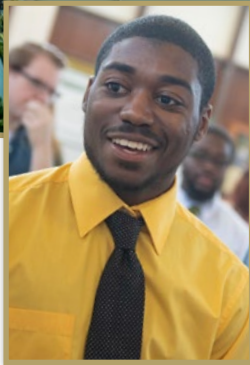


THE NINTH ANNUAL
CENTER FOR RESEARCH AND
CREATIVITY SYMPOSIUM



METHODIST
UNIVERSITY

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MISSION STATEMENT OF THE METHODIST UNIVERSITY CENTER FOR RESEARCH AND CREATIVITY

The mission of the Methodist University Center for Research and Creativity is to establish educational opportunities that are collaborative and inquiry-based with the intention that every Methodist University student has access to exploratory learning across the curriculum.

“Faculty research and creativity are at the heart of the academic endeavor. Not only do these activities help to create new knowledge and new experience, but they add tremendously to teaching and learning. This work models for students the academic rigor and care involved in knowledge production, engages students in the process itself, and helps students become more critical information consumers for the rest of their lives—a vital skill in today’s environment.”

– Dr. Stanley T. Wearden
President



PRESENTATIONS

Mathematics

Temperature Model for D. Keith Allison Hall	Jacob Mireles
Graphs, Network Flows, and the 5-Flow Conjecture	Christian Austin
Pascal's Triangle	Christian Austin
American Roulette	Kelby West

Applied Communication

Persuasion Around Us	Megan Andrews, Shannon Christie, Michael Forsythe, Makalika Garner, Jerrell Peevy, & Kacie Perusek
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Engineering

Reciprocal Walker Ergonomic Analysis	Keith Hardie & Natasha Ng'ambi
Evacuation Modeling from Indoor Areas During a Disaster	Endashaw Tonja
Patient Waiting Time in Operating Room	Mohammed Mahdi & Busani Mhlanga
Application of Lean to Reduce Medication Return Errors in Health Care	Alex Kachler & Thembe Shabnagu

Interdisciplinary Psychological Perspectives

Brief Mindfulness and Self-Compassion Based Interventions for Anxiety in Undergraduates	Elizabeth Ruth Hall
Food Insecurity: Hunger for an Education	Fredlisha Lansana
The Correlation Between a Person's Race/Ethnicity and the Assessment of a Traffic Stop	Emilli Rauch
Negative Influences on Female Field Hockey Coaches' Needs Satisfaction and Ability to Meet Athletes' Needs	Taylor Jackson

Applied Communication: Dynamic Leader-Follower Relationships

Addicted to Influence: Building Bridges Across Cultures, Generations, and Socioeconomic Conditions	Jamie Pendergrass
Presidential Transparency: FDR's Bold Persistent Experimentation to George W. Bush's Iraq Shortcomings Speech	Andrew Scogin
The Shepherd and the Lamb: A Symbiotic View of Leadership	Jeremiah Wolbers

Political Science: American Perspectives

Sanctuary Cities in the United States: Causal Factors and Variation among the States	Tomomi Shiotani
Attitudes toward Capital Punishment in America: An Analysis of Survey Data	Tenzin Thinley
Understanding the Information Flow During an Election Year	Kseniia Petrova

Psychology: Campus Issues

A Dog's Presence in the Reduction of Test Anxiety for Students	Kiana Lisette Guardado
Anxiety and Depression in Relationships	Paul Kramer
Alcohol Consumption and Risky Sexual Behavior	Hillary Read
Just World Hypothesis and Victim Blaming	Kyle McKean

PRESENTATIONS

Computer Science[Institute for Sports Science and Wellness Website](#)Carolyn Bunce,
Lemlem Gebremichele,
& Bryson T. Pinkney**Applied Communication & Mass Communication**[Study Abroad: Challenges and Opportunities](#)Kseniia Petrova, Catia Dombaxe,
Allyson Hays, Mandisa Chabwera,
Kalkidan Gebrehiwot,
Favour Adejor-Omale, &
Siphumelele Njapa[Panel Presentation: Reporting Across the World](#)Kseniia Petrova, Srđan Colakovic,
Rachel Townsend, Metehan Fidan,
Jesed Pando, Yana Marchenko,
Karma Choki, & Ann Tukari**Science: It's Science!**[Synthesis of 2, 2-Difluorinated-\[6\]-Gingerol Using Selective C-C Bond Cleavage](#)

Bi Youan Eric Tra

[Pluto: A Summary of Data from the New Horizons Spacecraft](#)

Gabrielle Robbins

Psychology: Sleep and Cognitive Response[Attitude Change and Galvanic Skin Response when Presented with a Cognitive Dissonance Argument](#)

Alberto Pérez Arroyo

[The Effects of White Noise on Stroop Test Performance](#)

Stephanie Campbell

[Does Sleep and Anxiety Affect Eyewitness Testimony?](#)

Kayla E. Goldsmith

[Authority Levels, Sleep, and the Misinformation Effect](#)

Kyle R. Noddin

Political Science: Global Perspectives[Gender Equality and Political Representation: A Global Analysis](#)

Haja Mohamed Nafe

[Understanding Environmental Policies in the World: The Role of Citizens and Governments](#)

Dwayne Green

[Climate Change: Peace and Conflict](#)

Mujahed Aghbar

History: Witches, Tails, and Pointy Hats[Salem before the Witch Trials](#)

Sabrina Nausadis

[Did African-American Soldiers Have Tails?: A Study of Inequality Overseas in World War II](#)

Andre M. Emanuel

[The Klan in the 1920's: Radical White Supremacists Disguised as Heroes](#)

Leilani Holt

POSTERS

Undergraduate Posters

Detection of Blood Concealed by Paint	Lisa Kasamba & Catia Dombaxe
Determination of Ephedrine and Methyllhexanamine in Weight Loss Supplements Using Gas Chromatography-Mass Spectrometry (GC-MS) and Proton Nuclear Magnetic Resonance (H-NMR)	Catia Dombaxe
Allison Hall Computer Rooms	Charles Jacobs, Conan Hooker Humphries, & Kalkidan Gebrehiwot
Cape Fear Valley Medication Return Process Improvement	Alex Kachler & Thembela Shabnagu
Hendricks Science Parking Lot and Sidewalk Flooding	Kit Allman, LaMont Murray, Elijah Cutler, & Seth Wilson
Longest Nature Trail	Ian Davis, Jesse Leyble, Jeremy McNeill, & Drew Topoly
Parking	Riley Caudle, Tyree Brown, Andrew Bradshaw, & Jaquan Hayes
Patient Flow in Operating Room	Mohammed Mahdi & Busani Mhlanga
Pauline Longest Nature Trail	Steven Harris, Colby Cox, Sean Coleman, & Allen Moore
Reciprocal Walker	Keith Hardie & Natasha Ng'ambi
Cramer's Rule and its Application to an $n \times n$ Matrix System	Hamza Boubacar Kassoum
Fibonacci Sequence and Numbers	Felipe Bautista
L'Hôpital's Rule	Kelby West
The Four Color Problem	Aiden Sherry
Trigonometric Functions	Yitong Zhang
Venn Diagrams	Wade Jackson
Biomechanics during Lower Extremity Functional Tests in Female Collegiate Athletes Related to Knee Valgus	Sierra Swasey
Knee Extensor Torque and Muscle Activity Differently Relate to Landing Strategies in Female Collegiate Athletes	Nathan Whicker & Sierra Swasey
Comparing Muscle Activation Sequence and Force Production during Sumo and Conventional Deadlifts	Nicholas Lee, Michael DeWitt, & Kevin Hall
Exercise and Literary Reading Comprehension: An Alternative to Sedentary Studying	Jack O'Malley
Shot Speed and Accuracy for Men's Lacrosse: Overhead, Sidearm and Underhand Shots	Dakota Gross & Hunter Vaughan
Case Analysis from Anne Chesnutt Middle School	Serena Harper-Smith
Case Analysis from Connections of Cumberland County	Lakeshia Holmes
Case Analysis from Fayetteville Area Operation Inasmuch	Gregory Sampson
Case Analysis from Fayetteville Urban Ministry	Joshebekashah Morris
Case Analysis from Fayetteville Urban Ministry Find-a-Friend	Julie Lucas
Case Analysis from The Care Clinic	Kandus Fulmore
Case Analysis of Guardian Ad Litem Child	Kiara Brown
Case Analysis on Making Proud Choices! as presented by Teen Connections, in partnership with Planned Parenthood	Jessica Moretz
Food Insecurity: Hunger for an Education	Fredlisha Lansana

THIRD ANNUAL NURSING RESEARCH AND COMMUNITY SYMPOSIUM

Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) Use Outside Trauma Centers

Virginia "Beth" Arce

REBOA use for non-compressible hemorrhage in trauma patients is on the rise, but is currently not used in healthcare settings without immediate surgical interventions. With the military reporting successful REBOA use in pre-hospital settings, the use of REBOA in rural hospital settings may be seen more in the near future. Exploring REBOA training for rural healthcare teams is imperative.

Impact of Didactic Versus Simulation Education in the Treatment of Malignant Hyperthermia

Andrew Ballard

Malignant Hyperthermia (MH) is a low-incidence, high-acuity, genetically-based disorder, requiring swift recognition and intervention. Education and training in critical health events, such as an MH crisis, improve recognition and treatment.

The Impact of Chronic Illness on the Healthy Sibling

Lindsay Brennan

A chronically ill child can impose a great deal of stress on a family. The increased need for time and resources from the parents means the healthy sibling can become forgotten or neglected, leading to maladaptive behaviors. Providing care as a nurse to both the ill child and the healthy sibling can promote well-being for the family.

Mozart's Little Prodigies: Exploring the Value of Music Therapy in the Neonatal Intensive Care unit (NICU)

Leslie Camino

Music therapy is a nontraditional non-pharmacological approach that has been researched in the premature infant population for pain management. Compared to sucrose—the standard intervention—music could have more benefits in the total care of the premature infant, but more research is needed to make it a standard intervention.

Nurse Staffing Standards in Hospitals: Sandhills Area, N.C.

Angie Davis

Despite the abundance of literature that supports decreased nurse-patient ratios, nurses who work in hospitals located within the Sandhills Area experience challenging patient workloads, leading to poor patient outcomes and high turnover rates. Legislated mandatory staffing ratios may be one of the solutions to overcoming this issue.

Screen Time and ADHD

Joy Davis

Exploration of the relationship of screen time exposure in children vs. the development of ADHD. With the increasing prevalence of ADHD in young children, further exploration is needed to determine if screen time is a causal factor.

Impacts of Screening, Social Supports, and Skills Training on Postpartum Depression

Eileen Edmondson

Depression can first present itself in new mothers, can be recurring, or can even worsen during postpartum. Universal screening needs to be implemented in order to detect the early symptoms. Therapy is very effective, especially alongside a support system. Together, they mitigate symptom severity, improve outcomes, and ensure that the first steps into parenting are steady.

Newborn Circumcisions: The Painful Truth

Natalia Frias

Currently in the medical community, it is not well understood whether newborns feel pain. This leads to poor pain management during common procedures, such as newborn circumcision. The procedure is not routinely recommended by the American Academy of Pediatrics, due, in part, to the unnecessary pain experienced by infants, and is therefore left to the discretion of the parents.

Gut Microbiome Composition and its Impact on Obesity in Populations with Low Breastfeeding Rates

Casey Hobbs

Research indicates that breastfeeding promotes the development of a favorable gut microbiome that can protect against chronic conditions such as obesity. However, breastfeeding rates are lowest in rural populations, while obesity rates remain high. Perhaps increasing breastfeeding rates in rural populations can reverse the growing obesity rates in rural populations?

Alzheimer's: Reversal Capabilities by Pharmacological or Dietary Interventions

Tonia Howard

Alzheimer's disease has left a sense of an elderly state inevitably in conjunction with permanent cognitive impairment. Nurses have refined comfort measures and care plans to maintain a level of independence for Alzheimer's patients, but continued research and specifically created medications and dietary interventions may reverse the struggles associated with Alzheimer's.

