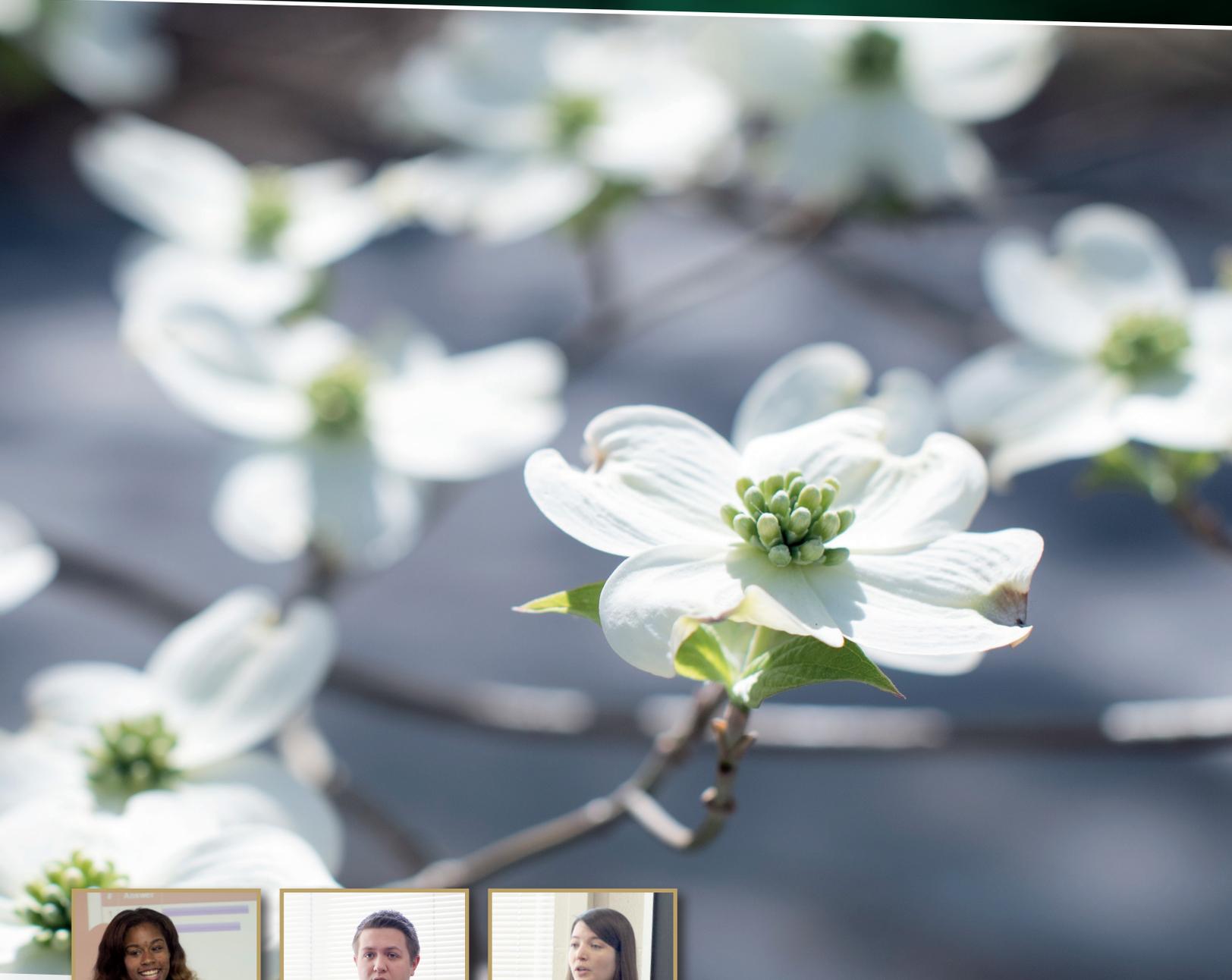


THE SIXTH ANNUAL  
UNDERGRADUATE RESEARCH  
AND CREATIVITY SYMPOSIUM



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## MISSION STATEMENT OF THE METHODIST UNIVERSITY CENTER FOR UNDERGRADUATE RESEARCH AND CREATIVITY

The mission of the Methodist University Center for Undergraduate 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.

“One of the highlights of the academic year is the Undergraduate Research Symposium and related activities that involve our undergraduate students, graduate students, and faculty. It places emphasis on scholarly endeavors, and showcases the collaborative work within our University community.”

– Dr. Ben E. Hancock, Jr.  
President

“I am pleased that Methodist’s Center for Undergraduate Research and Creativity encourages students and faculty to collaborate on research and creative endeavors. Faculty enjoy mentoring their students, helping students prepare for graduate school and successful careers.”

– Dr. Delmas S. Crisp, Jr.  
Executive Vice President

**WEEK AGENDA | APRIL 3 – 7, 2017**

Monday   April 3		
11:00 – 11:50 a.m.	Faculty Presentations	Locations vary
5:30 – 8:00 p.m.	The Fourth Annual Graduate Research Symposium	PA Auditorium
Tuesday   April 4		
7:00 – 8:30 p.m.	Emerging Voices: A Poetry Reading by the Students of WRI 3250	PA Auditorium
Wednesday   April 5		
8:45 a.m. – 3:30 p.m.	The Sixth Annual Undergraduate Symposium	Locations vary
3:30 p.m. – 5:00 p.m.	University Awards Ceremony	Huff Concert Hall
Thursday   April 6		
7:30 p.m.	The 5th Annual Cape Fear New Music Festival concert, “Music and Improvisation: The Song Does Not Remain the Same”	Hensdale Chapel
Friday   April 7		
11:00 – 11:50 a.m.	Faculty Presentations	Locations vary



**CURC SYMPOSIUM AGENDA | APRIL 5, 2017**

Time	Event	Location
9:00 – 10:00 a.m.	Morning Session	See program for locations
10:00 - 11:00 a.m.	Panel Discussion: Completed, Ongoing and Future Research in Sports Science and Wellness	H112
11:00 – 11:50 a.m.	Chapel: “The United Methodist Church and Human Sexuality: Moving Forward in Unity” by Chantal M. Abbuhl	Hensdale Chapel
Noon – 12:45 p.m.	Lunch	On your own
1:00 – 2:00 p.m.	Special Presentations: “Cape Fear New Music Festival Concert” ◆ 1 p.m.   “Sport and Improvisation” Dr. Kyrstin Krist ◆ 1:30 p.m.   “Poetry and Improvisation” Prof. Shannon Ward	Reeves G5
2:00 – 3:30 p.m.	Afternoon Session	See program for locations
2:30 – 3:30 p.m.	Poster Session	Berns Student Center
3:30 – 5:00 p.m.	University Awards Ceremony	Huff Concert Hall



# MUSIC AND IMPROVISATION

CAPE FEAR  
NEW MUSIC  
COM  
Thursday,  
APRIL  
SIXTH  
2017

7:30 PM

featuring NEW compositions by...

