidence for Aerobic Metabolism by Escherichia Coli Grown within a Synthetic Mucus Layer

Merina Guiste, Graduate Student, Biology

Escherichia coli is one of many bacterial constituents of the human gut microbiome. Although pathogenic strains of *E. coli* can cause gastrointestinal disease, microbiome *E. coli* strains aid in digestion, produce needed vitamins, and prevent pathogen attachment. These non-pathogenic, colonizing strains can cause disease if they are able to enter other body compartments, such as the lung. In the gut, *E. coli* metabolism is anaerobic as this environment is oxygen-depleted. In the lung, we would expect metabolism to be aerobic due to the presence of atmospheric oxygen. Aerobic metabolism would result in higher energy production – leading to increased growth rates – as compared to anaerobic metabolism. However, the lung surface is coated with mucus and this viscous material might limit oxygen availability. We hypothesized that, despite this, *E. coli* would shift to aerobic metabolism even when grown in the presence of this mucus. To test this, *E. coli* strains were grown on solid media in the presence and absence of a synthetic mucus. Our results demonstrated that cell growth in the presence of mucus was relatively unchanged from that without the mucus layer. This similarity suggests that growth within our mucus layer is not anaerobic and that the bacteria are able to use oxygen for their metabolism. Further characterizing growth in this mucus model system will increase our understanding of *E. coli* pathogenesis in cases of bacterial pneumonia.

Effect of Hydric Stress on Eastern Red Cedar Leaf Fungal Endophyte Diversity

Anastasia Guseva, Graduate Student, Biology

Native trees have an advantage over foreign plants due to the presence of microbes, including bacteria and fungi, residing within both the soil and plant tissue, the latter known as

endophytes. Endophytes improve plant host fitness by synthesizing phytohormones and secondary metabolites, nutrient absorption, and providing protection against plant pathogens. Plant fitness, the ability to thrive in an environment, is affected by biotic stressors, such as plant pathogens, and by abiotic stressors, such as drought. While the interaction between soil symbionts and their host plants during times of drought has been investigated, the impact of drought on plant endophytes is largely unknown.

We hypothesized that *Juniperus virginiana* trees with dependable access to a body of water would have a more diverse population of endophytes as compared to the trees that do not. To test this hypothesis, we obtained leaf and soil samples from trees at four sites across the state in soils classified as wet or dry. DNA was extracted from leaf tissue followed by amplification of a conserved DNA region by PCR. Fungal sequences of this region were used to identify fungal type and abundance. Additionally, fungal isolates grown from leaf tissue were cultured for morphologic identification. Results demonstrated that the majority of fungi comprised ascomycete species. Fungal populations from the trees sampled in Ellis and Madison Counties were similar. However, those from trees sampled in Wichita Falls differed. Further analysis and sampling will provide insights into how endophyte populations correlate with and are affected by soil moisture conditions.

Investigating the Mechanisms of *Candida Albicans* Survival in the Presence of the Human Gut Bacterium *Escherichia Coli*

Tenzin Tashi Shakya, Graduate Student, Biology

Numerous microbial species colonize the gastrointestinal tract, such as bacteria, archaea, viruses, and fungi. Collectively, this population of microbes is the gut microbiome. The presence of fungi, such as *Candida albicans*, in the gut microbiome is demonstrated by the ability to culture this organism from fecal samples. However, the growth rate of bacteria in culture is much greater than that of fungi. Thus, we might expect bacteria to outcompete fungi in this environment.

We hypothesized that fungi in the gut microbiome enter a state of dormancy, removing the competition for nutrients. To test this hypothesis, we cultured *C. albicans* strains in the presence and absence of *E. coli*, a common bacterial component of the human gut microbiome. We compared cell concentrations after 24 hours of growth. Viability of the fungal cells was determined through the use of a Live/Dead stain. Finally, we assayed for the production of glycogen, which indicates storage of energy rather than an active metabolism. Our results suggest that co-culturing *C. albicans* with *E. coli* did not affect fungal cell growth, indicating they are not entering dormancy under these conditions. Future work will more directly assay metabolic respiration and test relative growth under conditions that more precisely reflect those seen in the gut. The gut microbiome has been shown to influence host physiology and behavior. Understanding how the various organisms in the gut microbiome interact with each other will further our understanding of these host-microbe interactions and their role in host health.