Chronic Pain Management

Edward Jones

Chronic pain is one of the most common reasons adults seek medical care. Treatment likely involves opiate medications that contribute to the most prescription drug-related overdose deaths in the United States. This project explores the efficacy of cannabis as a viable alternative method for treatment of chronic pain.

Water Birthing and Perineal Trauma

Haley Jones

Water birthing has been known to help soothe the discomforts felt during labor. There may be more to water birth than just pain management. This poster will explore the impact of water birth on perineal trauma.

Exploring the Barriers to Therapeutic Communication among Nurses

Daniel Larimore

This is a grounded theory and qualitative analysis of barriers to therapeutic communication in nursing. Several barriers are known to affect nursing care, including: time management and high patient-to-nurse ratios. The goal would be to answer questions regarding common barriers, and to potentiate future research focused on how we can improve therapeutic communication.

Interventions to Reduce New Graduate Registered Nurse Turnover

Jonathan Pannel

Nurse turnover is a problem for healthcare organizations nationally. Current studies suggest a correlation between clinical transition and education with the change in professions for new graduate registered nurses. With the current predictions on nurse shortages in North Carolina alone, the retention of new graduates is vital to maintain the appropriate staffing to provide patient care. Interventions to retain and recruit new graduate registered nurses have been implemented to include preceptorships/mentorships, nurse residency programs, and nurse internship or externships.

THIRD ANNUAL NURSING RESEARCH AND COMMUNITY SYMPOSIUM (CONTINUED)

Mindfulness Interventions and Diabetes: Could It Improve Health Outcomes?**Jessica Okorieocha**

There are many benefits to mindfulness practices, including reducing stress. Managing diabetes mellitus can be a problem for those having difficulty coping with stress. Mindfulness-based interventions are analyzed as an aide to controlling blood sugar, weight, and other variables used to determine health in adults living with diabetes.

Normalizing Obesity in America**Andrew Mayefskie**

From a young age, Americans are shaped and molded by their parents, and generally have little control over what they eat. Childhood obesity is a growing epidemic that seems to be caused by certain parenting styles, along with other controllable factors. However, adulthood obesity is also climbing, and is something each person can control, but according to research, most do not know how to live healthier lifestyles and cannot tell a healthy person from someone who is considered to be obese.

Preexisting Mental Illness and Pregnancy**Samantha Oliphant**

An examination of common challenges faced by women with preexisting mental health conditions during pregnancy. Increased awareness of the specific barriers allows potential interventions to be identified and used to reduce the disparities within care.

Interventions to Improve the Quality of Life of Night-Shift Nurses**Ingrid Pol**

The health industry relies heavily on night-shift nurses to provide round-the-clock care. Nonetheless, night-shift work is linked to poor sleep quality, increased risk for cardiovascular disease and metabolic syndrome, decreased job performance, and increased risk for medication errors. Nurse managers must advocate for interventions in order to improve the quality of life of night-shift nurses.

Every Childhood Trauma Experienced, is a Step Closer to Diabetes**Sabrina Posey**

Since the late 1990s, researchers have recognized the relationship between childhood trauma and the development of Diabetes. Diabetes has been on a steady rise in the U.S the past decade, and is not predicted to slow down anytime soon. Identifying causal factors earlier in life could be the answer in reducing diabetes in the U.S.

The Neurological Effects of Methotrexate in Acute Lymphoblastic Leukemia Childhood Survivors**Annabelle Ronelli**

Acute Lymphoblastic Leukemia is the most common cancer among children. The dramatic increase in survival rates has posed a new problem for professionals who are becoming increasingly more aware of several detrimental effects. Some life-saving interventions may require further research to mitigate the negative effects of these important treatments.

The Effect of Vaginal Health Education on Recurrent Infections**Alondra Sedano**

Despite ample research on prevention, most women lack the knowledge of how to prevent episodes of vaginal infections. Prevention is important because numerous vaginal infections make women more susceptible to sexually-transmitted diseases or other health complications. There should be more efforts to educate women on the prevention of vaginal infections.

Social Media Use and Adolescent Mental Health**Crystal Smith**

The popularity of social media is undeniable in the adolescent population. With such a large presence in the everyday lives of adolescents, its impact on mental health should be considered. This research proposal attempts to determine if there is a correlation between social media and depression.

Fertility and Risk-Taking Behaviors Education in Adolescents**Jasmine Tapscott**

Fertility has been on a decline within recent years. Although there have been advances in the practice of fertility salvation using advanced techniques—such as in vitro fertilization—there remains a heavy lack in fertility awareness education. This research proposes a study to determine the effectiveness of fertility and risk-taking behavior education on long-term fertility rates.

The Effect of Whole Blood Transfusion Compared to Balanced 1:1:1 Component Therapy on Survival in Poly-Trauma Patients**Karina Walker**

The recent successful use of fresh whole blood for the management of poly-trauma in austere environments suggests this treatment modality could be a superior alternative to conventional blood component therapy. This research attempts to address the lack of data comparing survivability outcomes and transfusion reactions between the two therapy strategies.

Evaluating the Effects of Nurse Residency Programs on Transition to Practice**McKayla K. Walker**

Healthcare organizations have begun implementing nurse residency programs in order to provide the skills and experiences necessary to facilitate the transition to practice in new graduate nurses. This research study proposes to analyze and evaluate the effect that nurse residency programs have on new graduate nurses.

Providing Physician Assistant Students with Clinical Skills to Support Breastfeeding**Jarold "Tom" Johnston**

Despite findings that as many as 80 percent of new mothers require breastfeeding support in the first month postpartum, PAs are unprepared to offer even rudimentary assistance. This study evaluated the feasibility of a one-day clinical skills workshop for PA students, designed to promote self-efficacy at providing breastfeeding supportive care.

The Ninth Annual Center for Research and Creativity Symposium



MATHEMATICS

Temperature Model for D. Keith Allison Hall

Jacob Mireles | Senior; Mathematics and Computer Science; Fayetteville, N.C.

Advisor: Dr. Jie Zhou, Mathematics

This talk will describe the inherent issue with temperature control in D. Keith Allison Hall and the factors that are involved when calculating the temperature in any given space. Differential equations will be used to accurately account for a variety of factors that affect a given space,

along with Newton's Law of Heating and Cooling. With this information, a model will be created that accurately represents the reasons for the temperature change in D. Keith Allison Hall and the cause of inconsistent heating and cooling throughout the building. The results from this research will be presented in order to raise awareness of the inefficient temperature control in D. Keith Allison Hall, and to demonstrate the importance of maintaining efficient temperature control among the buildings at Methodist University.

Graphs, Network Flows, and the 5-Flow Conjecture

Christian Austin | Senior; Mathematics & Computer Science; Fayetteville, N.C.

Advisor: Dr. Peggy Batten, Mathematics

Network flows are a common object of study in engineering and operations research. Methods exist to find, for example, the maximum amount of material that can be pushed through a network, given certain constraints. However, they are also studied by mathematicians for their purely algebraic properties. One of the more famous, and as

of yet unsolved, problems related to network flows is called the 5-flow conjecture, first proposed by mathematician William Tutte in 1954. This talk will introduce graphs, networks, network flows, and the 5-flow conjecture, and will discuss some of the research that has been performed on the 5-flow conjecture. Network flows and graph theory are vital to the solution of many applications. Shortest routes, both in distance and cost, computer networking, and page ranking are a few such applications. Graph theory was first studied by Leonhard Euler in the 1700's. The 5-flow conjecture, although currently unsolved, continues to be researched with some intermediate conclusions.

Pascal's Triangle

Christian Austin | Senior; Mathematics; Fayetteville, N.C.

Advisor: Dr. Kathleen Fick, Mathematics

This talk will discuss Pascal's Triangle, one of the most famous structures in mathematics. Pascal's Triangle, as an object of study, has

a history which begins long before its eponym, Blaise Pascal, was born, spanning through multiple generations and across multiple cultures. Along with a rich history, Pascal's Triangle is abundant with mathematical truths and patterns. This talk will give a brief history of the triangle, and will also discuss some of its most fascinating properties.

American Roulette

Kelby West | Senior; Beaufort, N.C.

Advisor: Dr. Peggy Batten, Mathematics

This talk will describe the game American Roulette and the four different types of bets that can be placed at casinos. Each bet has a different payout that will either benefit or hinder the gambler. We can use mathematics to determine the probability of each bet and decide the best option for

the gambler. This talk will also look at creating new bets and deciding if casinos should add new bets to American Roulette. Mathematics and Game Theory have a long intertwined history. Mathematicians, Pierre de Fermat and Blaise Pascal, solved mathematical problems involving game theory in the 1600's. There is still a fascination with games today. The American Roulette wheel is a classic game of chance and this research project will expose the outcomes of some different versions of the game.

APPLIED COMMUNICATION

Persuasion Around Us

Megan Andrews | Junior; Applied Communication with a Concentration in Health Communication; Henderson, N.C.

Shannon Christie | Junior; Applied Communication with a Concentration in Organizational Leadership; Brooklyn, N.Y.

Michael Forsythe | Junior; Applied Communication; Clawson, Mich

Makalika Garner | Senior; Applied Communication with a Concentration in Organizational Communication & Leadership; Lafayette, La.

Jerrell Peevy | Sophomore, Business with a Concentration in Resort, Club & Hospitality Management; Washington, DC

Kacie Perusek | Junior; Applied Communication with a Concentration in Organizational Communication & Leadership; Pinehurst, N.C.

Advisor: Prof. Brenda Mitchell, Applied Communication

The goal of this presentation is to bring awareness to persuasion around us; specifically, how to identify it, avoid malicious persuasion, and how to effectively influence others. Through interviews with the students and faculty at Methodist University, and research on the topic of persuasion, we will illustrate how persuasion is apparent throughout several majors on campus and its impact on everyday life. We will further explore how influence and persuasion is essential in any career field, as building trust, motivating others, creating visibility, and clear communication is imperative to the success of a company/club/business.



ENGINEERING

Reciprocal Walker Ergonomic Analysis

Keith Hardie | Senior; Engineering with a Concentration in Industrial & Systems Engineering; Oxford, N.C.

Natasha Ng'ambi | Senior; Engineering with a Concentration in Industrial & Systems Engineering; Lusaka, Zambia

Advisor: Dr. Denise H. Bauer, Engineering

Our goal is to design and fabricate a reciprocal walker that naturally inspires reciprocal motion between the arms and legs, particularly for individuals who have suffered a stroke. This will be a proof-of-concept prototype for a walking assist machine that facilitates the rehabilitation of

stroke patients back to a natural gait. We will discuss the ergonomics and human factor principles we utilized throughout the engineering design process, and how they relate to the biomechanical analysis performed by the Occupational Therapy team members. During the presentation, a number of the preliminary designs will be discussed and an analysis of their ergonomic design will be shared. Additionally, we will discuss the decision-making tools that we utilized, including a Weighted Attribute Chart of Client Needs and a Value-Score table for benchmarking and design selection. Finally, we will discuss the advantages of our product due to its user-centered design.

Evacuation Modeling from Indoor Areas During a Disaster

Endashaw Tonja | Senior, Engineering and Mathematics with a Concentration in Industrial & Systems Engineering; Addis Ababa, Ethiopia

Advisors: Dr. Denise Bauer, Engineering; Dr. Parisa Eimanzadeh, Engineering; Dr. Jie Zhou, Mathematics

There are many different reasons for a disaster to happen, whether man-made or natural. In both cases, the initial moments surrounding a disaster are very crucial. This presentation focuses on evacuation from indoor areas during disasters. Engineers play an enormous role when

it comes to dealing with disaster and emergency evacuations. The main responsibility of engineers is to plan for and assist building inhabitants and rescuers during emergency response in a timely and safe manner. During an emergency, engineers do not have enough time to make the perfect decisions; therefore, they must make an effective decision in a short time. During an emergency evacuation, engineers work to come up with the best way to evacuate people from indoor facilities, buildings, stadiums, or malls. Furthermore, engineers also work on designing a better way to supply equipment and tools to minimize the effect of a disaster and to save people's lives and properties. This presentation focuses on how engineers use operations research in evacuation modeling, which is extremely important nowadays due to the increasing complexity of buildings.