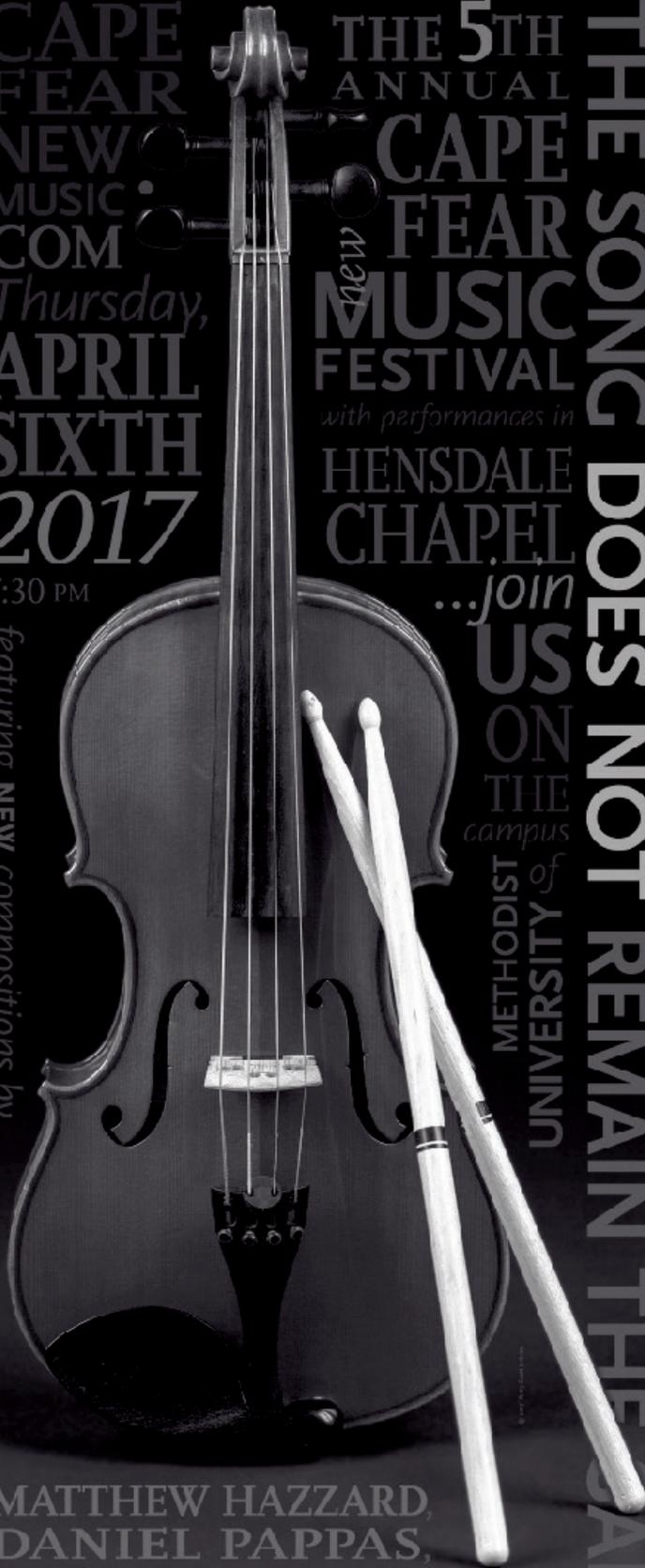
MATTHEW HAZZARD,  
DANIEL PAPPAS,  
KEITH DIPPRE,  
DANIEL McCLOUD,  
and KEVIN AUSTIN

THE 5TH  
ANNUAL  
CAPE  
FEAR  
NEW MUSIC  
FESTIVAL  
with performances in  
HENSDALE  
CHAPEL

...join  
US  
ON  
THE  
campus  
METHODIST  
UNIVERSITY



# THE SONG DOES NOT REMAIN THE SAME.



## THE 5TH ANNUAL CAPE FEAR NEW MUSIC FESTIVAL CONCERT

“Music and Improvisation: The Song Does Not Remain the Same”

Thursday, April 6, 2017 | 7:30 p.m.  
Hensdale Chapel

### Special Presentations

April 5 | 1:00 - 2:00 p.m. | Reeves G5

- ◆ 1 p.m. | “Sport and Improvisation”  
by Dr. Kyrstin Krist
- ◆ 1:30 p.m. | “Poetry and Improvisation”  
by Prof. Shannon Ward

## MORNING SESSION

## Accounting, Business, and Study Abroad | Alumni Dining Room

9:00 - 9:20 a.m.	The Tax Gap: An Empirical Analysis of Less-Explored Factors	Abigail Bird
9:20 - 9:40 a.m.	Do Students Really Learn While Studying Abroad: An Analytical Approach Using Data Collected from Guatemala Study Abroad	Sinath Keo, Adam Hickerson
9:40 - 10:00 a.m.	Beyond Borders: Students' Cultural and Business Experience from China	Laura Allred, Rachael Carlton, Jason Pfannschmidt, Nicholas Murn, Christopher Naiberk, James Ammons, Breanna Frazier, Heyi Gong

## Math and Chemistry | Hendricks 122

9:00 - 9:20 a.m.	The Relationship Between Primes and Consecutive Integers	David Shane, Safar Adam Kurbansho
9:20 - 9:40 a.m.	Separatory Analysis of Acetic Acid in Sports Drinks and Food Products and its Role in Exercise-Associated Muscle Cramp Relief	Katayoon Dowlatshahi

## Literature and Music | Hendricks 222

9:00 - 9:20 a.m.	A Gender-Bound Domain in Teotitlán del Valle: The Evolving Roles of Zapotec Women	Cheri D. Molter
9:20 - 9:40 a.m.	The Archpriest of Hita: Sinner or Human?	Lindsey Pritchard
9:40 - 10:00 a.m.	Bagpipes: The Social Journey of a Unifying Instrument and its Effect on Catholic Church Music	Hannah Boyles

## Leadership Panel | Nursing 103

9:00 - 10:00 a.m.	The Psychology of Choosing a Leader	Erin Arauz
	Leadership Passed Down Through the Generations	Kylie Arauz
	The Shift of Leadership Skills from Generation to Generation	John R. Estle

## AFTERNOON SESSION

## Psychology | Alumni Dining Room

2:00 - 2:20 p.m.	The Impact of Sleep and Emotional Content on Learning Efficiency	Alexis Patterson, Taylor Hales, Shamar Johnson
2:20 - 2:40 p.m.	The Impact of the Defendant's Physical Attractiveness on Mock Juror Estimates of Criminal Culpability	Cynthia Newby, Rocio Serna, Lydia Werhmann
2:40 - 3:00 p.m.	The Physiology of True, False, and Internalized False Confessions	Taylor Porter, David McNeil, Kristina Turner, Ashley Dittmar
3:00 - 3:20 p.m.	Effect of Body Posture and Situational Interest on Working Memory	David Doss, Pauling Bynum, Amanda Pulliam

## Computer Science | Hendricks 122

2:00 - 2:20 p.m.	vbsDB: The Use of Databases to Organize Students	Alexander Hamilton
2:20 - 2:40 p.m.	Symba: Know Your Campus	Chittachone Elvin Bounphengsy, Vincent Awong-Cole
2:40 - 3:00 p.m.	DevTracker: Software That Improves Overall Developer's Productivity	Davor Pranjić
3:00 - 3:20 p.m.	Additional time for questions with student presenters	

# PRESENTATION SCHEDULE

## AFTERNOON SESSION (CONTINUED)

### Honors Program Panel (Order subject to change) | Hendricks 222

2:00 - 3:20 p.m.	Vaccines and Herd Immunity: The Clash of Individual Freedom and the Social Good	Tatum Kram
	Empathic Management	Danielle Burns
	Compassion	Sheryl Brock
	War for the Roses	Christopher Miller
	<i>The Analects</i> and Economics	Nomcebo Vilane

### Social Work, Sociology, and Health Care Administration | Nursing 103

2:00 - 2:20 p.m.	Uplifting Ethiopian Farmers from Poverty	Marta Tizazu Getahun
2:20 - 2:40 p.m.	Will Ethiopia Overcome Malnutrition?	Marta Tizazu Getahun
2:40 - 3:00 p.m.	Generation Z Attitudes About the Cost of Higher Education	Cheryl Harris
3:00 - 3:20 p.m.	Healthcare Systems Response and Actions Before Epidemiological Emergencies	Elvin Espinoza

## POSTER SESSION

Posters will be on display beginning at 9:30 a.m. in the Berns Student Center. Students will stand by their poster between 2:30 - 3:30 p.m.

Sympathetic Denervation Significantly Modifies the Skeletal Muscle Transcriptome	Meaghan O'Meara
Green and Gold Dining Room Evaluation	Mohammed Mahdi, Samson Demeke Gizaw, Brandon Hunt
Traffic Flow in the Berns Area	Natasha Ng'ambi, Alexander Kachler, Alfredo Midence Ordonez, Raysean Myers
Parking on Methodist University Campus	Keith Hardie, Malik Jenkins, Obaida Zeino, Tyler Beyel
A Parking Resolution for Methodist University	Tanner Blevins, Thembela Shabangu, Elizabeth Belvin, Bryce Kephart
Congestion in the Lion's Den	Busani Mhlanga, Endashaw Tonja, Jeff Williams
The Intersection of Race and Justice	Rebecca Elliott, Javen Henry, Michael Johnson, Aaron Borden, Travon Scott
The Influence of Movement History on Mass-Spring Like Behavior	Emir Nazdrajic, Troy D. Piorkowski

### Internship Posters

Pandora Jewelry Americas Headquarters	Alyssa Like
Richmond Flying Squirrels	Amber Bayton
N.C. Museum of Natural Sciences	Faith Bowen
Duke Talent Identification Program (TIP) Summer Experience	Daniel Sasfy

## MORNING SESSION | ACCOUNTING, BUSINESS, AND STUDY ABROAD ALUMNI DINING ROOM

9:00 – 9:20 a.m.