Comanche Meeting Room

1:00 – 2:00 PM

Interlimb Asymmetry Magnitudes in Men's and Women's Soccer Players

Gavin Scott, Graduate Student, Athletic Training and Exercise Physiology

Differences in the performance and function of one limb with respect to another is known as interlimb asymmetry and is common in soccer due to its distinct characteristics. Purpose: The purpose of this study is to determine the magnitude of interlimb asymmetry between NCAA Division II men's and women's soccer players. Methods: Thirty participants (n =30) fifteen male (n =15) and fifteen female (n =15) completed a testing protocol where concentric knee extensor and flexor peak torque was measured. Three contractions for five seconds was completed by each participant for each action on the right and left leg. Results: While not statistically significant, asymmetries were observed in each gender for the quadricep and hamstring muscle groups. Male Asymmetry: Quadricep $10.62 \pm 8.89\%$, Hamstring $13.33 \pm 8.43\%$. Female Asymmetry: Quadricep $7.70 \pm 7.63\%$ Hamstring $8.56 \pm 6.04\%$. Utilizing a one-way ANOVA to identify potential differences in quadricep and hamstring interlimb asymmetry between genders. No statistically significant differences were observed: Quadricep (p = 0.34) Hamstring (p= 0.08). In regard to intralimb asymmetry, no statistically differences were observed in H:Q ratio in the right leg (p = 0.485) and left leg (p = 0.195). Hamstring interlimb asymmetry approaching significance may be due to females performing hamstring strengthening ACL prevention exercises more often than men. Conclusion: Research findings show there does not appear to be a need to for drastically different programming of soccer, injury prevention, and strength & conditioning sessions based off gender outside previously mentioned hamstring strengthening in females. IRB 24022401

Biomechanical Assessment of Footwear and Foot Landing Types in Collegiate Female Runners at Preferred Running Speed

Shivaniba Gohil, Graduate Student, Athletic Training & Exercise Physiology

PURPOSE: To investigate the impact of two footwear and two foot landing type conditions on lower limb and lumbar acceleration and kinematics. METHODS: Six collegiate female runners ran on a motorized treadmill preferred speed during two shod conditions, barefoot (BF) and shod (SH), and two foot landing conditions, heel strike (HS) and forefoot (FF). Inertial measuring units (triaxial accelerometers and gyroscopes) were secured on the foot/shoe, tibia, lateral thigh and lumbar region on the right side of the body. Vertical acceleration data from the lumbar IMU was integrated to velocity, which was used to determine foot contact. Variables of interest were: maximum acceleration at foot contact (FTA), timing of maximal foot acceleration (FTAt), maximum acceleration at the lumbar region (LA), timing of maximal acceleration at the lumbar region (LAt), greatest negative angular velocity of the lumbar region at foot landing (Lgy), and timing of the greatest negative angular velocity at foot landing (Lgyt). RESULTS: A

significant foot landing x shod condition interaction effect was present for FTA ($p < 0.05$). A significant main effect of shoe for FTAt ($p < 0.01$) and landing for the Lgy ($p < 0.03$) were present. A significant landing x shoe interaction effect was present for the Lgyt ($p < 0.01$). CONCLUSION: The combination of foot landing style and SH/BF indicated modified shock attenuation at foot landing while running at preferred speed. The timing of the shock was dependent upon whether running in shoes or barefoot, where the shoe extends the timing of the shock.