Patient Waiting Time in Operating Room

Mohammed Mahdi | Senior; Engineering with a Concentration in Industrial & Systems Engineering; Baghdad, Iraq

Busani Mhlanga | Senior; Engineering with a Concentration in Industrial & Systems Engineering; Mbabane, Swaziland

Advisor: Dr. Girish Upreti, Engineering

Cape Fear Valley Hospital is one of the busiest hospitals in the area. The hospital does approximately 35 to 45 surgeries a day with only eight operating rooms (OR). One of the main concerns is the wait time before surgery, as the process currently is unpredictable and there is a lot of lost

time between processes of patient flow from the time they arrive until they get to the room. A lot of patients are brought to the hospital two to three hours before their surgery. We are working directly with the quality team and hospital professionals on conducting time studies by shadowing nurses as the patient arrives at the hospital in the Short Stay room until they are sent to the OR. This will allow us to reduce the wait times by measuring, monitoring, and managing wait times. We are looking to reduce the arrival time before surgery to an hour instead of three hours; we believe this would also increase patient satisfaction.

ENGINEERING (CONTINUED)

Application of Lean to Reduce Medication Return Errors in Health Care

Alex Kachler | Senior; Engineering with a Concentration in Industrial & Systems Engineering; Lithia, Fla.

Themba Shabangu | Senior; Engineering with a Concentration in Industrial & Systems Engineering; Mbabane, Swaziland

Advisor: Dr. Girish Upreti, Engineering

The Cape Fear Valley Hospital sees hundreds of inpatients every week that are often taking medication. As it is very important for the hospital's staff to document these medications, the patients are encouraged to bring in any medications that they are currently taking. However, the hospital often fails to return these medications to their patients. This is because the Cape Fear Valley Hospital does not have a standardized process for

the storing and returning of medications. Our team used Lean tools such as DMAIC to standardize this process and reduce the amount of patients that are going home without their necessary medication. DMAIC is an acronym for Define, Measure, Analyze, Improve, and Control, and using this step-by-step process ensures that the problem is carefully examined from all angles. Thanks to this detailed process, we thoroughly understood the problem and its root causes before we started suggesting solutions. Implications of this study are that we will save the nurses time when assessing patients, more patients will get their medications when they check out, less space will be taken up by patient's medications, and patients will save money because they will not have to replace lost medication. In turn, this will lead to increased patient satisfaction, because more of their requirements will be satisfied.



INTERDISCIPLINARY PSYCHOLOGICAL PERSPECTIVES

Brief Mindfulness and Self-Compassion Based Interventions for Anxiety in Undergraduates

Elizabeth Ruth Hall | Senior; Psychology; Honea Path, S.C.

Advisors: Dr. Mark Kline, Psychology; Dr. Katharine Snyder, Psychology

This study investigates the relationship between mindfulness, self-compassion, and state anxiety. Participants will be randomly assigned to the control group, mindfulness meditation, or self-compassion meditation intervention. Prior to treatment, participants will first sign an informed consent form and then complete self-assessment measures on State Anxiety (STAI), Self-Compassion, and State-Mindfulness (SMS). The mindfulness meditation group will undergo a guided sitting meditation; the self-compassion meditation group will undergo a guided sitting loving-

kindness meditation; the control group will undergo a matching distraction task. All tasks will take 15 minutes to complete. Following the intervention, the STAI and SMS will be repeated. It is hypothesized that there will be a main effect of treatment modality such that there will be a significant difference in the state mindfulness scores as a function of the meditation interventions compared to the distraction control task. Furthermore, an interaction is anticipated such that subjects in the self-compassion treatment condition will score differently than all other conditions on the posttest measures. In previous research, self-compassion was found to be a better predictor for the severity of depressive and anxiety symptoms, and for quality of life and wellbeing than mindfulness, but there are few studies that compare mindfulness and self-compassion interventions. The findings of this study may indicate the efficacy of self-compassion meditation for anxiety treatment. Data will be collected following IRB approval.



Food Insecurity: Hunger for an Education

Fredlisha Lansana | Senior; Social Work; Fayetteville, N.C.

Advisor: Tracey Hinds, Social Work

Food Insecurity is common at colleges and universities across the country, potentially undermining the educational success of an untold thousands of students. Given its potential impact, the collective understanding of this issue is far too limited. The existing studies on campus food insecurity have almost exclusively looked at individual colleges and university systems, or focused on community colleges. In order to expand the understanding of campus food insecurity, my goal was to get a good sample of the Methodist University population in order to foster a more expansive understanding of the topic and the effect that it has on our students here at Methodist University. My sample included 60 individuals with the following classification; 8.67 percent student veterans, 0.67

percent international, 7.33 percent night students, 20 percent day students, 35.33 percent commuters, 1.33 percent residential, 0.67 percent staff, 6.67 percent graduate students, and 19.33 percent undergraduates. 32.2 percent of those surveyed shared that they are affected by food insecurity with at least 12.82 percent sharing that they experience this at least twice a week, and 43.59 percent of those affected specifying probably more regularly than twice per week. 42.62 percent of our students surveyed feel they are not performing as well academically because of food insecurity, 18.03 percent are missing class because of hunger, and 4.92 percent of those surveyed would have to choose between eating and purchasing required textbooks. This issue has a negative impact on the educational experience on college campuses all across the country. How can we expect our students and counterparts to focus if their basic needs are not being met?

INTERDISCIPLINARY PSYCHOLOGICAL PERSPECTIVES (CONTINUED)

The Correlation Between a Person’s Race/Ethnicity and the Assessment of a Traffic Stop

Emilli Rauch | Senior; Sociology and Psychology with a Concentration in Counseling/Clinical; Tacoma, Wash.

Advisors: Dr. Paul Knudson, Sociology; Dr. Mark Kline, Psychology

My research is studying the correlation between a person’s race or ethnicity and the assessment of a traffic stop at Methodist University. To do this I will send out a mass email to the student body that explains what the survey is about so that students can make their decision on whether they would like to participate or not. The participants will then click the link to the survey and read the consent form before being able to proceed to the

survey questions. If they still wish to participate they will complete the 23 question survey. Most questions are close-ended Likert and Thurstone scale questions while one is open-ended. After completing the survey they will be thanked for completing, and if they choose to see data results they may contact me at the conclusion of the study. My study will help us look into the correlation between a person’s race and ethnicity and the assessment of a traffic stop on a small liberal arts university campus, like Methodist University. All existing studies have been done on big universities in big cities. Methodist University may also use these data results in order to evaluate how they employ and bring officers on campus in the future. My study is still in progress, so no results have been evaluated at this time, but will be in the near future.

Negative Influences on Female Field Hockey Coaches’ Needs Satisfaction and Ability to Meet Athletes’ Needs

Taylor Jackson | Junior; Psychosocial Aspects of Sport & Coaching; Bedford, Texas

Advisor: Dr. Jamie Robbins, Psychosocial Aspects of Sport & Coaching

According to Self-determination Theory (SDT; Deci & Ryan, 1985), athletes who are more self-determined as opposed to controlled are more apt to continue with sport, put forth greater effort, and have higher levels of self-esteem and well-being (Ryan & Deci, 2002). Rocchi and Pelletier (2018) noted that coaches impact athletes’ needs satisfaction through their supportive or thwarting behaviors. However, very few studies have address coaches’ confidence in their ability to create a supportive environment (Occhino, Mallett, Rynne, & Carlisle, 2014), or in terms of their own needs satisfaction. Therefore, the purpose of the current study was to gain insight into successful female collegiate coaches’ needs satisfaction and their

perceived ability to meet their athletes’ needs of competence, autonomy, and relatedness. Participants included seven highly successful NCAA Division I collegiate female field hockey coaches who averaged 30 years of experience. Coaches were interviewed, and interviews were transcribed verbatim and content analyzed following established procedures. Results yielded six themes in relation to competence (e.g. non-responsive athletes, administration and gender issues, parental influence). Ten themes emerged in relation to autonomy (e.g. available resources, athletic director dependence, fear of student-athlete accusations/management responses). Coaches in general felt connected enough to their faculty, athletic directors and athletes. The four emergent themes were termed: (a) technology, (b) recruiting regulations, (c) athlete personality, and (d) athlete perceptions of coach. Further explanation will be provided regarding each theme in order to demonstrate the significance of coaches’ perceptions in relation to their ultimate coaching behaviors.



APPLIED COMMUNICATION: DYNAMIC LEADER-FOLLOWER RELATIONSHIPS

Addicted to Influence: Building Bridges Across Cultures, Generations, and Socioeconomic Conditions

Jamie Pendergrass | Senior; Psychology; Fairmont, N.C.

Advisor: Dr. Willis M. “Bill” Watt, Applied Communication

This paper investigates factors such as cultural context, power, ethical challenges, and followership through an examination of building relationships across cultures, generations, and socioeconomic conditions.

Presidential Transparency: FDR’s Bold Persistent Experimentation to George W. Bush’s Iraq Shortcomings Speech

Andrew Scogin | Senior; History; Perry, Ga.

Advisor: Dr. Willis M. “Bill” Watt, Applied Communication

This paper offers theories of leadership in a comparative examination of presidential transparency dealing with FDR’s bold experiment and George W. Bush’s response to Iraq shortcomings.

The Shepherd and the Lamb: A Symbiotic View of Leadership

Jeremiah Wolbers | Senior; Global Studies; El Paso, Texas

Advisor: Dr. Willis M. “Bill” Watt, Applied Communication

This paper takes a look at the nature of the symbiotic leader-follower relationship as leaders and followers work together to attain common goals.

POLITICAL SCIENCE: AMERICAN PERSPECTIVES

Sanctuary Cities in the United States: Causal Factors and Variation among the States

Tomomi Shiotani | Senior; Political Science with a Concentration in International Relations; Kobe, Japan

Advisor: Dr. Andrew Ziegler, Political Science

Immigration enforcement has gained momentum under the current administration, as President Donald Trump strongly presents himself as an opponent to illegal immigration, specifically targeting undocumented immigrants from Latin America, like Mexico. This research looked at sanctuary cities. Specifically, this study employed an empirical analysis of quantitative data to examine the factors which account for the difference in the number of sanctuary jurisdictions in the states of the United States. This research revealed that there were some characteristics of the states which result in an inconsistency in the number of sanctuary jurisdictions.

These characteristics include political, social, cultural, and economic factors. The major findings are that the states with more sanctuary jurisdictions tend to have more Democratic Party support, have higher immigrant populations, are located in the Northeast, are wealthier, are less religious, have more educated populations, and are more urbanized than those which have fewer or no sanctuary jurisdictions. The variation of the number of sanctuary jurisdictions among the states across the country cannot be simply explained by the supporting or opposing arguments of policy makers. It is more complex, influenced by aforementioned factors inherent to the states. These findings will help policymakers, and also the public, gain more knowledge on the sanctuary city culture of the country, and also help them to construct more robust, unbiased arguments toward sanctuary cities. Ultimately, this research is proposed with the hope of contributing to bipartisan efforts to make better and unified policies regarding sanctuary cities.

