RHODES
UNDERGRADUATE

Research AND Creative Activitiy

SYMPOSIUM

MAY 1, 2015

URCAS
Schedule by Division

Poster Presentations
will be in the BCLC from
11:30 AM-1:30 PM & 4:30-6:00 PM

TIME	ROOM	SESSION TITLE	DEPARTMENTS/PROGRAMS
Fine Arts			
1:30-2:00	FJ-B	ACTING & PERFORMANCE	THEATRE
1:30-2:00	MCCOY THEATRE	POINT OF VIEW PRESENTATION/RECEPTION	THEATRE
1:30-2:00	PALMER 208	ACTING & PERFORMANCE	THEATRE
1:30-2:00	CLOUGH-HANSON GALLERY	ARTIST TALKS: SESSION I	ART & ART HISTORY
1:00-3:00	TUTHILL PERFORMANCE HALL	THE CAUTHEN COMPETITION	MUSIC
2:15-3:15	FJ-B	AUDIO-VISUAL	MUSIC, ART, & ART HISTORY
2:45-3:45	CLOUGH-HANSON GALLERY	ARTIST TALKS: SESSION II	ART & ART HISTORY
3:30-5:30	FJ-B	ART 114 FILM SCREENINGS	ART & ART HISTORY
4:00-5:00	MCCOY THEATRE	RHODES/CHS COLLABORATIVE PERFORMANCE	THEATRE
Humanities			
1:30-2:15	PALMER 207	TIME, TEXT, & CULTURE I	ENGLISH
1:30-2:15	PALMER 210	PAST TO PRESENT I	HISTORY
1:30-2:30	LANGUAGE CENTER	SPANISH SENIOR SEMINAR I	MODERN LANGUAGES
2:30-3:15	PALMER 207	TIME, TEXT, & CULTURE II	ENGLISH, GREEK, & ROMAN STUDIES
2:30-3:15	PALMER 210	PAST TO PRESENT II	HISTORY
2:45-3:45	LANGUAGE CENTER	SPANISH SENIOR SEMINAR II	MODERN LANGUAGES
3:30-4:15	PALMER 207	RACE & RACISM	PHILOSOPHY
4:00-5:00	LANGUAGE CENTER	SPANISH SENIOR SEMINAR III	MODERN LANGUAGES
Humanities & Social Sciences			
3:30-4:15	PALMER 210	SOCIAL SYSTEMS & COMMUNITY NARRATIVES	COMMERCE & BUSINESS, PSYCHOLOGY, RELIGIOUS STUDIES
Natural Sciences			
1:30-2:30	FJ-A	QUANTITATIVE & COMPUTATIONAL SCIENCE I	MATHEMATICS & COMPUTER SCIENCE
1:30-2:30	FJ-C	THE NATURAL WORLD FJ-C I	BIOLOGY & CHEMISTRY
2:45-3:30	FJ-A	THE NATURAL WORLD FJ-A I	BIOLOGY
2:45-3:30	FJ-C	THE NATURAL WORLD FJ-C II	CHEMISTRY & PHYSICS
3:45-4:30	FJ-C	QUANTITATIVE & COMPUTATIONAL SCIENCE II	MATHEMATICS & COMPUTER SCIENCE
3:45-4:45	FJ-A	THE NATURAL WORLD FJ-A II	CHEMISTRY
Social Sciences			
1:30-2:30	CLOUGH 204	ETHNOGRAPHY AT HOME I	ANTHROPOLOGY & SOCIOLOGY
1:30-2:30	KENNEDY 208	URBAN STUDIES SENIOR SEMINAR: URBAN & COMMUNITY HEALTH	URBAN STUDIES
1:30-2:45	KENNEDY 205	HOME & ABROAD	INTERNATIONAL STUDIES & POLITICAL SCIENCE
2:45-3:45	CLOUGH 204	ETHNOGRAPHY AT HOME II	ANTHROPOLOGY & SOCIOLOGY
2:45-3:45	KENNEDY 208	URBAN STUDIES SENIOR SEMINAR: COMMUNITY DEVELOPMENT & URBAN NEIGHBORHOODS	URBAN STUDIES
3:00-4:30	KENNEDY 205	OUR WORLD AT WORK	ECONOMICS
4:00-5:00	KENNEDY 208	URBAN STUDIES SENIOR SEMINAR: ACTIVISM, ARTS, & EDUCATION IN THE CITY	URBAN STUDIES