Evaluation of an Eccentric Training Protocol to Rehabilitate Hamstring Muscles in Male Soccer Players

Patrick Fitzgerald, Graduate Student, Athletic Training & Exercise Physiology

PURPOSE: The purpose of this study is to evaluate the efficacy of an eccentric training protocol using NHC to rehabilitate hamstring muscles in male soccer players.

METHODS: The study was a randomized controlled trial that included eight male soccer players with and without a history of hamstring injury. Participants received treatment (NHC) for six weeks, with two sessions per week. The evaluation measures included isokinetic (concentric and eccentric) muscle strength tests of both legs, quadriceps and hamstring muscles using an isokinetic dynamometer. The torque measurements were taken at baseline and after six weeks of treatment. The data were analyzed using an ANOVA to evaluate the main effects of time (pre-post tests), muscle group, action (concentric-eccentric), side (leg), and their interactions. RESULTS: The results showed significant improvements in muscle strength. A significant increase in isokinetic peak torque (pre to post test $p < 0.05$, and action*muscle group interaction $p < 0.05$) and average torque (pre to post test $p < 0.01$, action $p < 0.05$, muscle group $p < 0.01$, and side $p < 0.05$).

DISCUSSION: The protocol resulted in significant improvements in muscle strength, muscle endurance, and functional performance tests compared to the standard rehabilitation protocol and supported the previous research of Malone (2018). Therefore, it is recommended that this protocol be incorporated into the rehabilitation program for hamstring injuries in male soccer players.

Quantifying the Chronic Thermoregulatory Adaptations in Hot Repair Work Team Members at Vitro Architectural Glass

Breanna Leary, Graduate Student, Exercise Physiology

Due to the demands of their job, members of the hot repair team at Vitro Architectural glass are exposed to high (140 to 160°F) ambient temperatures and physically demanding work which have resulted in heat related illnesses (HRI) in the past.

PURPOSE: The purpose of this study was to gain an understanding into the physiological response within members of the hot repair team at Vitro Architectural Glass. **METHODS:** Four male members (age= 34.3 ± 4.8 yrs., height = 176.2 ± 3.6 cm, weight = 95.5 ± 12.9 kg, BMI = 30.4 ± 2.9 kg/m²) of the hot repair team took part in this observational study. Core body temperature and heart rate were recorded over a single 8-hour work shift. Upon completion of their work shift, all members completed a sweat analysis test.

RESULTS: Throughout the course of their 8-hour work shift, hot repair team members were exposed to temperatures ranging from 140-160° F for 3.36 ± 0.3 hours, which resulted in an average heart rate of 121 ± 6.9 b/min. during active work. Despite the harsh working conditions core body temperature only saw an increase from 98.6° ± 0.2° F to 100.6° ± 0.3°.

CONCLUSION: Members of the hot repair team are well acclimated to heat stress evident through their ability to maintain safe core body temperatures throughout their shift. Given this information, proper hydration and electrolyte replacement may be the primary mechanism to reduce the likelihood of HRI occurrence. IRB Approval # 23071702