### The Tax Gap: An Empirical Analysis of Less-Explored Factors

**Abigail Bird** | Junior; Accounting with a minor in Financial Economics and Business Administration; Detroit, Mich.

Advisors: Dr. Pam Strickland & Dr. Matt Dobra

The tax gap is defined as the difference between the tax revenue that a government believes it is supposed to collect and the tax revenue that is actually collected. Scholars and policy makers have long studied the international differences in taxation, particularly with respect to how the tax gap might be reduced. For example, one common suggestion to reduce the tax gap is to increase funding or staff (or both) allocated to tax recovery administrations.

This study will examine two issues. First, this study will analyze international archival tax data from the Organization for Economic Cooperation and Development to investigate if

increased administrative funding or increasing staff provides a return on that investment (increasing tax collection and reducing the tax gap). Second, this study will examine several institutional variables (social, legislative, administrative) to present alternative, less explored methods to decrease the tax gap.

This research is important because if a constant rate can be associated with an increase in staff or funding, then that method can be applied across many, if not all governments reducing the tax gap. If institutional variables reveal alternative methods of decreasing the tax gap, this may result in additional revenue for local and federal government. The United States and international governments could benefit from reducing the tax gap because it may decrease government deficits and allow for increased spending for the public good. The analysis could reveal that, at some point, any method employed will not result in positive returns. Identifying this will allow governments to prevent resources from being wasted.

9:20 – 9:40 a.m.

### Do Students Really Learn While Studying Abroad: An Analytical Approach Using Data Collected from Guatemala Study Abroad

**Sinath Keo** | Senior; Accounting with a minor in Business Administration; Phnom Penh, Cambodia

**Adam Hickerson** | Junior; Business Administration with a concentration in Professional Golf Management; Greenville, OH

Advisors: Dr. Mary Kirchner & Dr. Spencer Davis

Methodist University offers a variety of study abroad programs for its students. These trips range in time abroad from a semester to a week. One trip offered is a week in Panajachel, Guatemala. Methodist University has offered this trip to the student body since 2010. We analyzed data to ascertain if learning occurred during the students' time in Guatemala.

The Guatemala study abroad trip is offered during fall or spring break. Each day of the trip includes a four-hour one-on-one

Spanish lesson as well as half-day excursions. These excursions allow students to apply knowledge gained during their lessons to real life situations, as well as immersing them in the culture of the Mayan people of Panajachel. During their time in Guatemala, students stay with host families.

In order to measure if learning outcomes had been achieved, student travelers were given pre- and post-trip surveys. The data set included 28 students from three separate trips: 2014 spring, 2014 fall, and 2015 spring. All of the students surveyed were undergraduate students who were traveling to Guatemala for the first time. The survey employed a four-level Likert scale, and 15 questions were analyzed. A two-sample t-test assuming unequal variances was performed.

If analysis showed that student learning did not occur in one or more areas, changes could be made to the study abroad trip to address this problem. Limitations of both the data collection and methodology were considered.

9:40 – 10:00 a.m.

### Beyond Borders: Students' Cultural and Business Experience from China

**Laura Allred** | Junior; Exercise and Sport Science; Asheboro, N.C.

**Rachael Carlton** | Junior; Business Administration; Mt. Olive, N.C.

**Jason Pfannschmidt** | Senior; Accounting; Rockville, Md.

**Nicholas Murn** | Senior; Business Administration; Mooresville, N.C.

**Christopher Naiberk** | Senior; Sport Management; Hatboro, Pa.

**James Ammons** | Senior; Entrepreneurship; Fayetteville, N.C.

**Breanna Frazier** | Junior; Health Care Administration; Sierra Vista, Ariz.

**Heyi Gong** | Sophomore; Sport Management; Jimo, Shandong, China

Advisors: Dr. Kimberly Scruton & Dr. Pam Strickland

This group will present regarding the knowledge learned, insights gained and other experiences and observations while studying abroad in Beijing and Chengdu, China. These participants spent ten days immersed in Chinese business, culture and customs and had the opportunity to interact with Chinese university students and residents, in addition to visiting famous Chinese landmarks and meeting corporate professionals at business locations in China. Students were required to keep a daily journal that assisted as they prepared for the final paper in the course and this presentation.

**MORNING SESSION | MATH AND CHEMISTRY | HENDRICKS 122**

9:00 – 9:20 a.m.

**The Relationship Between Primes and Consecutive Integers**

**David Shane** | Junior; Mathematics; Syracuse, N.Y.  
**Safar Adam Kurbansho** | Junior; Mathematics and Financial Economics; Dushanbe, Tajikistan

Advisor: Dr. Shivappa Palled

Although number theorists have established myriad theorems regarding prime numbers, our preliminary study has exposed intriguing properties of primes and their decomposition into consecutive integers. In this paper, we develop a method for analyzing consecutive integers, noting their relationship with prime numbers, and recording the unique properties with the

intent to augment the knowledge of the prime set. Our research demonstrates that there are several interesting connections between prime numbers and their decomposition into consecutive integers, which is promising for future research in this area. Analyzing the properties of consecutive integers through “integer tables” reveals several noticeable patterns, one of which suggests that there are certain cases in which we can expand on the accuracy of Bertrand’s Postulate. We also analyze the case of twin primes and note their unique status of sharing a consecutive integer that has a factor of three. Lastly, we explore the decomposition of primes into consecutive integers through tree diagrams. The relative scope of our methods spans across the fields of elementary number theory, set theory, and algebra.

9:20 – 9:40 a.m.

**Separatory Analysis of Acetic Acid in Sports Drinks and Food Products and its Role in Exercise-Associated Muscle Cramp Relief**

**Katayoon Dowlatshahi** | Senior; Chemistry with a concentration in Biochemistry; Fayetteville, N.C.

Advisor: Dr. Stephanie Hooper Marosek

Acetic acid solutions have recently gained prominence in the athletic industry because of their notable ability to significantly reduce exercise-associated muscle cramps (EAMCs) as well as function in rehydration. Acetic acid is a carboxylic acid that reacts with coenzyme A, resulting in a thioester bond that generates acetyl coenzyme A (acetyl-CoA); the enzyme choline acetyltransferase is then involved in the synthesis of acetylcholine, a neurotransmitter that has a key role in generating muscle movement, from acetyl-CoA and choline. Previous

experimentation has shown the exact electrolyte contributions of various sports drinks and food products, such as Gatorade, Powerade, Propel, apple cider vinegar, dill pickle juice, sweet pickle juice, yellow mustard, Smartwater and E-Lyte Sport, with appropriate electrolyte intake being necessary in preventing EAMCs. It is hypothesized that the increased presence of acetic acid in these analytes will cause for the greater production of acetylcholine, which also has a dominant role in inhibiting the onset of EAMCs. Scientific literature further states that acetic acid will stimulate the production of the inhibitory neurotransmitters serine and glycine, which also lessen EAMCs. In order to test this theory regarding the influence of acetic acid, the analytical techniques of ultraviolet-visible spectroscopy (UV-Vis spectroscopy), titrations, pH measurements, capillary electrophoresis, and gas chromatography will be employed to appropriately discern the most viable analyte that can impede EAMCs. These findings can then be appropriately applied towards the advancement of athletic performance and endurance.

**MORNING SESSION | LITERATURE AND MUSIC | HENDRICKS 222**

9:00 – 9:20 a.m.

**A Gender-Bound Domain in Teotitlán del Valle: The Evolving Roles of Zapotec Women**

**Cheri D. Molter** | Senior; History, English, and Writing with minors in Religion and Women’s Studies; Fayetteville, N.C.