Attitudes toward Capital Punishment in America: An Analysis of Survey Data

Tenzin Thinley | Senior; Political Science with a Concentration in Public Administration; Amdo, Tibet

Advisor: Dr. Andrew Ziegler, Political Science

The topic of capital punishment is always contentious in American politics. The debate regarding the federal and state governments' authority to take an individual's life raises political, constitutional, ethical, and financial issues. This study used quantitative analysis of survey data to examine the factors that account for differences in Americans' attitudes toward capital punishment. The primary findings were that political factors (for example, party affiliation, opinions on the courts, and confidence in government), were much more significant than social and economic factors. Republicans

favor the death penalty more than Democrats, those who have a favorable opinion toward courts are more willing to support the death penalty, and those who have high confidence in the government are more willing to support the death penalty. Factors such as education and religiosity had only minimal effect on attitudes toward support for capital punishment. However, whites do support capital punishment more than African Americans. Economic variables, such as income and opinion on the government's crime spending, do not have much influence on support for capital punishment. As politicians push their agendas, these findings may be useful in recognizing probable support among voters for the specific issue regarding capital punishment. The common logic from this research is that Republican executives and legislators will be affirming their support for capital punishment more than Democrats, because of the strong support of Republican voters toward capital punishment.

Understanding the Information Flow During an Election Year

Kseniia Petrova | Senior; Mass Communications with a Concentration in Journalism; Priozersk, Russia

Advisor: Dr. Kevin Swift, Mass Communications

How does one watch a social media feed during the election year and not to be fooled? Which sources should one look at for non-biased and reliable information about the current state of the election process? Is it better to see politicians' personal media or to rely on journalists' explanations? These and other questions regarding healthy news consumption during

the election cycle will be covered in this presentation. The focus of this presentation is to provide tips and explanations to the public on how to watch and read information about the election from different sources. Through real-life examples, surveys conducted, and statistics provided, this research presentation highlights the main aspects of how one can ensure personal independence and media literacy when overloaded with information about different presidential candidates, their campaigns, updated results, and other information related to the election process. The paper is paired with a Power Point presentation, and that presentation includes interactive parts where the audience will be actively engaged.

PSYCHOLOGY: CAMPUS ISSUES

A Dog's Presence in the Reduction of Test Anxiety for Students

Kiana Lisette Guardado | Senior; Psychology; Southern Pines, N.C.
Advisor: Dr. Mark Kline, Psychology

The topic of my presentation for this year's 2020 symposium discusses how the presence of a dog could help reduce a student's test anxiety. It is becoming such a common occurrence these days that students are using comfort animals to help with everyday anxieties. I wanted to test this for myself and see if there could be a difference made with test anxiety if there is a dog present. My methodology involves inviting students from Methodist University Psychology classes to participate in a study that will

possibly involve a dog during the experiment. I will have them meet with me individually, and students will be randomly selected to have the dog present while they take a test. After the student is done taking the test, I will have them take an anxiety scale after they are finished with their test. The goal for my experiment is to see if the students who had the dog present performed better than the students who did not have a dog present while taking their test. We currently do not have the results because we are working to get the experiment approved by our school's IRB community in order to begin testing. We should have results done before the symposium date, so the results will be shared at that time.

Anxiety and Depression in Relationships

Paul Kramer | Sophomore; Psychology; Oakley, Calif.
Advisor: Dr. Dr. Mark Kline, Psychology

The following is data from a research survey on anxiety and depression within the college dating relationships here at Methodist University. Since

I have attended Methodist University I have noticed the rapid dating habits of my fellow classmates. From passing by one another in the quad holding hands with their significant other, to running into some of the same individuals out at restaurants with a different partner. I believe there is a correlation between the dating frequency and anxiety/depression.

Alcohol Consumption and Risky Sexual Behavior

Hillary Read; Senior; Psychology; Bronx, N.Y.
Advisor: Dr. Mark Kline, Psychology

The study focuses on the correlation between alcohol consumption and risky sexual behavior at Methodist University, a small liberal arts college. Having previously attended SUNY at Oswego, a relatively larger university, and having been exposed to the heavy drinking conducted by students and the dominant party scene, my curiosity grew more intense in relation to how alcohol consumption affects undergraduate students attending

Methodist University. There have been previous studies conducted at larger universities that support the association between alcohol consumption and risky sexual behavior. The data was gathered by sending out surveys to the entire campus and maintaining the confidentiality of every subject who participated in the research. The data gathered from this research will also follow the same procedures. An email will be sent out campus-wide, seeking undergraduates at Methodist University. If they agree to participate in the research, they will read the consent form and proceed to take the survey.

Just World Hypothesis and Victim Blaming

Kyle McKean | Senior; Psychology with a Concentration in Counseling/Clinical; Lincolnton, N.C.
Advisor: Dr. Mark Kline, Psychology

Victim blaming is an extremely common problem in our world. This is even more true for traumatic crimes like rape. My research will investigate which situations and subjects cause false blaming. This will hopefully reveal when victim blaming tends to happen and help us to prevent this behavior in the future. My methodology will begin with inviting subjects into the research room. The subjects will be given one of six different

scenarios. This scenario will follow a main character through a day in their life where they are eventually sexually assaulted. The difference between scenarios will be whether the character is a male or female, if they are a Methodist University student or not, and what the character went into town to do. They either are going into town for an affair or to volunteer. After the subject reads the scenario that they were given, they will then be given a victim blame points survey. This survey will examine how much blame the subject gives to each character in the scenario. This will be examined in order to check the difference in how blame is spread between the different scenarios.

COMPUTER SCIENCE

Institute for Sports Science and Wellness Website

Carolyn Bunce | Senior; Computer Science; Fayetteville, N.C.

Lemlem Gebremichele | Senior; Computer Science; Addis Ababa, Ethiopia

Bryson T Pinkney | Senior; Computer Science; Swansboro N.C.

Advisors: Prof. JerNettie Burney, Computer Science; Dr. Jamie Robbins, Psychosocial Aspects of Sport & Coaching

The students of the Computer Science department seek to use their skills in order to enhance and improve the daily technological use of the Institute for Sports Science and Wellness. The research area of interest is

the redesign of their website, how it can be restructured for better usability for students and the residing faculty, and discovering problem areas that must be addressed for future challenges. Working with the ISSW, the team aims to research the problem space and deliver a working product that the ISSW can utilize. The process for the redesign of this website includes addressing the users' desire for certain functions to be created, initial probing of the current state of the webpage, research for feasible answers to the current constraints, application for redesign concepts, and finally the launch of the final product. Through these steps, the collaboration of the team with the ISSW will produce a feasible website for future use.



APPLIED COMMUNICATION

Study Abroad: Challenges and Opportunities

Kseniia Petrova | Senior; Mass Communications with a Concentration in Journalism; Priozersk, Russia

Catia Dombaxe | Senior; Chemistry with a Concentration in Forensic Science; Luanda, Angola

Allyson Hays | Sophomore; Justice Studies & Applied Forensic Science; Dayton, Ohio

Mandisa Chabwera | Junior; Political Science; Lilongwe, Malawi

Kalkidan Gebrehiwot | Freshman; Engineering; Addis Ababa, Ethiopia

Favour Adejor-Omale | Applied Forensic Science & Psychology, Counseling/Clinical; Lagos, Nigeria

Siphumelele Njapa | Applied Forensic Science & Criminal Justice; Durban, South Africa

Advisor: Prof. Brenda Mitchell, Applied Communication

What can be more exciting than receiving academic credits towards your college degree while experiencing a completely new culture? If you think that this sounds interesting, then studying abroad is a program for you! Studying abroad broadens one's worldview and ways of thinking by experiencing different cultures and traditions. Studying abroad is beneficial for future career opportunities because it provides more life experiences and personal connections, and opportunities for leadership development and self-confidence. We live in the era of globalization; hence, more companies are increasingly seeking candidates who can speak different languages and work in a diverse environment. The more globalization takes place, the more diverse the professional environment becomes. Members of the Speech and Debate team will share personal experience and research that they have done on the topic of studying abroad. Presenters will provide the audience with an in-depth conversation on the benefits of studying abroad, different opportunities that are available, and discuss in detail the requirements, the cost, and scholarships.



MASS COMMUNICATIONS

Panel Presentation: Reporting Across the World

Kseniia Petrova | Senior; Mass Communications with a Concentration in Journalism; Priozersk, Russia

Srdan Colakovic | Sophomore; Mass Communications with a Concentration in TV/Multimedia; Priboj, Serbia

Rachel Townsend | Senior; Mass Communications with a Concentration in Journalism; Fayetteville, N.C.

Metehan Fidan | Junior; Mass Communications with a Concentration in TV/Multimedia; Eskisehir, Turkey

Jesed Pando | Senior; Mass Communications with a Concentration in TV/Multimedia; La Paz, Bolivia

Yana Marchenko | Senior; Marketing; Melitopol, Ukraine

Karma Choki | Freshman; Pre-Nursing; Pemagatshel, Bhutan

Ann Tukari | Sophomore; Financial Economics; Juba, South Sudan

Advisor: Dr. Kevin P. Swift, Mass Communications

MU Reports is the official television news production club of Methodist University. Every semester, we share a diverse collection of news stories

concerning our campus and surrounding communities. MU Reports is a very diverse group. We have students from ten different countries working on bringing the most important school news to the wider student body. Based on personal experience and research, for the MU Symposium, our team prepared a presentation on how news media works in different parts of the world. Students from Russia, Turkey, Bhutan, Serbia, South Sudan, Ukraine, Bolivia, and the United States will talk about how the news media is different in these countries. Presenters will focus on talking in detail about media laws, the public's perspective on news media, and the value of journalism education in their respective countries. Throughout our presentation, we will show examples of articles, photos, video, and other materials from international media in order to illustrate the main points of the presentation. The primary point of this presentation is to bring awareness, to a mostly American audience, that the First Amendment and the freedom of speech that they are used to is not always the case in other countries.

IT'S SCIENCE!

Synthesis of 2,2-Difluorinated-[6]-Gingerol Using Selective C-C Bond Cleavage

Bi Youan Eric Tra | Senior; Chemistry; Ivory Coast
Advisor: Dr. Eun Hoo Kim, Chemistry

[6]-Gingerol is naturally present in the fresh rhizome of ginger. [6]-Gingerol possesses many health benefits including anti-inflammatory, anticancer, and antioxidant properties. It also plays a vital role in preventing the occurrence of heart disease. Hence, the reason for synthesizing 2,2-difluorinated-[6]-gingerol is to test whether it can mimic the health benefits of the naturally occurring [6]-gingerol. Since 2,2-difluorinated-[6]-gingerol is not naturally occurring, it can only be synthesized in the laboratory. The fluorine atom is specifically used in this synthesis because of its high electronegativity value and this gives the carbon-fluorine bond a significant polarity compared to a carbon-

hydrogen bond. As result of that, a more stable and unreactive fluorine compound can be generated, such as 2,2-difluorinated-[6]-gingerol, which is safe and stable to ingest. My research project involves a five-step synthesis. The starting material of the research is vanillylacetone. In the first-step synthesis, the vanillylacetone is protected with tert-butyl(chloro) diphenylsilane (TBDPS-Cl) to synthesize protected vanillylacetone. The second step is fluorination via enolate formation by lithium bis(trimethylsilyl)amide (LiHMDS), which is a strong non-nucleophilic base. For the third step, the intermediate form is then used for further fluorination using Selecfluor®, which is a source of fluorine electrophile, in order to generate pentafluoro gem-diol in an electrophilic addition reaction. The fourth step is an aldol reaction using hexanal. The last step is deprotection using tetra-nbutylammonium fluoride (TBAF), which functions as a deprotecting reagent. This last step delivers the target molecule, which is 2,2-difluorinated-[6]-gingerol.

Pluto: A Summary of Data from the New Horizons Spacecraft

Gabrielle Robbins | Senior; General Science with Teacher Licensure and Concentrations in Earth Science and Biology; San Jose, CA
Advisor: Dr. John Dembosky, Geology

This research review is done for the sole purpose of answering the question: What is Pluto? Multiple sources, including raw data from the astrophysics team at Cornell University, have been analyzed in order to gain an enhanced understanding of what Pluto is and what are that characteristics that make up this planet. Pluto is a dwarf planet in the Milky Way Galaxy that is located between Neptune and the Kuiper Belt. Charon is the largest of Pluto's moons and influences the overall orbit

between itself and the planet of Pluto. The atmosphere of Pluto is primarily methane with small amounts of nitrogen, and it is also speculated to have smaller amounts of carbon monoxide. There are multiple types of terrain concerning the geography of Pluto's surface, and it is speculated to have tectonic processes influenced by the expansion of water ice on the planet's crust. There is a large geographical formation known as the Sputnik Planitia, and there are different forms of geological formations that include bladed terrain and buoyant mountains. It is important to disclose that all research data and knowledge of Pluto is currently only in hypothesis form. All conclusions drawn from current known data is speculative at best. The data from the New Horizon mission is still being analyzed. There is still much that is unknown about Pluto, and no science, aside from what we know of its atmosphere, is settled.