The Effects of Blue Light Exposure on Measures of Lower-Body Strength and Power

Noah Reinertz, Graduate Student, Exercise Physiology and Athletic Training

Recently blue light exposure at night has received negative attention due to its ability to interrupt the sleep-wake cycle through reducing melatonin production and increasing alertness. However, when individuals are exposed to blue light in the morning a number of positive benefits have been observed such as; decreases in depressive symptoms, increases in cognitive function, decreases in reaction time, and increases in alertness. The purpose of this study was to determine if blue light exposure in the early morning was capable of increasing measures of lower-body strength and power. **METHODS:** A repeated measures crossover design was used to determine differences in performance. Nineteen participants completed all data collection. Nine male (age = 20.3 ± 0.8 yrs., height = 174 ± 2.2 cm, weight = 71.6 ± 5.7 kg) and ten female (age = 21.4 ± 0.5 yrs., height = 166.2 ± 2.3 cm, weight = 69.5 ± 5.6 kg) participants completed 2 trials with a minimum of 72 hours between each trial. Participants arrived to the laboratory between 0600 and 0900 within 30 minutes of waking for each trial. For each trial, participants completed a 30-minute warmup period consisting of 15 minutes of passive rest and 15 minutes of cycling. The treatment trial received blue light exposure during the entirety (30 minutes) of the warmup while the control trial was exposed to minimal florescent lighting. Blue light exposure was in the form of glasses that emit 100 lux at approximately 468 nm wavelength of blue light. Following the warmup, researchers measured dynamic knee extensor torque (10 repetitions of isokinetic knee extension and flexion at 180 and 300° / sec) and peak isometric knee extensor strength with an isokinetic dynamometer (Biodex Medical Systems Inc. Shirley, NY). Countermovement vertical jump (Jump USA Vertec, Sunnyvale CA) was also measured following the completion of dynamometer testing with participants completing 3 maximal efforts with 1 minute of rest between each. A repeated measures MANOVA was conducted to

analyze lower-body performance measures. RESULTS: While blue light exposure resulted in increases in performance for each measured variable (peak torque 180°/sec - 100.8 ± 8.3 vs. 94.4 ± 8.6 N*m; peak torque 300°/sec - 82.2 ± 6.7 vs 76.2 ± 7.4 N*m; vertical jump 50.89 ± 2.46 vs. 48.12 ± 2.4 cm), no significant ($p > 0.05$) differences were observed between the blue light trial and the control trial. CONCLUSION: Recent research has hypothesized a potential benefit of blue light exposure with regard to performance finding mixed results. Although increases in performance were found, results from this study were unable to find significant increases in lower body strength and power. Future research may focus on individuals who habitually exercise in the early morning, or athletes who are accustomed to performing under less than ideal circumstances.

Comanche Meeting Room
2:00 – 3:00 PM

Decision to Bomb Laos

P. Mike Rattanasengchanh, Faculty, History

Much of the research on the U.S. bombing of Laos focuses on statistics and awareness of unexploded ordinances, but not on examining the history of relations between Lyndon B. Johnson's administration and Souvanna Phouma's government and their decision-making process. The United States had a strong interest in stymieing communism in the country, especially as Souvanna sought for neutrality. Eventually, Laos gained neutrality in 1962, forming a tri-partite government but peace was short-lived. The coalition government was weak and relations between factions deteriorated quickly at about the same time U.S. intervention increased in the region, including Laos. By analyzing U.S. government documents from Johnson's Presidential Library and various Lao and French language newspapers, we learn more about the evolution of Souvanna's acceptance of U.S. demands for bombing Laos. Souvanna was reluctant about increasing U.S. military intervention as he wanted to salvage neutrality and the coalition. I argue that with each skirmish between right and left-wing Lao groups in 1964-1965, Souvanna tried to balance U.S. demands for bombing the country and peace talks – fighting while negotiating, and would continue up until the 1970s. This paper will discuss the origins and decision-making process of one of the most devastating bombings in world history. Washington worked closely with Souvanna's government to coordinate the timing and location of bombing missions and their rationale for doing so. Debates between both governments show the internal struggles Souvanna had with the decision to bomb Laos and the pressures Johnson put on the Lao leaders.

Peer Review of Radiologist Assistants: Current Practices and Perceptions

Vicki L. Dillard, Faculty, Radiologic Sciences

Background: Providers and healthcare organizations use peer review to identify practice variations; optimum or substandard care delivery; effective or ineffective communication; and

deficiencies in professionalism by comparing the peers' views on performance against accepted standards. In radiology, diagnostic and interventional radiologists routinely perform peer review, but no information exists on processes for radiology-specific advanced practice providers, particularly radiologist assistants. This quantitative descriptive study aims to explore the perceptions and current practices of radiologist assistants' peer-review process.

Methods: A 49-question anonymous online questionnaire was emailed to 133 radiologist assistants in the American Registry of Radiologic Technologists database. Descriptive statistics were used for data analyses.