Advisor: Prof. Robin Greene

Only fifteen miles east of Oaxaca City, Mexico, Teotitlán del Valle is a small village that is home to a community of Zapotec weavers whose ancestors lived in the region for more than three thousand years. In her book “Oaxaca Celebration,” Mary Jane Gagnier de Mendoza writes, “With a population of more than eight thousand and practically every person over age fifteen participating in the weaving process, Teotitlán may very well be the

largest hand-weaving community in the world.” Although many steps toward gender equality have been taken within the past thirty years, women have been oppressed in this Zapotec community by the normalization of institutionalized patriarchal ideology, which permeates the local government, the religious doctrine, and the culturally prescribed gender roles. Zapotec women live within an “enclosed garden” in which their labor is socially valued, but their voices, or any other expression of self-autonomy, are not. Despite the slow social acceptance of educating girls and other egalitarian changes that have occurred in recent years—like women getting their driver’s licenses—many Zapotec women endure, still living within culturally ascribed boundaries that prevent them from experiencing self-autonomy and independence.

**MORNING SESSION | LITERATURE AND MUSIC | HENDRICKS 222 (CONTINUED)**

9:20 – 9:40 a.m.

**The Archpriest of Hita: Sinner or Human?**

**Lindsey Pritchard** | Sophomore; Environmental and Occupational Management with a concentration in Regulatory Compliance and Natural Resources and minors in Spanish and Military Science; Strongsville, Ohio

Advisor: Dr. Cristina Francescon

If a priest writes a book about various sexual adventures and fantasies, is he a sinner? Or is it justified because it is human nature to have these thoughts? The purpose of this essay is to analyze various theories as to why Juan Ruiz, a priest from the Middle Ages, wrote the “Libro de Buen Amor” (Book of Good Love). In addition, this essay will also demonstrate the views of critics who agree and disagree with the publication of this book and their reasons for their thinking.

9:40 – 10:00 a.m.

**Bagpipes: The Social Journey of a Unifying Instrument and its Effect on Catholic Church Music**

**Hannah Boyles** | Junior; Music Education; Vale, N.C.

Advisor: Dr. Scott Marosek

Throughout the Medieval Period, the Catholic Church maintained authoritarian control over its subjects. Beneath the

peasant revolts and civil unrest, musicians and traveling minstrels began spreading the use of bagpipes. Bagpipes became a symbol of social unity and connected the Catholic Church to its people through many aspects of medieval society and music within the Catholic Church. By the end of the Medieval Period and into the beginning of the Renaissance, bagpipes were able to influence compositional techniques of sacred musicians and act as a connection between the Catholic Church and the peasant class.

**MORNING SESSION | LEADERSHIP PANEL | NURSING 103**

9:00 – 10:00 a.m.

**Panel: Issues in Generational Leadership**

- ◆ **The Psychology of Choosing a Leader (Erin Arauz)**
- ◆ **Leadership Passed Down Through the Generations (Kylie Arauz)**
- ◆ **The Shift of Leadership Skills from Generation to Generation (John Estle)**

**Erin Arauz** | Senior; Entrepreneurship with a minor in Leadership; Fayetteville, N.C.

**Kylie Arauz** | Senior; Computer Information Technology with a minor in Leadership; Fayetteville, N.C.

**John R. Estle** | Junior; Exploratory; Fayetteville, N.C.

**Cani Fajak** | Sophomore; Applied Communication with a concentration in Organizational Communication and Leadership; Fayetteville, N.C.

Advisor: Dr. Bill Watt

No matter what view of politics a person has, it is important to consider the psychology of how a person selects a leader. This panel will attempt to pin point reasons that people choose certain

candidates or lean towards different sides of the floor. These reasons are explored by examining the President of the United States to support the psychology of the points of this approach to understanding leader selection. In addition, the panel will address how leadership passes from generation to generation. While this is a broad topic, the panel focuses on how leaders learn their skills through older leaders and the wisdom more experienced leaders bring to the table when teaching and mentoring the up and coming leaders of the next generation. Also, the panel will address skills used by 21st century leaders that may or may not be different than those used by 20th century leaders. The panel focuses on the shift of leadership skills from generation to generation from the 1950s to the present, including the impact of modern technology. Finally, the panel asks if 21st century leaders will need to balance personal, group, community, national, and international interests so that all are better off. The question is asked if such leaders must possess self-awareness, have an internalized moral perspective, and demonstrate balanced processing skills along with relational transparency.



**CHAPEL | 11:00 A.M. | HENSDALE CHAPEL**

**The United Methodist Church and Human Sexuality: Moving Forward in Unity**

**Chantal M. Abbuhl** | Senior; Religion; Lillington, N.C. followed by Holy Conversation: a roundtable discussion on a way forward  
Co-leaders: Dr. George E. Hendricks and Rev. Kelli W. Taylor

**AFTERNOON SESSION | PSYCHOLOGY | ALUMNI DINING ROOM**

2:00 – 2:20 p.m.

**The Impact of Sleep and Emotional Content on Learning Efficiency**

**Alexis Patterson** | Senior; Psychology with a concentration in Clinical Counseling; Clayton, N.C.  
**Taylor Hales** | Senior; Psychology; Salisbury, Md.  
**Shamar Johnson** | Senior; Psychology with a concentration in Clinical Counseling and a minor in Military Science; Wilmington, N.C.

Advisor: Dr. Katharine Snyder

Using word pairs, the experiment will focus on how sleep affects learning. Prior research has shown that there is a correlation

between sleep adequacy and the type of verbal learning expected in most college classrooms. In addition, the present study included positive emotional words and negative emotional words to assess the impact of emotional content. Research has shown learning is more efficient (enhanced primacy effects) for negative emotional material than positively emotional material. It is predicted that there will be greater recall for the negative word pairs compared to the positive word pairs. Recall is also predicted to be best for those subjects reporting high quality sleep when learning the negative word pairs. This experiment is important not only to Methodist University, but the psychology field as well because it can answer important questions dealing with emotional processing, how individuals learn, and exposure to emotional advertising.

2:20 – 2:40 p.m.

**The Impact of the Defendant’s Physical Attractiveness on Mock Juror Estimates of Criminal Culpability**

**Cynthia Newby** | Senior; Psychology with a concentration in Clinical Counseling; Visalia, Calif.  
**Rocio Serna** | Junior; Psychology with a concentration in Clinical Counseling; Chula Vista, Calif.  
**Lydia Werhmann** | Senior; Psychology with a concentration in Clinical Counseling; Port-Au-Prince, Haiti

Advisor: Dr. Katharine Snyder

The present study is an experiment on Mock Juror Bias. One hundred undergraduate students from Methodist University read a court room trial case scenario and completed the Keirsey Temperament Sorter followed by a juror bias survey. For the

courtroom trial portion, students read a transcript that included a photograph of the defendant. The picture was either an attractive person (positive image, male or female) or a non-attractive person (negative image, male or female). Participants then assessed the defendant’s criminal responsibility. It was hypothesized that the physical attractiveness of the defendants will impact judgments of criminal culpability, especially for participants who are high in openness to experience on the Keirsey.

*\*Note: “Openness” is defined as: an overarching concept or philosophy that is characterized by an emphasis on transparency and free, unrestricted access to knowledge and information, as well as collaborative or cooperative management and decision-making rather than a central authority. Openness can be said to be the opposite of secrecy.*

2:40 – 3:00 p.m.

**The Physiology of True, False, and Internalized False Confessions**

**Taylor Porter** | Senior; Psychology with a concentration in Clinical Counseling and minors in Criminal Justice and Applied Forensic Science; Roseboro, N.C.  
**David McNeil** | Senior; Psychology with a concentration in Clinical Counseling and a minor in Biology; Fayetteville, N.C.  
**Kristina Turner** | Senior; Psychology with a concentration in Clinical Counseling and a minor in Forensic Science; Ocoee, Fla.  
**Ashley Dittmar** | Senior; Psychology; Fayetteville, N.C.

Advisor: Dr. Katharine Snyder

Research on neural activity may indicate how someone could internalize or come to believe a false confession. By understanding how false confessions occur, we can attempt to prevent them

and reduce of impact of a profound phenomenon known as confirmatory bias. The experiment is run in several phases. During Part 1, participants are instructed to lie (red light on) or tell the truth (green light on) to a series of neutral questions. During Part 2, participants review a list of words and cross out items that are present in another stimulus list. During Part 3, subjects are instructed to recall whether or not they had crossed out the words in the presence of the red or green light. In line with prior research, it is hypothesized that more false confessions (asserting that a word is crossed out when it is not) will occur in the presence of the red light. Given prior research on cognitive load, it is anticipated that greater cortical activation, especially in the frontal cortex, will occur for untruthful responses in Part 1 and the false confessions in Part 3. Applications of the present research to judicial proceedings and police interrogation will be discussed.