PSYCHOLOGY: SLEEP AND COGNITIVE RESPONSE

Attitude Change and Galvanic Skin Response when Presented with a Cognitive Dissonance Argument

Alberto Pérez Arroyo | Senior; Psychology with a Concentration in Counseling/Clinical; Cáceres, Spain

Advisor: Dr. Mark Kline, Psychology; Dr. Katharine Snyder, Psychology

The purpose of this study is to assess how reading an argument on a controversial topic, like gun control legislation, that is against the person's beliefs (what is called a state of Cognitive Dissonance), might cause the person's attitude and beliefs to change or, at least, be less radical about that topic. The attitude change and the degree of Cognitive Dissonance will be

measured by using the iWORX equipment for Galvanic Skin Response, which measures the sympathetic nervous system reactivity in relation to the fingertips skin conductance levels. There will also be a pretest-posttest used to analyze participants' attitude, prior to reading the randomly assigned argument either for or against gun control legislation, and after. The study is a replication of the Fidel Castro study on attitude change, when the Cuban Missile Crisis happened, that assessed how people felt about Castro. This study is important because everyone experiences the Cognitive Dissonance state and attitude changes in their daily lives, whether it occurs in informal settings with friends or family, or in formal settings like in a college class.

The Effects of White Noise on Stroop Test Performance

Stephanie Campbell | Senior; Psychology with a Concentration in Clinical Counseling; Rochester, N.Y.

Advisor: Dr. Mark Kline, Psychology

This study focuses on the effect white noise has on Stroop Test performance. The Stroop Test is a classic psychology test where the test taker has to identify the word on the screen, ignoring the color the word is printed in. The hypothesis for this study is that the white noise condition will improve the performance on the Stroop Test. There have been previous white noise studies conducted before that support this

hypothesis. Subjects were randomly assigned to either the white noise condition or the no noise condition. Each subject then took the Stroop Test, and their results were anonymously recorded in the Stroop program used. This research will take place in Trustees 106 in the cubicles within the classroom. Data will be analyzed to see if white noise has a significant impact on Stroop Test performance. If white noise is found to be beneficial to performance, then this information can be used for future test taking, using white noise in the background in order to help students perform better on tests in the classroom. I am doing data collection now and will include my findings in my presentation.

Does Sleep and Anxiety Affect Eyewitness Testimony?

Kayla E. Goldsmith | Senior; Psychology; Manning, S.C.

Advisor: Dr. Mark Kline, Psychology

My research project will be looking at whether or not sleep and stress have an effect on a person's eyewitness testimony. I will populate the project by recruiting psychology students enrolled at Methodist University. Eyewitnesses to crimes are given a line-up of people that may be a suspect. Sleep may enhance the ability to identify the guilty person and not identify the innocent people. Sleep may also impact how reliable

their testimony is. In my research project I will have two groups. Every other person will take the mirror tracing exercise to enhance stress levels while other students will color an image to reduce stress levels. There will be two groups in my experiment: one group will be considered the stress group and the other will not. Both groups will be given the same Epworth sleepiness survey and watch the same video. The prediction is that the participants who have a higher score on the Epworth Sleepiness Scale, and those with higher anxiety, will be at risk of making more mistakes after viewing the crime video.

Authority Levels, Sleep, and the Misinformation Effect

Kyle R. Noddin | Psychology with a Concentration in Human Performance; Hope Mills, N.C.

Advisor: Dr. Mark Kline, Psychology

This research involves observed correlations between the Misinformation Effect, Authority levels, and levels of sleep. Observing this can be so important, because everyone is affected by the Misinformation Effect, and most people never even realize it is happening to them. Before this study began, my hypothesis was that the higher the Authority level the more likely someone was to fall victim to the Misinformation Effect, and

when a low Authority level was experienced, it was also hypothesized that the higher they score on the Epworth Sleepiness scale would increase the likelihood that they would fall victim to the Misinformation Effect. To observe this, the Drew Appleby procedure was used and presented to Psychology classes with different classes receiving differing high and low authority levels represented by a teacher and a fellow student. After they were allowed to hear the words formulated in the Appleby procedure, they were then asked to write down all of the words they could recall. They were then asked to circle yes or no if they heard the word sleep, and finally they were asked to fill out an Epworth's sleep study.

POLITICAL SCIENCE: GLOBAL PERSPECTIVES

Gender Equality and Political Representation: A Global Analysis

Haja Mohamed Nafe | Senior; Political Science with a Concentration in International Relations, Global Studies, and Spanish; Tindouf, Algeria
Advisor: Dr. Andrew Ziegler, Political Science

Over the last few decades, topics related to gender have been highly discussed and investigated. The complexity of the term itself has been challenging to some extent to scholars and researchers. This is a quantitative and comparative study that looks at the factors influencing gender equality in political roles around the world. The research uses a gender equality index to measure gender equality in general in nations, and it also uses the percentage of female ministers as a more precise

measure. Although this study concludes that economic factors have the most influence on gender equality levels, other social and political factors such as education, region, political stability, and the press also have significant impact on gender equality. For the percentage of female ministers, it is the political factors that influence it the most. The press also has a strong effect on female political representation. All the other factors are either moderate or weak when it comes to their influence. Based on the findings and analysis, it seems that female political representation is not an indicator of gender equality. This study will help policymakers to identify the problems that are preventing the achievement of gender equality and tackle them. Since it is a comparative study, state actors can consider following the steps of other nations that have better levels of these life qualities.

Understanding Environmental Policies in the World: The Role of Citizens and Governments

Dwayne Green | Senior; Political Science with a Concentration in Public Administration; Clinton, N.C.
Advisor: Dr. Andrew Ziegler, Political Science

Barely a week goes by where there is not some debate on the state of the world's climate. Some blame the severity of nearly every hurricane, tornado, blizzard, or flood on manmade climate change. This study employed a quantitative analysis of data from 172 countries in order to explore the relationships between governmental types and environmental accountability. The hypotheses all had a major theme that various

types of governments and the actions they take will have an impact on environmental accountability. The major findings were that the more accountable the government (government officials) is to the electorate, then the higher the level of environmental accountability the nation has. All of the factors of government type, economic freedom, region, political rights, rule of law, and effective government tested had a positive influence on environmental accountability. A major factor in whether or not a nation has a high level of environmental accountability is related to the type of government a nation has as well as the level of stability, ability to deliver services, and law enforcement ability of that nation. As environmental groups and citizens around the world seek to promote a cleaner environment, these aspects must be taken into consideration.

Climate Change: Peace and Conflict

Mujahed Aghbar | Senior; Financial Economics, Business Administration, and Marketing; Nablus, West Bank, State of Palestine
Advisor: Dr. Paul Knudson, Sociology

Climate change has tremendous current and future impact on international security, so it is crucial that people view climate change from a holistic perspective, not simply as a temperature raise, and more likely as a world threat. Through better understanding climate change, we can prepare to adapt and reduce its high-risk consequences. This

paper attempts to explain how climate change affects the world's security, and their intersection with the economy, health, peace, and conflict in various countries around the world. The paper also focuses on people's accessibility to resources under climate change, and how security can be a bigger stimulus for developing nations, the lower class, and colonized nations, and how those entities might further lose their security as they are more vulnerable and at higher risk of war. I have used some of my personal experiences in Vietnam, Palestine, and New Zealand, while also using credible sources to support my research.

HISTORY: WITCHES, TAILS, AND POINTY HATS

Salem before the Witch Trials

Sabrina Nausadis | Senior; History with Social Studies Teacher

Licensure; Fayetteville, N.C.

Advisor: Dr. Patrick O'Neil, History

What caused the Salem Witch Trials? What kind of social norms did the hysteria emerge from? The New England justice system kept their people on tiptoes because their punishments could vary according to the nature of their crime. The legal system in New England involved whole communities in investigating sexual crimes that included adultery and fornication. Adultery and fornication were penalized according to the discretion

of the magistrate, and people in the communities were instigated by Puritan judicial law to spy on each other and to report any violation that was against the norms of their society. John Winthrop, a Puritan leader, suggested that the Puritan church ought to focus on collective work among its parishioners, and it was through cooperation that salvation was achieved. Hence, the people's involvement was necessary to report crimes, violations, and anything else that would increase the compliance of the community toward the Puritans' laws. This "faith-based civil code" approach helped and encouraged community piety, but ultimately fueled the Salem Witch Trials.

Did African-American Soldiers Have Tails?: A Study of Inequality Overseas in World War II

Andre M. Emanuel | Junior; History; Landstuhl, Germany

Advisor: Dr. Patrick O'Neil, History

The research shows that the African-American soldiers of War World II were treated better abroad by foreigners than their own white counterparts with whom they fought alongside. When examining stories, letters, and

interviews, I found that African-American soldiers of World War II all had similar experiences overseas. While foreigners treated them like heroes, white American soldiers still imposed their beliefs of inequality, particularly by spreading the pernicious rumor that African Americans have tails. The implications are that, while the rest of the world was questioning Jim Crow Laws, white American soldiers continued to spread the inhumane sentiment of white supremacy.

The Klan in the 1920's: Radical White Supremacists Disguised as Heroes

Leilani Holt | Junior; History with Social Studies Teacher Licensure;

Fayetteville, N.C.

Advisor: Dr. Patrick O'Neil, History

During the roaring 1920's, a time of progressivism and cultural assimilation, many white Americans resented societal vicissitudes and clung to pre-Civil War traditions. Progressing into a movement of forbearance towards non-white reformation, the Ku Klux Klan, by the 1920's, was based on the ideals of Nationalism and Conservatism under

false pretenses. This paper strives to investigate the Ku Klux Klan's self-proclaimed values of nonpartisan patriotism and heroism and the way they defined "American." By exploring the Ku Klux Klan through its own publications in *The Fiery Cross* newspaper, this paper uncovers the fallacy pushed on to the general public, under the guidance of Klan leader, Colonel William J. Simmons, in the 1920's. The Ku Klux Klan of the 1920's were masters of public deception, as a consequence of society's progressive movements tabooing open racial discrimination and hatred. Under the ascendancy of Colonel William J. Simmons, the Klan painted itself as an establishment tasked with defending American honor and integrity based on their own definition of "American."

POSTERS

Detection of Blood Concealed by Paint

Lisa Kasamba | Senior; Applied Forensic Science & Justice Studies; Mbabane, Swaziland

Catia Dombaxe | Junior; Chemistry with Concentrations in Forensic Science and Biochemistry; Luanda, Angola

Advisor: Prof. Mark Vecellio, Applied Forensic Science

Both physical—alternate light sources (ALS) and infrared light sources—and chemical compounds (most commonly Luminol and Bluestar) are employed to check a crime scene for latent blood stains. The purpose of this study is to investigate how effective Bluestar, ALS, and infrared light are in detecting blood under multiple layers of common household paints. Commonly sold drywall particle board will be painted using three of the most commonly sold household paints. Human blood will be projected (impact spatter) or transferred onto several painted drywall samples. The drywall samples will then be painted over with one, two, three, four, and five coats of paint. Each sample will be viewed with ALS using orange,

yellow, and red filters, and infrared light with IR filters. After recording the results with digital photography, Bluestar will be applied and observed. Positive chemiluminescence will be photographed. This research will be beneficial for us and the forensic science/CSI community, since case reports have shown that criminals often attempt to conceal bloodstains using a variety of means, including paint. Our study will add to existing literature involving the use of chemical and physical methods of detecting latent bloodstains under paint. Previous research has shown that all of the methods used in this study have been able to reveal bloodstains under several coats of paint (up to twelve, though the results have been inconsistent). Our study is unique because we will use the most commonly sold paints, which contain both paint and primer. Anecdotal observations suggest that these “paint plus primer” formulations may detract from the ability to detect bloodstains under paint. We aim to present our results in the Methodist University Research Symposium as well as the American Academy of Forensic Sciences annual conference in Anaheim, California. We will also seek publication in one of several forensic science journals.