URCAS
Schedule by Room

Poster Presentations
will be in the BCLC from
11:30 AM-1:30 PM & 4:30-6:00 PM

BUILDING	TIME	ROOM	SESSION TITLE
CLOUGH HALL	1:30-2:00	CLOUGH 204	ETHNOGRAPHY AT HOME I
CLOUGH HALL	2:45-3:45	CLOUGH 204	ETHNOGRAPHY AT HOME II
CLOUGH HALL	1:30-2:00	CLOUGH-HANSON GALLERY	ARTIST TALKS: SESSION I
CLOUGH HALL	2:45-3:45	CLOUGH-HANSON GALLERY	ARTIST TALKS: SESSION II
FRAZIER-JELKE SCIENCE CENTER	1:30-2:00	FJ-A	QUANTITATIVE & COMPUTATIONAL SCIENCE I
FRAZIER-JELKE SCIENCE CENTER	2:45-3:30	FJ-A	THE NATURAL WORLD FJ-A I
FRAZIER-JELKE SCIENCE CENTER	3:45-4:45	FJ-A	THE NATURAL WORLD FJ-A II
FRAZIER-JELKE SCIENCE CENTER	1:30-2:00	FJ-B	ACTING & PERFORMANCE
FRAZIER-JELKE SCIENCE CENTER	2:15-3:15	FJ-B	AUDIO-VISUAL
FRAZIER-JELKE SCIENCE CENTER	3:30-5:30	FJ-B	ART 114 FILM SCREENINGS
FRAZIER-JELKE SCIENCE CENTER	1:30-2:30	FJ-C	THE NATURAL WORLD FJ-C I
FRAZIER-JELKE SCIENCE CENTER	2:45-3:30	FJ-C	THE NATURAL WORLD FJ-C II
FRAZIER-JELKE SCIENCE CENTER	3:45-4:30	FJ-C	QUANTITATIVE & COMPUTATIONAL SCIENCE II
HASSELL HALL	1:00-3:00	TUTHILL PERFORMANCE HALL	THE CAUTHEN COMPETITION
KENNEDY HALL	1:30-2:45	KENNEDY 205	HOME & ABROAD
KENNEDY HALL	3:00-4:30	KENNEDY 205	OUR WORLD AT WORK
KENNEDY HALL	1:30-2:30	KENNEDY 208	URBAN STUDIES SENIOR SEMINAR: COMMUNITY DEVELOPMENT & URBAN NEIGHBORHOODS
KENNEDY HALL	4:00-5:00	KENNEDY 208	URBAN STUDIES SENIOR SEMINAR: ACTIVISM, ARTS, & EDUCATION IN THE CITY
MCCOY THEATRE	1:30-2:00	MCCOY THEATRE	POINT OF VIEW PRESENTATION/RECEPTION
MCCOY THEATRE	4:00-5:00	MCCOY THEATRE	RHODES/CHS COLLABORATIVE PERFORMANCE
PALMER HALL	1:30-2:15	PALMER 207	TIME, TEXT, & CULTURE I
PALMER HALL	2:30-3:15	PALMER 207	TIME, TEXT, & CULTURE II
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PALMER HALL	1:30-2:15	PALMER 210	PAST TO PRESENT I
PALMER HALL	2:30-3:15	PALMER 210	PAST TO PRESENT II
PALMER HALL	3:30-4:15	PALMER 210	SOCIAL SYSTEMS & COMMUNITY NARRATIVES
PALMER HALL	1:30-2:30	LANGUAGE CENTER	SPANISH SENIOR SEMINAR I
PALMER HALL	2:45-3:45	LANGUAGE CENTER	SPANISH SENIOR SEMINAR II
PALMER HALL	4:00-5:00	LANGUAGE CENTER	SPANISH SENIOR SEMINAR III

May 1 Events

- Awards Convocation: 9:00AM, Hardie Auditorium
- Poster Session I & Lunch Reception, 11:30-1:30, Multisports forum of the Bryan Campus Life Center
- Oral Presentation Sessions: 1:30-5:30 PM, various locations
- Poster Session II & Closing Reception: 4:30-6:00 PM, Multisports forum of the Bryan Campus Life Center