**AFTERNOON SESSION | PSYCHOLOGY | ALUMNI DINING ROOM (CONTINUED)**

3:00 – 3:20 p.m.

**Effect of Body Posture and Situational Interest on Working Memory**

**David Doss** | Senior; Psychology; Fayetteville, N.C.  
**Pauling Bynum** | Senior; Psychology; Raleigh, N.C.  
**Amanda Pulliam** | Senior; Psychology with a concentration in Clinical Counseling; Fayetteville, N.C.

Advisor: Dr. Katharine Snyder

Prior research has shown that body postures have an effect on working memory. This hypothesis has been supported by physiological research that has utilized EEG, MRI and other imaging methods. However, situational interest may also be important in determining the effect that one's body posture has on working memory. Another variable we considered is mood. The aim of this experiment is to identify the postural positions, situational interest levels, and mood states that are the most conducive to our working memory. There will be a minimum

of 24 subjects who will be randomly assigned to 1 of 3 posture levels (Good, Neutral, Bad) and 1 of 3 situational interest levels (High, Medium, Low). The postures will be maintained through the combined effort of the participant and the experimenter. The situational interest levels will be in the form of images that have been pre-rated for valence, arousal, and avoidance/approach. Subjects will simultaneously experience both independent variables and during this time complete an N-Back working memory task. Also during this time, participants will be connected to EEG equipment. The mood variable will be measured using the Multidimensional Mood Questionnaire (MDMQ). We expect to see an improvement in working memory scores as the posture levels move from bad to good and as situational interest levels move from low to high. Both of these variables will likely be affected by mood. Through the maintenance of good posture and the experience of situationally interesting environments we can improve our working memory and enhance our learning.

**AFTERNOON SESSION | COMPUTER SCIENCE | HENDRICKS 122**

2:00 – 2:20 p.m.

**vbsDB: The Use of Databases to Organize Students**

**Alexander Hamilton** | Junior; Computer Science with a minor in Digital Forensics and Cybersecurity; Spring Lake Heights, N.J.

Advisor: Dr. Tat Chan

This research project is a desktop application, named vbsDB, that will be written to solve the problem of disorganization that many churches face when it comes to Vacation Bible School (VBS), a yearly event to help teach kids about Christianity in a fun a way.

This disorganization can cause students not to get the most out of their experience during VBS. The research will find the most optimal way of organizing data to be accessed by leaders of VBS in order to ensure the safety of the children, the happiness of everyone, and a reduction of stress for those in charge. During the course of this research, VBS directors from all across the country will be contacted in order to find what they need out of an application in order to keep their VBS running smoothly. The presentation will focus on the structure of vbsDB, how it works, and how the core concepts can be migrated into much larger pieces of software.

2:20 – 2:40 p.m.

**Symba: Know Your Campus**

**Chittachone Elvin Bounphengsy** | Senior; Computer Science; Mount Gilead, N.C.  
**Vincent Awong-Cole** | Senior; Computer Information Technology with a concentration in Business Information Systems; Troy, N.C.

Advisor: Dr. Bing Qi

Even though Methodist University is quite small in size, it is still faced with a problem larger universities often encounter: the problem of not knowing. For new students, the problem is not

knowing the location of their classes. For returning students, the problem is not knowing what classes are available to schedule. And for the bored, it's not knowing what events are happening around campus.

For these very reasons, Symba was created. Symba is an Android mobile application that would be able to tell you the location of your class and, if needed, guide you to them. It would also be able to display all classes available for the student to register as well as campus news, upcoming events, and contact information if the user needs additional help.

**AFTERNOON SESSION | COMPUTER SCIENCE | HENDRICKS 122 (CONTINUED)**

2:40 – 3:00 p.m.

**DevTracker: Software That Improves Overall Developer’s Productivity**

**Davor Pranjić** | Sophomore; Computer Science with a minor in Digital Forensics and Cybersecurity; Mostar, Bosnia and Herzegovina

Advisor: Dr. Terry House

Procrastination and focusing on non-productive activities is one of main problems for software developers. To improve overall productivity it is required to organize and use time more effectively.

As an example, at the end of the day, a freelance developers would like to know how much of their time they spent programming and how much of their attention went to social media.

A solution for this is a background running, low-memory consuming software that would keep track of how much each of the processes has used, and how much programming time a specific programmer has used in a day. Besides detailed analysis, software would synchronize the programmer’s comments from source code such as “TODO,” “BUG,” and “PATCH” and categorize them on a task list providing better organization and a better look into overall software development.

**AFTERNOON SESSION | HONORS PROGRAM PANEL | HENDRICKS 222**

2:00 – 3:30 p.m.

**Panel: Honors Program**

(Student presentation order may change)

**Vaccines and Herd Immunity: The Clash of Individual Freedom and the Social Good**

**Tatum Kram** | Senior; Biology with a minor in Chemistry; Littlestown, Pa.

Advisors: Dr. Jennifer Rohrer-Walsh and Dr. Richard Walsh

As Mill knew long ago (and Greek philosophers to some extent before him), a good — and healthy — society not only respects but also depends upon individual freedom. Democratic societies, in particular, wish to protect individual freedoms. But jurists, politicians, and philosophers have also claimed that individual freedom cannot include actions detrimental to other individuals or to society as a whole. Does this caveat apply to those individuals who wish to refuse vaccinations? If science shows that individual

rejections of vaccines will likely put “herd” immunity at risk, do the good/rights/health of the many/society not trump the rights of the individual? As a future health care provider, I want to be clear about and respectful of both the individual’s freedom (the patient) and the good of the community. The individual is not an object to be fixed like a machine through care they do not desire; however, to be part of a community, the individual must relinquish certain individual freedoms to remain in a healthy community. As a prospective graduate of a liberal arts education, I, not surprisingly, argue that the first step in resolving potential clashes between individual freedoms and the social good is the education of the individual — in both science and ethic. My research and presentation on this topic reflects my liberal arts core, my Biology major, and my Honors Program reading (e.g., Aristotle, Kant, Mill, Freud, Foucault, Buber, R. Bellah).



**Compassion**

**Sheryl Brock** | Junior; Environmental and Occupational Management and Biology with a concentration in Regulatory Compliance and Natural Resources; Fayetteville, N.C.

Advisor: Dr. Jennifer Rohrer-Walsh

“Compassion” entails similar stories that reflect the idea of compassion and the effects it has on individuals in various situations. Compassion is more than giving or receiving gestures of support; rather it is truly feeling happy with oneself and letting those emotions branch out to other individuals. An individual cannot practice compassion unless he or she is happy themselves –

as I have heard before, your glass must be full before you can pour yourself into someone else. Throughout the paper, the comparison of three Great Books is used to demonstrate the recurring idea that compassion has remained the same idea throughout time. The importance of studying compassion is shown through the use of examples and presentations of movies, books and plays that were presented at Methodist University. Compassion is embedded into everyone at a young age, but at some point, there comes a time when the journey through compassion requires more action than what is given. Learning about compassion does more for an individual than what words can explain, so rather than relying on sympathy or empathy – learn about compassion.

## AFTERNOON SESSION | HONORS PROGRAM PANEL | HENDRICKS 222 (CONTINUED)

### Empathic Management

**Danielle Burns** | Senior; Business Administration with a concentration in Professional Golf Management and a minor in Accounting; Snoqualmie, Wash.