Determination of Ephedrine and Methylhexanamine in Weight Loss Supplements Using Gas Chromatography-Mass Spectrometry (GC-MS) and Proton Nuclear Magnetic Resonance (H-NMR)

Catia Dombaxe | Junior; Chemistry with Concentrations in Forensic Science and Biochemistry; Luanda, Angola

Advisor: Dr. Stephanie Hooper Marosek, Chemistry

The purpose of this research is to examine and to determine the concentrations of Ephedrine and Methylhexanamine in weight loss supplements. Results will be obtained using Gas Chromatography-Mass Spectrometry (GC-MS) and Proton Nuclear Magnetic Resonance (H-NMR). Ephedrine and Methylhexanamine are compounds that have been banned by the FDA due to their toxicity and negative side effects on human beings. However, many weight loss supplements still contain these compounds because they act as appetite suppressants and block the

absorption of carbohydrates and fat. The findings of this research will help determine if these weight loss supplements are dangerous and should not be sold over the counter. This is a relevant and important topic nowadays because many people adhere to different dietary routines, with a common one involving losing weight quickly or without being physically active. The efficacy of weight loss supplements is questionable, and there are many negative side effects associated with these supplements. Therefore, this study is of great significance due to the large number of people utilizing these unregulated supplements. The target compounds will first be extracted from the weight loss supplements, undergo purification, and finally be analyzed by GC-MS. This method will separate, identify, and quantify any Ephedrine and Methylhexanamine present in our supplement samples. The H-NMR will further be used to identify the presence of these compounds, and the results from both analysis techniques will be used to compare and validate the other.

Allison Hall Computer Rooms

Charles Jacobs | Freshman; Engineering with a Concentration in Industrial & Systems Engineering; Statesville, N.C.

Conan Hooker Humphries | Freshman; Engineering with a Concentration in Industrial & Systems Engineering; Providencia, Colombia

Kalkidan Gebrehiwot | Freshman; Engineering with a Concentration in Industrial & Systems Engineering; Addis Ababa, Ethiopia

Advisor: Dr. Denise H. Bauer, Engineering

An important issue on campus surrounds the layout of the Allison Hall Computer Rooms. Our team of engineers found that the configuration

of the two computer lab classrooms in Allison Hall are not the most conducive to working while the instructor is giving a lecture on the main screen or making a demonstration. From personal experience and the opinions of some of the students, it was determined that the rooms lack proper usage of space. Our main focus will be on organizing the layout of the floor and computer stations so that they might appear more favorable to the students' learning process. Furthermore, we will look into arrangements during events that would allow rooms to be utilized in order to satisfy the needs of the users in an efficient manner. We will survey students and professors in order to gather ideas, and thus, devise potential solutions to the layout and design of the rooms while taking into consideration cost, space, and time required for the project.

POSTERS (CONTINUED)

Cape Fear Valley Medication Return Process Improvement**Alex Kachler** | Senior; Engineering with a Concentration in Industrial & Systems Engineering; Lithia, FL**Themba Shabnagu** | Senior; Engineering with a Concentration in Industrial & Systems Engineering; Mbabane, Swaziland**Advisor:** Dr. Girish Upreti, Engineering

Thousands of patients check in to the Cape Fear Valley Hospital every year, and oftentimes these patients are taking medications, which must be documented. This means that the patients must bring in their medications to be recorded. The hospital is then responsible for keeping these medications in certain situations, and the patients will occasionally not get

their medication returned when they are discharged. The problem is that the hospital has no standardized process for how to hold the medication, so when patients are transferred to different areas in the hospital, there is a chance that the medication will be mishandled. This investigation will use Lean tools such as DMAIC, flow charts, and 5S to standardize a process where the medication can be handled the same way throughout the entire hospital. This will, in turn, reduce the number of patients who leave the hospital without their medication. A standardization will also lead to greater customer satisfaction and increased productivity, since nurses will not have to waste their time looking for medication or re-entering it into their systems. Additionally, there will be less space taken up by forgotten medications, and this will prevent wasted space in crowded hospital storage areas.

Hendricks Science Parking Lot and Sidewalk Flooding**Kit Allman** | Freshman; Engineering with a Concentration in Industrial & Systems Engineering; Colorado Springs, Colo.**LaMont Murray** | Freshman; Engineering with a Concentration in Industrial & Systems Engineering; Bayboro, N.C.**Elijah Cutler** | Sophomore; Engineering with a Concentration in Industrial & Systems Engineering; Cameron, N.C.**Seth Wilson** | Freshman; Engineering with a Concentration in Industrial & Systems Engineering; Columbia, S.C.**Advisor:** Dr. Denise H. Bauer, Engineering

An important issue on campus surrounds the Hendricks Science parking lot and sidewalk flooding. Our group of engineers found that

the Hendricks Science Building seems a little old and worn down from time and use. From personal experience and the opinions of some of the students, Hendricks lacks drainage and proper elevation for water runoff after heavy rains. In addition, the parking lot and sidewalks flood because they are lower than where the water is supposed to runoff and, in some places, there is no drainage. Our main focus will be on understanding the water flow from the parking lot and sidewalk area during rainstorms. We hope changes would allow the Hendricks lot to be utilized to its fullest potential on any given day. We will gather ideas from the various faculty and staff, then form an improvement plan based on the needs of the users, cost of the ideas, allowed space, and how long would it take to implement these ideas.

Longest Nature Trail**Ian Davis** | Freshman; Engineering with a Concentration in Industrial & Systems Engineering; Myrtle Beach, S.C.**Jesse Leyble** | Freshman; Engineering with a Concentration in Industrial & Systems Engineering; Jacksonville, N.C.**Jeremy McNeill** | Junior; Engineering with a Concentration in Industrial & Systems Engineering; Spring Lake, N.C.**Drew Topoly** | Sophomore; Mathematics & Engineering with a Concentration in Industrial & Systems Engineering; Smithfield, N.C.**Advisor:** Dr. Denise H. Bauer, Engineering

Our campus sits close to a city with lots of businesses and roads, but we have nature right in our backyard. The Longest Nature Trail is located at the back of our campus and leads to the Cape Fear River. In 2016, Hurricane Mathew hit the Carolinas and damaged a majority of the nature trail, and since then it has been closed. There has been little to no cleanup done on the trail to make it safe as well as enjoyable. Our plan is to take action to clean up the trail and reconstruct the path itself to make the trail safe to all students, faculty, staff, and the public. Once we have reached our short-term goal of reopening the trail, we hope to implement a long-term plan to keep and maintain the trail so that it might remain open and safe for all who use it.

Parking**Riley Caudle** | Freshman; Engineering with a Concentration in Industrial & Systems Engineering; Lumberton, N.C.**Tyree Brown** | Freshman; Engineering with a Concentration in Industrial & Systems Engineering; Fayetteville, N.C.**Andrew Bradshaw** | Freshman; Engineering with a Concentration in Industrial & Systems Engineering; Orangeburg, SC**Jaquan Hayes** | Freshman; Engineering with a Concentration in Industrial & Systems Engineering; Manhattan, NY**Advisor:** Dr. Denise H. Bauer, Engineering

The problem with the parking lot that this project focuses on revolves around Clark Hall and the Physician's Assistant (PA) building. The PA parking lot is a blue lot, but there are not many parking spots for the students, and this leads to the students parking in front of Clark Hall, which is a red lot for commuters, faculty, and staff for Clark Hall, Trustees, Stout Hall, and Nursing. Since the PA students are taking these spots in the red lot, it then forces others to find parking elsewhere, such as on the other side on the campus near Allison Hall. The main focus for this project is to discuss a solution for more parking in the blue lots for PA/ Health Science students so that there will not be a constant problem of overflow in front of Clark Hall.

POSTERS (CONTINUED)

Patient Flow in Operating Room

Mohammed Mahdi | Senior; Engineering with a Concentration in Industrial & Systems Engineering; Baghdad, Iraq
Busani Mhlanga | Senior; Engineering with a Concentration in Industrial & Systems Engineering; Mbabane, Swaziland
Advisor: Dr. Girish Upreti, Engineering

The wait time for an operation is very critical, as patients are stressed and worried before they enter the operating room. Therefore, the time they spend waiting outside of an operating room is not pleasant. Cape Fear Valley Hospital has a very long wait time, as they bring in patients

about three hours before their operation. We are working with the Quality Improvement department of the hospital on employing process improvement tools such as a Value Stream Map, Spaghetti Diagrams, and Time Studies in order to increase the efficiency of care with the goal to reduce wait time. This will allow us to reduce the wait times by measuring, monitoring, and managing time spent. Moreover, with the analysis of historical data, we are developing forecasting models to predict the number of arrivals in order to be able to prepare for hosting them better. Our target is to bring in patients an hour before, instead of three hours, as this would also increase patient satisfaction.

Pauline Longest Nature Trail

Steven Harris | Freshman; Engineering with a Concentration in Industrial & Systems Engineering; Norfolk, VA
Colby Cox | Freshman; Engineering with a Concentration in Industrial & Systems Engineering; Randleman, N.C.
Sean Coleman | Freshman; Engineering with a Concentration in Industrial & Systems Engineering; Fayetteville, N.C.
Allen Moore | Freshman; Engineering with a Concentration in Industrial & Systems Engineering; Charlotte, N.C.
Advisor: Dr. Denise H. Bauer, Engineering

An important issue on campus is the closure of the Longest Nature Trail. Our group of engineers found that the nature trail would be worth it to clean it up. Most of the people we asked did not even know it existed and their opinions were that they would go on the trail and love to have a place to relax in nature. In addition, the Longest Nature Trail has a historical value to Methodist University. Our main focus will be on cleaning up the trail and fixing the bridges as safely and economically as possible. Furthermore, we will look into arrangements that potentially pay for the repairs and give students a work study. We will gather ideas from the various students and faculty in order to form a plan based on the cost, efficiency, and health.

Reciprocal Walker

Keith Hardie | Senior; Engineering with a Concentration in Industrial & Systems Engineering; Oxford, N.C.
Natasha Ng'ambi | Senior; Engineering with a Concentration in Industrial & Systems Engineering; Lusaka, Zambia
Advisor: Dr. Denise H. Bauer, Engineering

Our goal is to design and fabricate a reciprocal walker that naturally inspires reciprocal motion between the arms and legs, particularly for individuals who have suffered a stroke. This will be a proof-of-concept prototype for a walking assist machine that facilitates the rehabilitation of stroke patients back to a natural gait. For this to be possible, we have found that it is crucial to emphasize the reciprocal motion between the arms and legs in order to reestablish neural pathways associated with a natural gait.

We will be working on an interdisciplinary team consisting of 4 members: 2 engineering undergrads and 2 occupational therapy graduate students. On this team, we will develop and evaluate multiple designs using the V-Model for product design and ergonomic concepts. These designs will then be modeled in Solidworks, a 3D modeling program, before we attempt to construct a functional prototype. Through this project, we hope to gain valuable experience designing products around the people for which they are intended, applying Human Factors principles to develop a more functional technology for stroke patients. If we are able to successfully accomplish the full design and prototyping of our product, we will then test the product for its rehabilitative success by working with connections made by the Occupational Therapy Program, allowing actual stroke patients to utilize and evaluate the product.