Results: The response rate was 42.1% (56/133). Most respondents (62.5%) participated in peer review. Direct in-person observation (21.4%) was the most common process used for radiologist assistants. Radiologists (62.5%) and radiologist assistants (51.8%) were considered peers to perform peer review. Although respondents indicated individual feedback was given by letters or emails (16.1%), they preferred face-to-face or phone call discussions (39.3%). Most respondents (65.5%) did not have peer review meetings for educational purposes. Overall, most respondents agreed (92.5%) that participating in peer review would be beneficial to their professional and educational development (90%), and that learning from peer review would be worth their time (95%).

Conclusion: Radiologist assistants were receptive to participating in PR and saw it as beneficial for educational and professional development. Knowledge of current processes and perceptions allows the development of radiologist assistant-specific peer review. IRB Approval Number- Exempt Protocol #2023-058

Graduate Three-Minute Thesis™ Competition

Enhancing Accountants' Productivity: Impact of Deploying Automation Bots

Anas Shakeel, Graduate Student, Business Analytics

My paper examines how robotic process automation can help accountants work efficiently, especially during busy times like tax season. We want to see if these bots can make accountants' lives easier and help them do their jobs faster. After working with accountants and looking at data to see how things changed after using automation. Using bots reduced accountants' time on boring tasks like entering data and filing taxes. This meant they had more time to do important things like helping clients with tax advice. We also learned that automation bots are different from AI. Bots follow rules and do tasks they are programmed for, while AI can think and make decisions. My study shows that bots can make accountants happier and improve client relationships. It also helps businesses run better overall.

An Assessment of the Effects of Microfinance and Remittances on Poverty in Developing Countries

Yaman Joshi, Graduate Student, Business Analytics

The United Nations sustainable development goal number 1 is “End poverty in all its forms everywhere” (United Nations, 2024). It is expected that about 575 million people will face extreme poverty by 2030 (United Nations, 2024). Reducing poverty has been a focus of international organizations and developing country governments. The current research focuses on the analysis of the effects of microfinance and remittances on reducing poverty. It uses a sample of 97 developing countries for the period 1990-2020. It conducts robust OLS estimations. It finds that microfinance reduces poverty when remittances are not added to the OLS regression model. However, when remittances are included in the model, microfinance does not have a significant reducing effect on poverty even remittances do.

Effect of AI & Automation in Marketing & Social Media

Affan Syed Mahmood Hussain, Graduate Student, Business Analytics

Hira Ali, Graduate Student, Business Analytics

Purpose: This study aims to illuminate the evolution of marketing practices from traditional methodologies to advanced Artificial Intelligence (AI)-enhanced strategies. Specifically, it explores how AI technologies facilitate a paradigm shift towards more efficient, personalized, and data-driven marketing efforts, with a spotlight on the application of such technologies in Bahrain's social media marketing landscape.

Methodology: The research synthesizes insights from seven critical studies, employing a qualitative analysis approach. It juxtaposes traditional marketing practices with contemporary AI-driven tools and methodologies, examining their efficacy in enhancing consumer engagement and personalizing marketing communications. The analysis extends to a case study on Bahrain, utilizing secondary data to explore the regional implementation and outcomes of AI in marketing.

Results: Preliminary findings indicate that AI significantly augments marketing strategies by offering predictive analytics, personalized advertising, and enhanced consumer insights. Tools like Optimail, Seventh Sense, Jasper, and Writesonic have been instrumental in optimizing marketing campaigns, generating engaging content, and innovating graphic design. The case study of Bahrain further demonstrates AI's capacity to elevate social media marketing strategies, leading to improved consumer engagement and satisfaction.

Conclusions: The integration of AI into marketing signifies a notable advancement from traditional, broad-spectrum approaches to more targeted, efficient, and interactive strategies. AI doesn't just make marketing tasks easier; it dives deep into understanding what makes consumers tick. It's more than a mere upgrade—it's a revolution in digital marketing. This research makes one thing crystal clear: for businesses to thrive in the swift currents of today's

digital era, adopting AI is crucial, not optional.