Advisors: Dr. Jennifer Rohrer-Walsh and Dr. Richard Walsh

My Honors 4010 Senior Project connects my management and leadership studies with the Honors Program reading. In a conversation about the broad similarities between themes in those areas, one of my business professors suggested that I might read Robert A. Brawer's book, "Fictions of Business: Insight on Management from Great Literature." Brawer believes reading literature is important because "the most complex and persistent problems facing us as managers and executives in corporate life are often distinctively human problems." Literature may

not instruct us in business techniques and details, but it does help us think critically and understand what it is that makes us human. The similarity to the goals of a liberal arts education is obvious. Building on Brawer and my Honors Program reading, I developed a reading list for Honors 4010 so that I could compare the study/theory/lessons of modern day leadership studies and business management with the presentation of leaders/heroes in (some of) philosophy and literature. In my presentation, I will describe some of the results of this study. Succinctly, leaders, heroes, and managers are creations of particular cultures, but despite this diversity, there are common elements or themes in the construction of a hero in terms of literary patterns and rhetoric in philosophy, literature, management, and leadership studies. In addition, I also noticed great leaders care for their followers as people not just a means to an end, so I am beginning to cultivate empathy in my management style.



### War for the Roses

**Christopher Miller** | Junior; Biology; Four Oaks, N.C.

Advisor: Dr. Jennifer Rohrer-Walsh

An exploration of the Great Books reveals the characteristics, codes, and cycles of a given culture. While some of these characteristics can be attributed to particular philosophies, a few traits seem to be more universal. To address the question regarding

one of these ubiquitous traits, i.e. depictions of love, a comparison is made among events in three ancient texts: The Ramayana, The Odyssey, and The Epic of Gilgamesh. The comparison highlights ancient, as well as modern, humanity's inclination to grasp the object of one's affection a bit too firmly and the strife that can be caused through such overexertion. The experiences detailed in the comparison are a reminder that, since all actions come tethered with consequences, careful consideration of one's choices can be beneficial.



### *The Analects and Economics*

**Nomcebo Vilane** | Senior; Financial Economics; Mbabane, Swaziland

Advisors: Dr. Jennifer Rohrer-Walsh, Dr. Richard Walsh and Dr. Matt Dobra

This research involves a discussion centered around various elements of The Analects of Confucius and how they both subvert and endorse various ideas or schools of thought in economics

and, consequently, politics. The prime link between economic schools of thought and The Analects is the fact that in 130 BCE, Confucian texts became the basic training for government officials. The goal of this research is to show both the dissonance and harmony of counterintuitive ideas from both these disciplines merging together and to make sense of some of the decisions made by both governments and private citizens. This has been done by examining elements such as the Confucian ethic, the Confucian great-relationships, systems of governance, morality and justice, and the idea of personal gains and self-cultivation.

**AFTERNOON SESSION | SOCIAL WORK, SOCIOLOGY, AND HEALTH CARE  
ADMINISTRATION | NURSING 103**

2:00 – 2:20 p.m.

**Uplifting Ethiopian Farmers from Poverty**

**Marta Tizazu Getahun** | Junior; Social Work and Legal Studies;  
Gonder, Ethiopia

Advisor: Dr. Carla Fagan

The primary purpose of this project is to develop a model that can contribute to the reduction of the risk of starvation in drought-prone regions of Ethiopia. This project will focus on the Gojjam region in northwest Ethiopia. Regions like Gojjam experience repeated crop failure and food insecurity resulting from drought.

in frequency with climate change.

This proposed project will address this problem through a collaborative process with farmers, Debre-Markos University, and the writer. This collaboration will result in the selected farmers being able to create small, sustainable water reservoirs and irrigation systems as well as drought-resistant cultivation methods. It will also serve as a model for other regions in Ethiopia. This will be accomplished by developing a training and mentoring process in which the farmers who pilot the project will teach and support two other farmers the following year.

2:20 – 2:40 p.m.

**Will Ethiopia Overcome Malnutrition?**

**Marta Tizazu Getahun** | Junior; Social Work and Legal Studies;  
Gonder, Ethiopia

Advisor: Dr. Carla Fagan

The primary aim of this research paper is to examine the negative consequences of malnutrition on children ages one to 10 and women ages from 25 to 52. This research will focus on the Ethiopian community. Malnutrition is related to poor health,

inadequate sanitation and poor diet. This research will examine the main factors of malnutrition in developing countries, mainly in Ethiopia. Furthermore, this research will describe the role of both domestic and international non-governmental organizations (NGO) in tackling the problem. The author recommends further research be done to identify effective programs that eradicate malnutrition and replicate them throughout the country. In this research, the author attempted to address the short- and long-term impacts of malnutrition in Ethiopia and East Africa.

2:40 – 3:00 p.m.

**Generation Z Attitudes About the Cost of Higher Education**

**Cheryl Harris** | Senior; Sociology; Ahsoskie, N.C.

Advisor: Dr. Regina Smardon

This study analyzes an original sample of survey results from March 2017 among Methodist University undergraduate students. The goal of the study is to find out how Generation Z (b. 1998-current) students may differ in their views regarding the cost of a college education when compared with Millennial (b. 1981-1997) students. Specifically, this research tests the hypothesis that Generation Z has a higher level of concern about the cost of higher

education. Previous research (Hawkins 2015) demonstrates that the Millennial Generation has a higher level of concern about the cost of education than Generation X (b. 1965-1980). I am using age ranges from a recent Pew Foundation report to define generational cutoffs (Livingston 2017). Sociologists of consumer culture have suggested that Millennial college students have grown up with easy access to credit, and this has created a generation of compulsive spenders (Roberts & Jones 2001). This theory does not explain the shift that appears to be happening with the spending attitudes of Generation Z, especially their attitudes about the cost of higher education (Seemiller & Grace 2016). This research will help explain the shift in attitudes about the cost of college between Millennials and Generation Z.

3:00 – 3:20 p.m.

**Healthcare Systems Response and Actions Before Epidemiological Emergencies**

**Elvin Espinoza** | Freshman; Health Care Administration; Panama City, Panama

Advisor: Dr. Donald Brady

This research paper will cover the extent to which current healthcare institutions prepare for managing and controlling the scale to which viruses and other highly contagious diseases spread

across populations, as well as the methods and procedures that have been developed over the past decades to combat and prevent future cases of health-related emergencies. An integral component of this research will be the analysis and comparison between local and global scale diseases. Additionally, the coordinated response and measures that healthcare organizations carry out to limit the mortality and scope of current diseases. Finally, this investigation will summarize the points of view of different experts in the subject in order to reach a broad discussion on how the practices and processes implemented during previous epidemiological cases were successful or not and the lessons learned from them.

**POSTER SESSION | 2:30-3:30 P.M. | BERNS STUDENT CENTER**

Posters will be on display beginning at 9:30 a.m. in the Berns Student Center. Students will stand by their poster between 2:30 - 3:30 p.m.

**Sympathetic Denervation Significantly Modifies the Skeletal Muscle Transcriptome**

**Meaghan O'Meara** | Junior; Kinesiology; Falls Church, Va.

Advisor: Dr. Trey Hoyt

The sympathetic nervous system (SNS) innervates many organs, but the innervation of skeletal muscles is not well studied. This hampers our ability to understand and treat impaired muscle innervation that occurs with aging and neurodegenerative diseases. It was hypothesized that the SNS regulates gene networks essential for muscle structure and function in adult mice by regulating gene transcription and effectively modifying myofiber transcription. To examine the effect of sympathetic denervation on the muscle transcriptome, RNA extraction was performed on sympathectomized and sham mice. Sympathetic

innervation was removed from C57BL/6 two month old mice at the L2-L3 level through a bilateral sympathectomy. Sham mice underwent the sympathectomy, but kept the innervation. Pure RNA was hybridized at the Wake Forest Microarray Core and top differentially expressed RNAs were analyzed with qRT-PCR. Through the analysis gene fold change was seen for 45,142 analyzed genes. A heatmap showed the top 29 differentially expressed genes. The highly up and down regulated genes were analyzed by Ingenuity Pathway Analysis and were identified as members of five main gene networks, each depending on a specific regulator (huntingtin, protein kinase AMP-activated noncatalytic subunit gamma3, amyloid beta precursor protein, IGF1R, and tumor protein 53). It was found that the SNS regulates skeletal muscle gene networks essential for gene transcription regulation, circadian rhythm, synaptic structure, vesicle integrity, ubiquitin proteasome system, myogenic differentiation, and myofiber mass.