Cramer's Rule and its Application to an $n \times n$ Matrix System

Hamza Boubacar Kassomou | Junior; Mathematics & Engineering with a Concentration in Industrial & Systems Engineering; Niamey, Niger
Advisor: Dr. Kathleen Fick, Mathematics

The purpose of this poster is to give a basic demonstration of Cramer's Rule in the case of a system of equations with three unknowns, and to state and demonstrate Cramer's Rule in the general case of a system of n

equations with n unknowns by using the general theory of determinants. Gabriel Cramer (1704-1752) first stated his famous Rule which carries his name in 1750, while he was working on determining how many points define an algebraic curve. The rule is particularly efficient in solving systems of equations with two or three unknowns. In this poster, the time complexity of Cramer's rule in solving systems of equations with more than three unknowns will also be explained, along with a brief survey of Gabriel Cramer's contributions to the analysis of lines of algebraic curves.

POSTERS (CONTINUED)

Fibonacci Sequence and Numbers**Felipe Bautista** | Senior; Mathematics; Four Oaks, N.C.**Advisor:** Dr. Kathleen Fick, Mathematics

This poster presentation will describe the natural phenomenon of the Fibonacci Sequence. The topic as to whether mathematics was invented or discovered is a question many mathematicians discuss. Ultimately, many have concluded that without one or the other (invented or discovered), our understanding of mathematics would not have evolved to where it

is today. Fibonacci numbers arise in our daily lives, such as in nature, pictures, music, and more. The further you explore these numbers, the more interesting they become. The golden ratio is derived from following a pattern within the Fibonacci numbers and is one that architects, as well as artists, have used. What is interesting is that Fibonacci found this connection while wandering around the Mediterranean observing currencies for commerce. Even his depiction of a rabbit population occurred in Fibonacci fashion. What else lies ahead remains a mystery for many mathematicians as we wonder where else does this sequence occur?

L'Hôpital's Rule**Kelby West** | Senior; Mathematics; Beaufort, N.C.**Advisor:** Dr. Kathleen Fick, Mathematics

This poster presentation will describe L'Hôpital's rule, the historical development, and how it allows mathematicians to evaluate particular

limits using concepts of limits as well as derivatives. The work of Bernoulli and L'Hôpital will be shared, portraying how this rule is used to find the limit of a function in an indeterminate form. Several examples will help show the different cases in which this rule is employed, essentially manipulating a function so that it may be evaluated.

The Four Color Problem**Aiden Sherry** | Junior; Mathematics & Engineering with a Concentration in Industrial & Systems Engineering; Fairfax, Va.**Advisor:** Dr. Kathleen Fick, Mathematics

This poster presentation will discuss the Four Color Problem as well as its history. The Four Color Problem is an attempt to find the minimum

amount of colors needed to color any map where no adjacent regions have the same color. The Four Color Problem was first introduced in 1852 and was not solved until 1976, which makes for an interesting history full of twists and turns, counterexamples, and false proofs. The controversy surrounding the Four Color Problem will also be discussed since some mathematicians still consider the problem to not be solved.

Trigonometric Functions**Yitong Zhang** | Junior; Mathematics; China**Advisor:** Dr. Kathleen Fick, Mathematics

This poster presentation will introduce the trigonometric functions and shed light on their historical development. I have used trigonometric

functions regularly in my Calculus and Physics courses, but I was not aware of their history. What did these trigonometric functions look like when they were first determined, how were they evaluated, how were they used, and who can be credited with their origins? These are all questions I hope to address in my poster presentation.

Venn Diagrams**Wade Jackson** | Sophomore; Mathematics; Wake Forest, N.C.**Advisor:** Dr. Kathleen Fick, Mathematics

This poster presentation will portray the origin, uses of, and historical development of Venn diagrams in abstract mathematics. In general, a Venn diagram is used to compare things. In mathematics, they are used to

think through and depict how items actually relate to one another within a particular concept. Created by John Venn, Venn diagrams help students visualize the components of multiple concepts and encourage good organizational and classifying skills. Another main purpose of a Venn diagram is to reason through the logic behind mathematical statements or equations like Boolean logic, or the use of "or" and "and" statements and how they are visually displayed.

POSTERS (CONTINUED)

Biomechanics during Lower Extremity Functional Tests in Female Collegiate Athletes Related to Knee Valgus

Sierra Swasey | Senior; Exercise & Sport Sciences, Fayetteville, N.C.
Advisor: Dr. Amanda Ransom, Physical Education & Exercise Science

Measuring landing biomechanics during the single hop test provides valuable injury information on the anterior cruciate ligament (ACL). The chair to single leg box landing is not a common lower extremity test that is studied. However, this test eliminates the stretch shortening cycle, which may alter the peak force found in the knee along with rotation. A forward jump with a single leg landing motion targets the stabilizer muscles to activate along the tibiofemoral joint in order to decrease valgus. The purpose of this study was to compare lower extremity biomechanics during different functional landing tasks in division III

collegiate athletes. 9 division III female (age: 19.89 ± 1.20) collegiate soccer players (BMI of 22.2 ± 2.04), with no history of ACL injury, performed five different functional jumps. A 3D motion capture system was used (Vicon, Centennial, Colo.) to collect kinematic data. Preliminary results found no significant differences between variables of interest between the tasks. However, the following results are trending towards significance. Average knee rotation during the box single leg landing jump was 29.4° compared to the chair jump single leg landing which was 37.3° . At landing, knee flexion had a max of 78.42° in the box jump and 88.42° in the chair jump. The preliminary results of this study found that it is possible that the demand of the task was not great enough (22 cm box height) to elicit significant kinematic differences, especially given our subject demographics (collegiate athletes).

Knee Extensor Torque and Muscle Activity Differently Relate to Landing Strategies in Female Collegiate Athletes

Nathan Whicker | Senior; Exercise & Sport Sciences; Fayetteville, N.C.

Sierra Swasey | Senior; Exercise & Sport Sciences; Fayetteville, N.C.
Advisor: Dr. Amanda Ransom, Physical Education & Exercise Science

Previous research has found female athletes are 2-6 times more likely to tear their ACL than their male counterparts. Numerous risk factors have been identified, including landing biomechanics and neuromuscular imbalances such as leg dominance and unbalanced hamstring to quadriceps ratio. Previous research has mainly focused on drop-vertical jump, stop jump, and cutting tasks. Little research has been conducted on the chair to box jump, which eliminates the stretch shortening cycle thus changing force production. The purpose of this study was to assess

the differences in lower extremity muscle activity using different take off techniques in single leg landings. 9 Division III females (age: 19.89 ± 1.2) with no history of anterior cruciate ligament (ACL) injury, performed a chair jump and box jump task. A 3D motion analysis system was used to collect kinematic data and kinetic data was collected using 4 Bertec force plates (Bertec Corporation, Columbus, Ohio). Electromyography (EMG) data was collected with a Delsys Trigno 16-channel system (Delsys Inc, Boston, Mass.) and a hand held dynamometer (Lafayette Manual Muscle Tester, Watkinsville, Ga.) measured force production. There were no kinematic differences between the functional chair jump and box jump tests. The EMG data and the force data are currently being analyzed. Hamstring strength protects the ACL by decreasing tibial translation and strain on the ACL. Female athletes should begin a type of exercise programming that allows for more hamstring strengthening.

Comparing Muscle Activation Sequence and Force Production during Sumo and Conventional Deadlifts

Nicholas Lee | Senior; Exercise & Sport Sciences; Fayetteville, N.C.
Michael DeWitt | Senior; Exercise & Sport Sciences; Spring Lake, N.C.
Kevin Hall | Senior; Exercise & Sport Sciences, Elma, WAWashington
Advisor: Dr. Amanda Ransom, Physical Education & Exercise Science

The deadlift is a multi-joint movement that involves picking up a weighted barbell from the floor and standing up to an upright position. This movement includes muscle activation of mainly the spinal erector and surrounding muscles, the quadriceps, hamstrings, and abdominal muscles. The purpose of this study is to examine the differences between the sumo and conventional deadlift. Kinematics will be collected on 10 participants with 14 Vicon Bonita 10 cameras (Vicon, Denver, Colo.), at a rate of 200Hz, and kinetic data will be collected with 4 Bertec force

plates (Bertec Corporation, Columbus, Ohio), to calculate forces during each lift. Electromyography (EMG) data will be collected using Delsys Trigno 16-channel system (Delsys Inc, Boston, Mass.). Previous studies have shown that Sumo deadlifting requires more hip and gluteal strength whereas conventional deadlifting requires more hamstring and lower back strength. The data will be compared to identify if any significant differences exist between the sumo and convention deadlifts. The differences that we expect are that the sumo deadlift uses primarily the vastus lateralis and medialis, the spinal erectors, the gluteus maximus, and the semitendinosus. We believe that the main difference lies in percentage of the activation of the spinal erector and gluteus maximus muscles for power. The big picture of this study is to give us a breakdown of the movement by muscle percentages and power production, allowing us to tailor workouts for athletes.

POSTERS (CONTINUED)

Exercise and Literary Reading Comprehension: An Alternative to Sedentary Studying**Jack O'Malley** | Junior; Psychosocial Aspects of Sports & Coaching; Sarasota, Fla.**Advisors:** Dr. Jamie Robbins, Psychosocial Aspects of Sport & Coaching; Dr. Cameron Dodworth, English; Dr. Stacia Britton, Physical Therapy

The positive health effects of physical activity (i.e. decreases in obesity, diabetes, cardiovascular disease, LDL cholesterol, and blood pressure) are commonly known, yet many individuals engage in less than recommended amounts of physical activity per week, and a great deal of sedentary behavior. Of particular interest is the prevalence of sedentary behavior among college students, who have outlets for physical activity (i.e. gyms, trails etc.), but spend many hours sitting in class, studying and doing homework. To therefore, improve health and academic performance alternative ways of engaging in these behaviors may be necessary. The purpose of the current study was to identify whether riding a stationary bike while reading positively or negatively impacted reading comprehension and if dynamic visual acuity (DVA) factored

into results. Twenty-four female (n=18) and male (n= 6) college students participated in the study. Seventeen self-reported being active or very active. Participants completed a demographic survey and a DVA test prior to testing. An experimental design was used to assess differences in reading comprehension while reading on a stationary bike and sitting in a chair. Participants completed each trial and then answered open-ended questions. The test of comprehension was created to assess literary interpretation, not just basic understanding to more effective match requirements of collegiate English courses. Scores were generated using a 70-point grading rubric. Further analysis included a mixed-models ANOVA, examining the effect of activity, athletic status, age, DVA, literary excerpt, and exercise vs. non-exercise on reading comprehension (total scores from the reading tests). Participants who were already highly active scored slightly higher on the non-exercise condition, but no statistically-significant differences were noted as a result of DVA score or trial type. Findings showed that riding a stationary bike while reading a literary excerpt did not negatively impact reading comprehension among this group of participants and thus may be a good solution for decreasing sedentary behavior among non-active college students.

Shot Speed and Accuracy for Men's Lacrosse: Overhead, Sidearm and Underhand Shots**Dakota Gross** | Sophomore; Psychosocial Aspects of Sport & Coaching and Applied Sport Psychology; Fuquay-Varina, N.C.**Hunter Vaughan** | Sophomore; Psychosocial Aspects of Sport & Coaching, Occupational Therapy; Apex, N.C.**Advisor:** Dr. Jamie Robbins, Psychosocial Aspects of Sport & Coaching

There are three common shots in lacrosse: overhead, sidearm, and underhand. Research looking at the effectiveness of these shots is limited. Therefore, the purpose of this study was to assess the speed and accuracy of each shot among DIII collegiate male lacrosse players. Twelve participants (ages=18-22) who play offensive positions participated in the

study. To best replicate environmental conditions and increase the validity of the testing scenario, participants took shots on a real lacrosse goal on a lacrosse field. Athletes shot for accuracy, five shots per technique, to a target in each corner of the goal, with breaks in between each technique. They then shot three shots, using each technique, at the center of the goal for speed, which was measured using a radar gun. Overall shot accuracy was 23.3 percent for all shot styles combined. The average speed for all shots was 80.68 miles per hour. No significant differences were identified based on technique for either speed or accuracy. However, results did reveal sidearm shots to be fastest and underhand shots the slowest. Furthermore, athletes averaged greater accuracy for underhand and sidearm shots when compared to overhead. A full explanation of findings and their implications will be addressed.