Enhancing Accountants' Productivity: Impact of Deploying Automation Bots

Anas Shakeel, Graduate Student, Business Analytics

My paper examines how robotic process automation can help accountants work efficiently, especially during busy times like tax season. We want to see if these bots can make accountants' lives easier and help them do their jobs faster. After working with accountants and looking at data to see how things changed after using automation. Using bots reduced accountants' time on boring tasks like entering data and filing taxes. This meant they had more time to do important things like helping clients with tax advice. We also learned that automation bots are different from AI. Bots follow rules and do tasks they are programmed for, while AI can think and make decisions. My study shows that bots can make accountants happier and improve client relationships. It also helps businesses run better overall.

Enabling AI through Mix-Precision Computing

Chintan Mehta, Graduate Student, Computer Science

Artificial intelligence (AI) is transforming how we interact with computers and information. Unlike traditional systems that merely retrieve data, AI now has the ability to generate new information in response to user queries. This breakthrough enables instant access to personalized information globally. However, there is a problem: AI systems consume substantially more energy, which is particularly challenging for developing countries with constrained access to energy.

We may have discovered a solution to this problem. Consider AI computation akin to baking a cake. Some ingredients, like flour and water, require exact measurements, while others, such as chocolate chips and frosting, can be less exact. Similarly, certain AI calculations demand higher numerical precision while others can tolerate lower precision. Strategically blending these precisions enables us to achieve peak energy efficiency without sacrificing accuracy.

Our experiments have yielded promising results, showcasing the effectiveness of Mix-Precision methods across diverse AI domains. Employing these methods has enabled us to accelerate Image Recognition tasks by up to 90% and Signal Processing tasks by over 50%. Currently, active research is underway to test our method on Language Generation tasks, demonstrating its versatility.

In conclusion, the computational acceleration achieved with our method underscores its effectiveness in achieving energy-efficient AI. These findings have already been presented at numerous national conferences, urging fellow AI researchers to embrace the novel computational methods developed here at MSU.

An Assessment of the Effects of Remittances on Healthcare Expenses in Developing Countries

Phyo Wai Yan Win Swe, Graduate Student, Economics

The United Nations sustainable development goal number 3 is “Ensure healthy lives and promote well-being for all at all ages” (United Nations, 2024). In 2021, 25 million children missed out on important immunizations, and malaria cases increased to 247 million in 2021 from 245 million in 2020 (United Nations, 2024). Reducing the negative effects of diseases and promoting better health has been a focus of international organizations and developing country governments. The current research focuses on estimating a long-run causal relationship between per capita international remittances and health care expenditures in developing countries. It uses a large sample of developing countries for the period 2000-2020. It aims to estimate the remittances of elasticity of health expenditure as well as the income elasticity of health expenditure for developing countries. The data analysis includes panel unit root tests, panel cointegration tests, and long-run relationship estimations. We expect that remittances contribute to health expenditures, which is related to improving health in developing countries.

An assessment of the relationship between remittances and food security in developing countries

Megan Widner, Graduate Student, Economics

The United Nations sustainable development goal number 2 is “End hunger, achieve food security and improved nutrition and promote sustainable agriculture” (United Nations, 2024). It is expected that more than 600 million people will face hunger in 2030 (United Nations, 2024). Eliminating hunger and promoting food security is an important focus of international organizations and governments. To reduce hunger, it is important to put all available resources to work. International remittances are an important source of money for households in developing countries. Remittances can contribute to increasing household expenditures on education, health, and food. Thus, it is important to study the relationship between remittances and food security in developing countries. This is the focus of the current research. It uses a sample of 81 developing countries for the period 1990-2020. It uses the global food security index published by The Economist. The index comprises four pillars: economic resilience, production and agricultural resilience, nutritional resilience, and environmental resilience (The Economist, 2022). We conduct Panel Generalized Methods of Moments Instrumental Variable estimations to estimate the effects of remittances on food security. The results suggest that remittances increase food security in developing countries. The results have policy implications regarding hunger reduction and promoting food security.