Acknowledgements and Special Thanks

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URCAS Planning Committee

- Darlene Loprete, Professor of Chemistry. Special Assistant to the Dean, and Director of Undergraduate Research
- Rin Abernathy, Administrative Assistant, the Urban Studies Program and the Memphis Center

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CLOUGH SESSIONS
(Anthropology & Sociology and Art and Art History)

Ethnography at Home I
Clough 204

1:30-1:45 *"Compassionate Eating": an Ethnographic Study of Imagine Vegan Café*
Becca Cook
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
The mission of Imagine Vegan Café, located in the Cooper-Young district of Memphis, is compassionate eating. Using the ethnographic method, I situated myself as a participant-observer in the café. Imagine "if you will" a small, independent, family run and family oriented vegan cafe in an old house. Unique in the way that it is run, the owners display an eclectic variety of posters on their walls, often have small children running around, and make their own rules. As a vegan of four months at the start of the study, I was curious about the greater vegan community. I observed the waiters and owners interacting with patrons, and I participated in the scene as a customer myself, getting to know the waiters and recognizing some of the patrons. Through the method of participant observation, I found that there is no one category of people that fits the description of "vegan." People of all ages and from all walks of life come to Imagine, whether they avoid animal products altogether or just want to enjoy a nice meal with friends. I have learned that there is a place for everyone at Imagine, just as there is a place for everyone in veganism.

1:45-2:00 *"We Come Here Because It's Community": Exploring the complexities and contradictions of Junior League's Repeat Boutique Thrift Store.*
Schaeffer Mallory
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
Repeat Boutique is a thrift store owned and operated by the Junior League of Memphis, a renown nonprofit that garners leadership amongst Memphis women, and seeks to translate these leadership skills into tangible improvements in their communities. The store itself is located on Summer Avenue near Highland; sandwiched into a strip of ten other businesses, Repeat Boutique is easily overlooked, but equally cherished by those that know it well. To delve into the complexities of the cultural, social, political, and economic dynamics of Repeat Boutique, I utilized the ethnographic methods of participant-observation and in-depth interview. Through immersion in the cultural scene, participant-observation allowed me to situate manifest behaviors, mannerisms, relationships, and interactions in context, thus revealing significance in the ostensibly banal. Additionally, in-depth interview with experts of the shop further nuanced and situated my observations in the subjective experiences of those that work at and frequent the store. Emerging from my observations, conversations, and interviews was the tension between Repeat Boutique as "strictly business" – indeed, the strongest arm of Junior League's fundraising – and its capacity as a communal and inclusive space wherein family, friends, and strangers gather as a respite from the gruel of a late-capitalist society.

2:00-2:15 *An Ethnography of Memphis Professional Imaging*
Ashley McGall
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
The cultural scene in Memphis is not a single amorphous entity, but instead a network of rich sub-cultures woven together to form a community. In an effort to understand one of these many sub-cultures, I have employed the ethnographic method by interacting with, participating alongside, and observing employees at Memphis Professional Imaging over the course of the past semester. This small business serves the Memphis community by developing, printing, mounting and in other ways bringing to life the many photos captured by Memphians. Whether it is professional photographers looking to get their images printed exactly to their liking or simply a family seeking to have their annual Christmas photo printed on canvas, Memphis Professional Imaging is a business that works to fulfill the needs of every Memphian hoping to avoid the one hour photo printer. I have spent many hours behind the scenes of Memphis Professional imaging, getting to know the photo printing process and its handful of employees. Using my experiences and observations at Memphis Professional Imaging, I will present this unique cultural scene with which I have become very familiar this past semester in order to share its complicated interworkings as well as its fascinating eccentricities.

2:15-2:30 *Dining through the Decades: An Ethnographic Appreciation of the Iconic Dino's Grill in Memphis*
Chloe Moore
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
A tour of the Memphis will uncover restaurants that cater to different genres, themes, group sizes, demographics, and various other cultural categories. Thus, the reputation of the city often includes its rich food culture. The fluctuating economic landscape of the city of Memphis, however, often proves fatal to small businesses and restaurants. Despite this instability, there exist some restaurants that have remained open through the decades, including Dino's Grill. Founded in 1941, Dino's- then State Café- has seen the city through many events including: WWII, the Civil Rights movements and many other historic moments. In light of the lack of longevity for small businesses in Memphis, the success of this independently owned restaurant sparks curiosity. As such, I engaged in ethnographic research, a qualitative research method used in the social sciences, to learn about this restaurant. Over the course of a semester, I engaged with my site by being a participant in and an observer of Dino's culture. Ethnography produces a detailed and nuanced understanding of a cultural scene, and my hope is that my work may shed light on the success of the restaurant as well as provide guidance for other small businesses in Memphis.