Case Analysis from Anne Chesnutt Middle School**Serena Harper-Smith** | Senior; Social Work with a Concentration in School Social Work; Markham, Ill.**Advisor:** Prof. Tracey Hinds, Social Work

I chose to do my Case Analysis on an 8th grade student from Anne Chesnutt Middle school. This student was appointed to me by the school social worker due to what they have endured throughout their middle school career. This student is a white male and has been battling severe depression to the point where he is on medication, such as antidepressants. Over the course of his middle school career the student has experienced

several major life-altering events which contributed to his depression. The most major event was the passing of his mother at the end of 7th grade. He is now living with his grandmother, who is elderly and she says that he has been out of tune with his emotions, but she is unsure as to whether it is because of the medication that he is prescribed, which makes him numb, or if it is because he has lost hope. I meet with this student every week just to see his progress, and as of now it has been suggested to have him work on his schoolwork during his electives, as therefore he can make up his assignments and pass the 8th grade. Goals will be established using SMART Goals methods.

POSTERS (CONTINUED)

Case Analysis from Connections of Cumberland County

Lakeshia Holmes | Senior; Social Work; Statesville, N.C.

Advisor: Prof. Tracey Hinds, Social Work

An African-American separated mother has lost her home and her belonging in a fire. She and her seven children are now living in a shelter. Their ages are 13, 12, 10, 8, 6, 4, and 3. The mother is currently diagnosed with severe anxiety, depression, Post Traumatic Stress Disorder (PTSD), and asthma. She has a history of domestic violence, as well as physical, emotional, and sexual abuse. Before the fire, the client was working at a plasma center, but was not scheduled many hours due to having no

child care. She came into Connections of Cumberland County (CCC) needing assistance with affordable housing, clothing, food, childcare, and counseling/mentoring for her oldest two children, particularly in regards to an altering in their behaviors after the house fire. She was recently denied for TANF through the Department of Social Services (DSS), but she does receive \$1276 from the Supplemental Nutrition Assistance Program (SNAP) and Medicaid for both herself and her children. She also receives \$950 from her husband's monthly income. Her total monthly income amount is \$2,536. An assessment and goals update will be provided to show how interns work with the client.

Case Analysis from Fayetteville Area Operation Inasmuch

Gregory Sampson | Senior; Social Work; Newport News, Va.

Advisor: Prof. Tracey Hinds, Social Work

This presentation is based on a case analysis from a social work student's experience as an intern at Fayetteville Area Operation Inasmuch, engaging with a client within the Lodge Program. During the presentation, the client's family history, initial issues, his goals, and other demographic

information of the client will be discussed. An analysis of the client's problem will be explored, detailing the specific issues and situations the client is dealing with. A description of the strengths of the client as well as the limitations to solving the problem pertaining to the case will be discussed. The work I have conducted with the client, the programs the client is enrolled in, and the interventions implemented will be detailed. Also, my experience with working with this case will be described along with the difficulties faced by an intern.

Case Analysis from Fayetteville Urban Ministry

Joshbekashah Morris | Senior, Social Work; Hampton, Va.

Advisor: Prof. Tracey Hinds, Social Work

This is a case analysis from a Methodist University Social Work Student's experiences. This case study will provide a history of the client, family, and systems of care, as well as introduce Fayetteville Urban Ministry to readers. The client, the intern, and the agency will set goals and use academic progress reports, electronic communication with parents, client's case notes, and practitioner observations in order to evaluate the effectiveness of goals. The impact of autism on the client's systems (home, school, social) will be studied and discussed. FAF's staff members utilized the Behavioral Rating Profile Second Edition (BRP-2) and Culture-Free

Self-Esteem Inventories-Third Editions (CFSEI-3) in order to assess the client's self-esteem and his ability to function in his social environment. The Interpersonal Skill Workshop and tutoring services will be the primary interventions utilized in this case analysis, where the student will discuss the current impact of interventions implemented in the client's helping process. The client's biopsychosocial responses to the interventions will be discussed, as well as how those responses are assisting or enabling the services provided. This case analysis will present and discuss two visual representations (an ecomap and a genogram) of the systems and relationships in the client's life. The case analysis will discuss the strengths and the limitations the client possesses, and the relevant effect on the client's well-being and services provided.

Case Analysis from Fayetteville Urban Ministry Find-a-Friend

Julie Lucas | Senior; Social Work; Hope Mills, N.C.

Advisor: Prof. Tracey Hinds; Social Work

This study explores the case of a 14-year-old girl who has some behavioral and academic difficulties. She comes from a single-parent home and lives in an impoverished neighborhood. She also has difficulty getting along with her siblings and stepdad. This young girl scores below her grade level in reading and math. Therefore, an establishment of goals will focus on academic improvements and social skills building. A Specific, Measurable, Achievable, Realistic, and Time-based (S.M.A.R.T.) goals

method will be used to establish goals. The establishment of goals will occur in partnership with the client and will be modified as needed. The client and this social work intern will meet once weekly to assess progress. During weekly sessions, an evaluation of home life as well as of school life are discussed for referral to additional community services, as needed. Through the one-on-one intervention sessions, the preferred goal is to increase this student's overall success in school. Throughout this process, consultation with the Interpersonal Skills Case Manager is ongoing. This is a case analysis of one individual child's progress in the Find-A-Friend Program. The name and personal information is changed to protect the client's identity. For the purposes of this paper and presentation, the client's name is Madison.

POSTERS (CONTINUED)

Case Analysis from The Care Clinic**Kandus Fulmore** | Senior; Social Work; Fayetteville, N.C.**Advisor:** Prof. Tracey Hinds, Social Work

This poster gives an analysis of The Care Clinic. The author of this poster will identify all services and functions of the care clinic. The available resources for individuals who are in need are limited. The care clinic offers a variety of services to surrounding counties' residents depending on their eligibility. Individuals in the community will benefit from the services that are offered. The agency offers services to the public, but also one must remind themselves that it is important to understand the funding, mission, and personnel. The purpose of this assignment is to give an understanding of the agency from a macro system approach. The goal, mission, and objectives will be explained. A thorough analysis of The Care Clinic will be provided to give an understanding of how the

agency functions in its entirety. The clinic consists of a medical side, and a dental side. The medical side has a different doctor that comes into the clinic to volunteer each night from surrounding hospitals. The dental side has dentists from their own private practices or local hospitals to serve. The clinic has a variety of nurses that also volunteer. They come from different hospitals and clinics. Some of the nurses are retired and volunteer to keep skills and licenses valid. The clinic has two on-staff nurses that are paid employees. The clinic is well organized and runs on a smooth system. The mission statement of the clinic is to provide free quality health care to uninsured, low-income adults that live in Cumberland County and the surrounding areas, and to also be a force for a healthier community. The mission is being fulfilled one person at a time. Each volunteer has love and compassion, and wants to serve the community. The community of Cumberland County has a great need for more free or low-cost health facilities.

Case Analysis of Guardian Ad Litem Child**Kiara Brown** | Senior; Social Work; Atlanta, Ga.**Advisor:** Prof. Tracey Hinds, Social Work

The Guardian Ad Litem (GAL) agency advocates for abused and neglected children in the courts, so that the children do not have to attend court and represent themselves. The Guardian Ad Litem assesses each child in order to advocate on their behalf. The Guardian Ad Litem on the case is Kiara Brown, an Interning Senior Social Work Student at Methodist University. This case study will highlight a 10-year-old African-American

child named Mayelle. Mayelle became a part of the Guardian Ad Litem agency on September 24th, 2013, due to abuse and neglect by her mother's boyfriends. Mayelle has been diagnosed with Disruptive Mood Deregulation Disorder, Attention Deficient Hyperactive Disorder, and Oppositional Defiant Disorder. Mayelle has not had contact with her birth mother since being removed from her care in 2013. Mayelle is also not allowed visitations with her older brother. However, she is allowed to have visits from and phone calls with her father. A complete Assessment will be conducted on the minor child.

Case Analysis on Making Proud Choices! as presented by Teen Connections, in partnership with Planned Parenthood**Jessica Moretz** | Senior; Social Work; Sanford, N.C.**Advisor:** Prof. Tracey Hinds, Social Work

Making Proud Choices! is an evidence-based prevention program which includes a focus on the reasons and strategies used to delay sexual

initiation, as well as the skills for defining personal goals, negotiating safer sex, and correctly using contraceptives, including condoms, in an effort to reduce teen pregnancy and sexually-transmitted diseases. It is targeted at middle school African-American, Hispanic, and White adolescents. Heather Williams, the Community Health Educator for Teen Connections, in partnership with Planned Parenthood, will assist Jessica Moretz in the preparation of the information for the presentation to ensure fidelity.

Food Insecurity: Hunger for an Education**Fredlisha Lansana** | Senior; Social Work; Fayetteville, N.C.**Advisor:** Prof. Tracey Hinds, Social Work

Food Insecurity is common at colleges and universities across the country, potentially undermining the educational success of an untold thousands of students. Given its potential impact, the collective understanding of this issue is far too limited. The existing studies on campus food insecurity have almost exclusively looked at individual colleges and university systems, or focused on community colleges. In order to expand the understanding of campus food insecurity, my goal was to get a good sample of the Methodist University population in order to foster a more expansive understanding of the topic and the effect that it has on our students here at Methodist University. My sample included 60 individuals

with the following classification; 8.67 percent student veterans, 0.67 percent international, 7.33 percent night students, 20 percent day students, 35.33 percent commuters, 1.33 percent residential, 0.67 percent staff, 6.67 percent graduate students, and 19.33 percent undergraduates. 32.2 percent of those surveyed shared that they are affected by food insecurity with at least 12.82 percent sharing that they experience this at least twice a week, and 43.59 percent of those affected specifying probably more regularly than twice per week. 42.62 percent of our students surveyed feel they are not performing as well academically because of food insecurity, 18.03 percent are missing class because of hunger, and 4.92 percent of those surveyed would have to choose between eating and purchasing required textbooks. This issue has a negative impact on the educational experience on college campuses all across the country. How can we expect our students and counterparts to focus if their basic needs are not being met?



AN UPDATE FROM THE CENTER FOR RESEARCH AND CREATIVITY
Dr. Cameron Dodworth, Director

The 2019-2020 academic year was on pace to be a record-breaking benchmark for the Methodist University Center for Research and Creativity. The portion of the CRC annual budget reserved for funding student research/creative projects and research/creativity-related student travel was used up by January, and a record number of undergraduate and graduate students were scheduled to present their research and creative projects as posters and oral presentations in the Ninth Annual Center for Research and Creativity Symposium on April 1, 2020.

However, by the Monday after Spring Break, March 9, 2020, developing world events related to the coronavirus, COVID-19, appeared poised to disrupt the daily lives of those of the Methodist University campus and community, along with the rest of the United States of America, and much of the rest of the world. Later the following week, Methodist University classes were put on hiatus, and by Monday, March 23, 2020, all in-person Methodist University classes had been transitioned into online classes, the campus was almost completely shut down, and the 2020 Symposium was therefore officially canceled.

While a potentially record-breaking year transitioned into a tumultuous, disappointing, and even tragic year during the spring of 2020, the administration, faculty, and staff of MU worked to salvage as much of the 2019-2020 academic year as they could for MU students, given the circumstances. A byproduct of this effort is the present form of the Ninth Annual CRC Symposium, which appears before you in digital/virtual form. Out of a show of support for the MU students that were unfortunately unable to present their work in a live format, please peruse the research and creative materials listed in this program and uploaded to the CRC website, in the form of written documents, as well as audio/visual presentations.

The MU CRC sincerely thanks you for doing so, and we also thank Doo Lee (MU Graphic Designer & Campus Photographer) and Michael Molter (MU Webmaster & Blackboard Administrator) for the extra work that they put into making these materials available to you in this online format.