**Green and Gold Dining Room Evaluation**

**Mohammed Mahdi** | Freshman; Engineering; Baghdad, Iraq

**Samson Demeke Gizaw** | Sophomore; Computer Science; Areka, Ethiopia

**Brandon Hunt** | Freshman; Engineering; Snow Hill, N.C.

Advisor: Dr. Denise Bauer

Have you ever waited in line or had trouble maneuvering around in the Green and Gold dining room? Is there a better way to organize the food areas? Our team took on the challenge of defining the exact problems of the Green and Gold dining room and developed our own designs that hope to help solve and improve the current design. To accomplish this, the team first interviewed several students asking them what they thought

about the dining room service and what they thought should be improved. From those interviews, it was found that a majority of students identified common issues in the dining room, such as food options and variety, location of certain food stations, and announcements about events and holidays. Our team then came up with different designs and started evaluating the designs based on different criteria, such as cost and time consumption. The team has not decided on the final design yet, but the most suitable idea is making a Facebook page where the Cafeteria can post their schedule of working hours, announce special events, post more information about the meal plan, food options, and allow students to reach out and ask questions as well as suggesting more ideas on the service. The team may choose more than one final option depending on the results of the final evaluation.

**Traffic Flow in the Berns Area**

**Natasha Ng'ambi** | Freshman; Engineering; Lusaka, Zambia

**Alexander Kachler** | Sophomore; Engineering; Lithia, Fla.

**Alfredo Midence Ordoñez** | Freshman; Engineering; Tegucigalpa, Honduras

**Raysean Myers** | Freshman; Engineering; Fayetteville, N.C.

Advisor: Dr. Denise Bauer

Have you ever waited in line or had trouble maneuvering around the Lion's Den? Could there be a better way to organize the areas? What do other students think? What about the workers? We sought answers to these questions to determine if we should focus on the entire Lion's Den area or only a certain portion. Our decision was to look at the overall flow of traffic in the area. We

gathered information from students with a survey that included questions related to often they visit the Lion's Den, what time they visit, their thoughts on overcrowded areas, and if it is difficult to move around. A similar survey was given to employees that asked them about their opinions on times the area is most crowded, their recommendations on reducing/changing traffic flow, and if they would like to see changes to the layout. After observations and collecting the surveys with staff members and students, we developed a few ideas to solve the problem: (1) Create stations at Starbucks to help organize the lines and limit overflow into the hallway. (2) Rearrange the table placements in both seating areas to allow better flow to the Post Office as well as more comfortable seating in the booth area. (3) Arrange planned recycling bins in convenient locations so that they will be used but not in the way of the traffic flow.

**POSTER SESSION | 2:30-3:30 P.M. | BERN'S STUDENT CENTER (CONTINUED)**

**Parking on Methodist University Campus**

**Keith Hardie** | Junior; Engineering; Oxford, N.C.  
**Malik Jenkins** | Freshman; Engineering; New Bern, N.C.  
**Obaida Zeino** | Freshman; Engineering; Aleppo, Syria  
**Tyler Beyel** | Freshman; Engineering; Camden, N.C.

Advisor: Dr. Denise Bauer

A major issue on the Methodist University campus that has been complained about by residential students, commuters, and even faculty is parking. Our team of prospective engineers decided on four locations that appear to have the most severe parking concerns: Bern's Student Center, around North Hall/Village houses, the Freshman dorms, and by the golf course/tennis courts/practice field/softball field. We decided on these locations by surveying members of the community, using ratios of people in an area to

parking spaces, and recalling our own personal experiences. We surveyed a sample of residential students, commuter students, and faculty to gather public opinion. In the Village area, we calculated that the number of people living in the five houses plus those living in North Hall wildly surpasses the number of actual parking spots for the location. Most of us are also athletes and experience the daily parking struggle down by the tennis courts and practice fields. Our preliminary ideas include constructing a parking deck, building a new parking lot behind the soccer field and adjacent to the public safety building, extending the parking lots next to both North Hall and the tennis courts, as well as creating biking paths to each building and adding bicycle parking. We will be selecting our final ideas based on the following criteria: how the 10 Year Plan will shape the campus, how much each idea would cost, the level of inconvenience for the students, and how long it would take to implement each idea.



**A Parking Resolution for Methodist University**

**Tanner Blevins** | Freshman; Engineering; Mount Airy, N.C.  
**Themba Shabangu** | Freshman; Engineering; Swaziland  
**Elizabeth Belvin** | Freshman; Engineering; Saxapahaw, N.C.  
**Bryce Kephart** | Freshman; Engineering; Vandalia, Ill.

Advisor: Dr. Denise Bauer

We chose to attack the issue of a very limited amount of parking on campus. When there are not enough spaces for all of the students and teachers to park, getting to class and any other daily function is hectic. To solve this problem, we have devised a plan that will add more parking spaces to campus without suffering the loss of anything important. Our group came up with our ideas by

walking around the campus and checking to see what areas we thought would be the best to use for new parking spaces. We also measured some spaces to see how much of an area it would take to add a sufficient number of new parking spaces. One idea for new parking spaces is to clear the wooded area beside Weaver Hall and pave as much open space as possible. By choosing this option, no buildings or campus structures would have to be eliminated. Another option would be to pave behind the Riddle Center so that people would be more apt to park there. If there was a paved surface in this area instead of gravel, people would be more likely to park there. We came up with these ideas by determining what would save the most space and by what would be the most cost efficient. Both of these factors are extremely important to a school that is on a budget.



**Congestion in the Lion's Den**

**Busani Mhlanga** | Freshman; Engineering; Mbabane, Swaziland  
**Endashaw Tonja** | Freshman; Engineering; Addis Ababa, Ethiopia  
**Jeff Williams** | Sophomore; Engineering; Spring Lake, N.C.

Advisor: Dr. Denise Bauer

We examined the Bern's Center Lion's Den to identify concerns and engineer ways to make them better. We decided to address the congestion created during peak hours based on staff member and student feedback as well as our own observations. While the feedback did not directly state congestion as their concern, we noticed that most of their issues (e.g., not enough staff members for efficient service, an order taking too long) lead to congestion. In addition to the food areas, the Lion's Den also contains the

bookstore and post office, meaning that people need to walk through the congestion to get to these services, leading to more congestion. We also observed that the space containing P.O.D, Starbucks, and Chick fil-A is not easy to move about. It could be more comfortable to move in and out if we change their locations. Our first idea was to take away one of the food court areas since it appeared many people only hung out there and were not eating. We would then extend the Chick-fil-A service space, creating more space for the lines. Another of our early ideas is to create an app for students to order from and quickly pick up their food after receiving a notification. We have chosen the food order app as our first plan and then expanding the service area as our second idea. The app was selected because we are a software generation and it would be a much cheaper option than building infrastructure.

**POSTER SESSION | 2:30-3:30 P.M. | BERNs STUDENT CENTER (CONTINUED)****The Intersection of Race and Justice**

**Rebecca Elliott** | Senior; Social Work; Lake Norden, S.D.  
**Javen Henry** | Senior; Social Work; Greensboro, N.C.  
**Michael Johnson** | Senior; Social Work; Roxboro, N.C.  
**Aaron Borden** | Senior; Justice Studies; Columbia, S.C.  
**Travon Scott** | Senior; Social Work; Henderson, N.C.

Advisor: Prof. Nichole Johnson

According to “The Sentencing Project” (2013; Rosich, 2007), 1 in 3 Black males compared to 1 in 106 Caucasian males will

be incarcerated during their lifetime. The importance of being informed on this issue is at an all-time high. With the rise of police brutality and movement groups such as Black Lives Matter saturating our media outlets, it is hard to ignore the current state of race relations in the United States of America. Critical race theory indicates that race is so deeply woven into the fabric of America that it cannot be ignored (Darder, 2011). This study will explore the intersection of race and imprisonment, with a specific focus on Black males, a population incarcerated more than any other race within the United States.

**The Influence of Movement History on Mass-Spring Like Behavior**

**Emir Nazdrjic** | Senior; Chemistry and Mathematics; Potoci, Bosnia and Herzegovina  
**Troy Piorkowski** | Senior; Chemistry with a minor in Biology; Mooretownship, Pa.