The Effects of the Menstrual Cycle on Recovery after Exercise in Division II Female Athletes

Noah Reinertz, Graduate Student, Exercise Physiology and Athletic Training

Female participation in sports has increased significantly, yet research on female athletes'

recovery needs remains lacking. The proposed study will investigate the impact of the menstrual cycle on recovery from strength training in healthy women.

Heart rate variability (HRV), jumping performance, and psychological well-being will be measured at two specific stages of the menstrual cycle. It is hypothesized that HRV and jumping performance will be lowest during the luteal phase (high progesterone), coinciding with greater perceived fatigue and lower mood.

This research aims to provide female athletes and coaches with evidence-based information to optimize training strategies and performance across the menstrual cycle. The study is limited to healthy, division II NCAA females and may not generalize to the overall population or those with irregular cycles.

This research contributes to a deeper understanding of female athlete physiology and offers practical tools for enhancing recovery and well-being for females participating in sport.

The Twentieth Century Reconsidered: Political Dealignment and Postwar Conservatism, 1945-1990

Isabella Black, Graduate Student, History

The world of conservatism eludes historians. To be sure, scholars have captured certain groups within the “New Right” or delved into the minds of William F. Buckley, Jr., Leo Brent Bozell, III, Whittaker Chambers; but research into postwar political ideology and praxis have done little to satisfactorily explain how these groups engaged with each other, their motivation for doing so, the impact of their eventual fusion, and how they gained access to Washington in the mid-nineties. As such, this study defines and examines postwar conservatism (1945-1990) in a most novel way: within the context of political dealignment. On the one hand, this research delves into the lives and minds of postwar conservatives, but it also engages with political theory as a means of expanding the potential universe of their genesis and impact. For this reason, this research employs a dialectic approach to synthesize the challenges and malaise of postwar conservatives within larger political themes. This approach suggests that postwar conservatives were distinct from the conservatism that existed prior to WWII and, because of political dealignment, manufactured electoral victories in the mid-nineties within the Republican Party. The conflation between “conservative” and “Republican,” like much of the postwar conservative world, was intentional and the result of decades of intellectualism, organization, mobilization, and electoral strategizing. To arrive at this conclusion and others like it, this research surveys early twentieth-century alignment, defines dealignment and dealigned political climates, and examines postwar conservatism in the intellectual, populist, and electoral spheres between 1945 and 1990.

RESEARCH RECOGNITION RECEPTION

Please join the Office of Sponsored Programs and research (OSPR) for a reception celebrating the scholarly and creative accomplishments of faculty at **Midwestern State University**

**APRIL 17
3:30PM
Graduate Student
Resource Center
FERGUSON 202
PLEASE RSVP BY APRIL 15**



Fain Elementary Supply Drive

Help the Office of Undergraduate Research support the Fain Elementary PBL program by donating supplies to the FE Maker Space Supply Drive! This is short list of some of the items they use to create their research projects. A donation box is set up by the Office of Undergraduate Research, CSC 161.

- Markers/Pencils
- Trifold Presentation Board
- Standard Poster Board-white
- Construction Paper or Cardstock
- Paint-non-toxic Tempura or Acrylic
- Paint Brushes
- School glue
- Styrofoam shapes

- Popsicle sticks/small wood balls, pegs
- Recyclable materials- clean plastic containers/jars. Cardboard tubes, packaging, boxes
- Fiber- string, yarn, cording, felt, pom poms, fabric
- Books-Age Appropriate Learning or How-to

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MSU Texas Student Ambassador volunteers

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First Year Mustangs Adventure: Melissa Nivens and Clara Easterling

The Clark Student Center Staff, Custodians, and set-up crew

MSU Texas Marketing & Public Information Department

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