Advisors: Dr. John W. Fox<sup>1</sup> and Dr. Wendi H. Weimar<sup>2</sup>

A spring-mass model can be used to characterize common movements like running and hopping. During a stride or a hop, the musculoskeletal action is extremely spring-like in that muscles, tendons, and ligaments store and release elastic energy. Given the sinusoidal nature of the countermovement jump, the spring-mass model has also been used to explain performance in vertical jumping. If a simple linear spring is a valuable model for stretch-shorten cycle type movements, the force decline phase of vertical ground reaction force (GRF) should fit a cosine function of the

following form:

$$F = F_{max} \cos \omega t$$

where F is predicted force, F<sub>max</sub> is the maximum force prior to force decline, ω is the circular frequency, and t is the time. The purpose of this study was to evaluate the fit of a cosine function to the force decline phase of a non-countermovement (nCM), countermovement (CM), and drop (D) plyometric pushup. Our model shows that the force decline profile for nCM provides the best fit to the cosine function compared to CM and D. Anderson and Pandy (1993) showed that more stored elastic energy was lost in a countermovement jump compared to a non-countermovement jump. The findings, of Anderson and Pandy (1993), in conjunction with our findings suggest that the spring-mass model is a better description of the force decline phase of nCM compared to stretch-shorten cycle movements.

<sup>1</sup>Methodist University and <sup>2</sup>Auburn University

**INTERNSHIP POSTER SESSION | 2:30 - 3:30 P.M. | BERNs STUDENT CENTER**

The Methodist University Office of Career Services is committed to assisting students prepare for and secure quality internships and relevant work experiences that will enable them to explore career paths and develop the skills necessary to obtain employment and work satisfaction, to succeed in a global and rapidly changing workforce, and to manage their life-long career strategies. Students are encouraged to begin applying for internships in the fall semester of their sophomore year.

**Pandora Jewelry Americas Headquarters, Baltimore, Md.**

**Alyssa Like** | Senior; Management with a concentration in Business Resort & Club Management; Hope Mills, N.C.  
*Merchandise Planning Intern*

**Richmond Flying Squirrels, Richmond, Va.**

**Amber Bayton** | Senior; Sport Management; Henrico, Va.  
*Funn Bunch Promotions Game Day Intern*

**N.C. Museum of Natural Sciences, Raleigh, N.C.**

**Faith Bowen** | Junior; Biology; Goldsboro, N.C.  
*Summer Camp Intern*

**Duke Talent Identification Program (TIP) Summer Experience, Appalachian State University, Boone, N.C. & Duke University, Durham, N.C.**

**Daniel Sasfy** | Senior; Financial Economics; Hungary  
*Teaching Assistant, Math & Finance*

## AN UPDATE ON THE CENTER FOR RESEARCH AND CREATIVITY Dr. Clay Britton, *Director*

The 2016-2017 academic year has been an exciting one for the CURC. The students, faculty and staff of the University have embraced the mission of the Center, and have truly taken advantage of all of the opportunities the Center provides. A couple of highlights from this year include:

- ◆ Students have been awarded nearly \$8,000 to assist them in their travel to conferences, or to purchase supplies and equipment for their projects. This is an increase of nearly \$1,000 over last year's awards. Representing an increase in the number of students participating in these experiential learning opportunities.
- ◆ Volume III of the Monarch Review: Methodist University's Journal of Undergraduate Research and Creativity was released. The submission period for Volume IV has just closed, and should be released towards the end of the calendar year.

One of the most exciting things that has happened this year is that the CURC was approved to expand its mission to encompass our graduate students and our faculty. Therefore, we have revised the name of the Center to be Methodist University's Center for Research and Creativity (CRC). Over the summer the restructured Advisory Board will begin planning new opportunities to reflect this expansion.

The development and implementation of all of these projects takes a great deal of hard work. I would like to take the time to thank each of the members of the Advisory Board. They are:

- ◆ Prof. Daniel Bennett, School Science and Human Development
- ◆ Dr. Lori Brookman, *ex officio*
- ◆ Dr. Del Crisp, *ex officio*
- ◆ Dr. Cameron Dodworth, School of Arts and Humanities
- ◆ Dr. Trey Hoyt, School of Health Science
- ◆ Dr. JD Knode, Reeves School of Business
- ◆ Dr. Jamie Robbins, School of Science and Human Development
- ◆ Dr. Eric See, School of Public Affairs
- ◆ Dr. Larry Wells, School of Arts and Humanities

New additions to the CRC Board will include:

- ◆ A Graduate Council Representative
- ◆ The Internal Review Board (IRB) Chair
- ◆ Grants and Sponsored Research Officer

I thank all of you, the Methodist University community, for helping make the efforts of the Center for Research and Creativity a success.

# MONARCH REVIEW

METHODIST UNIVERSITY'S JOURNAL OF UNDERGRADUATE RESEARCH AND CREATIVITY

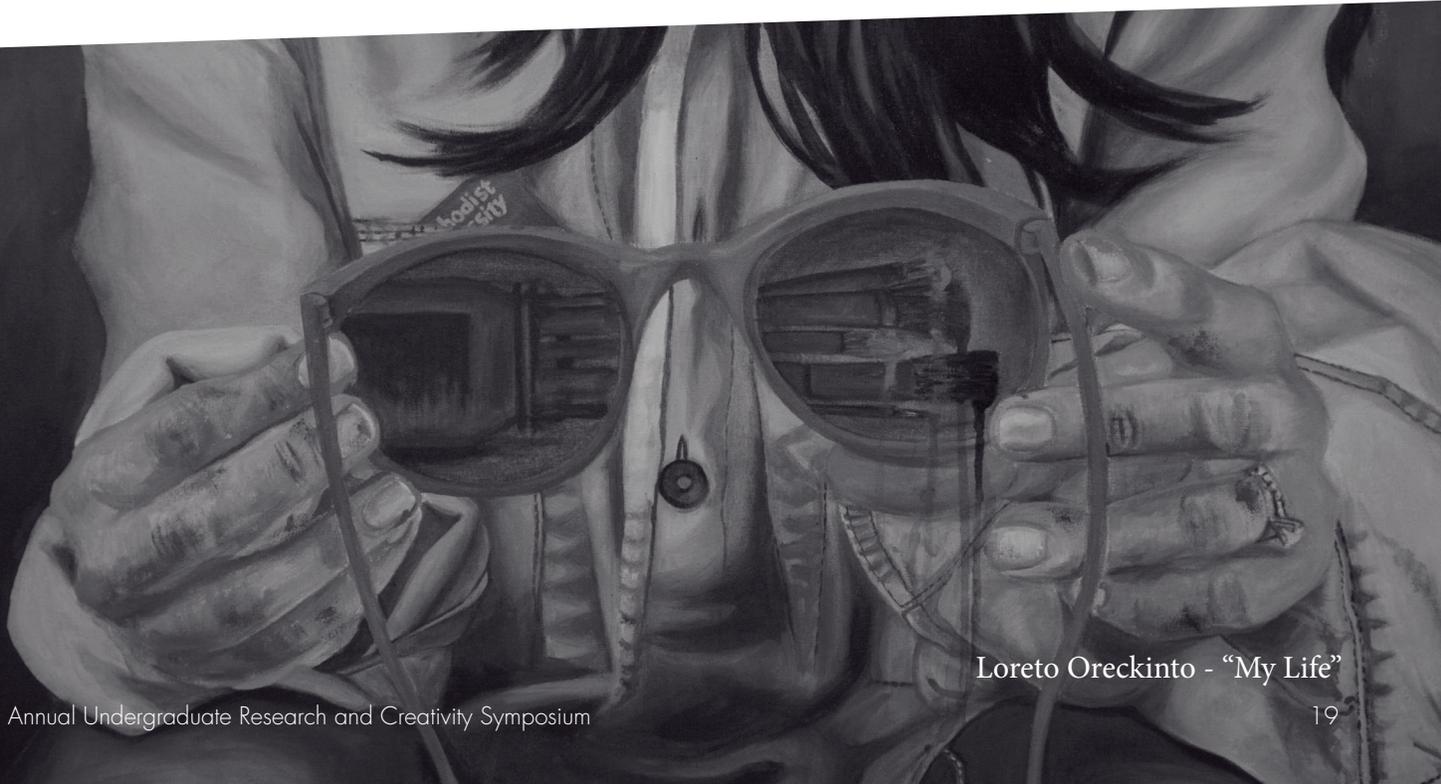
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Loreto Oreckinto - "My Life"



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