Ethnography at Home II
Clough 204

2:45-3:00 *In the Den of Makers: An Ethnographic Examination of the Midsouth Makers*
Jake Owens
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
For four months, I have attended the weekly meetups of a local engineering club called the Midsouth Makers. While in attendance I have been practicing the art of ethnography, a form of social research that provides me the opportunity to observe and participate in the activities that the group engages in every Friday night. My role in the group's meetings usually consisted of me sitting with the members and observing the process of their project creation. I engaged in the conversations that the members had regarding the direction of their projects and the latest news regarding engineering technologies. As a participant-observer at the Midsouth Makers, I feel that I obtained multiple important findings, the most relevant of which was the importance of members' engineering capabilities and interests in their conceptualization of identity in relation to the group. Group members who did not engage with computer technologies identified differently within the group than those who exclusively used computers to complete projects. These distinctions promoted diverse opinions regarding problem solving techniques. Thanks to my experience at the Midsouth Makers, I have gained a greater appreciation for the way engineers work and the ways they produce products that help us navigate daily life.

3:00-3:15 *My Months in the Mosque: An Ethnographic study of the Memphis Islamic Center*
Casey Renka
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
With all the media attention on Islam in recent years, many Americans may think they understand the religion and its followers. When they see women wearing scarves on their heads or hear people praying to Allah, they know to identify them as Muslims. But how much does knowing these facts and hearing about Islamic groups overseas actually inform us about Muslim communities here in the United States? Over the past few months, I have spent time at the Memphis Islamic Center employing the Ethnographic method of participant observation in an attempt to get to know this culture in richer detail. After many Friday afternoon sermons, classes on the Quran, morning yoga sessions, and interviews with members, I have learned much more about this community than any Search class or Fox News report could teach me. In my presentation, I will hopefully debunk some of the common stereotypes of Muslims and replace them with a nuanced, more complete portrait of one sector of American life.

3:15-3:30 *The Good, the Bad and the Ugly Mug Café*
Logan Sell
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
Ethnography is the foundational technique of cultural anthropology and has spread over the last century to many other disciplines. Any social scientific literature that analyzes a group of people within their own environment inevitably draws from this method. Ethnography is more than a means of purely academic research, however. It is also an efficacious tool for studying business and organization cultures. This semester I have conducted an

ethnography at Ugly Mug Coffee, a café that takes up the island-like space on Poplar and Perkins Extended. As both chain-based and independent coffee shops appear to exist in harmony throughout Memphis, I think it will be enlightening to study the culture of one of them in the context of how they exist and how Memphians navigate and interact with them. Over the past few months I have become a regular and endeavored to learn about the manifestations of connection and isolation in this space. I have come to understand how rapport and separation are folded tightly as DNA within the café.

3:30-3:45 *When rural invades urban: An experiment in healing through gardening*
Sierra Thompson
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
Ethnography is the skill of asking, listening, and observing respectfully in a cultural scene different from one's own. A person who is interested in the anthropological research method of ethnography is thrown into a group or setting where they are simultaneously participant and observer. In an effort to engage in the ethnographic method, I entered the world of urban gardening by volunteering at the Angelus Street Garden, a community garden under the umbrella of Grow Memphis. In its inception, Grow Memphis was created as an effort to reconcile a local community's youth and senior citizens. Its current aims are to promote local, sustainable food systems that are just, healthy, and economically viable. The Angelus Street Garden is a disruption of the normal patterns of urban life—it occupies residential space and faces commercial enterprises as a single bastion for healthy community-level food systems. The garden not only brings fresh, sustainable produce to the community that cares for it, but it is a space to reclaim power for those embedded in the web of an unjust food system. My ethnographic study has allowed me to appreciate how this "global" goal is actualized "locally" in place through physical labor and social interaction.

Artist Talks
Clough-Hanson Gallery

1:30-2:30 *Session I*
Devon Greig, Christi Haynes, Josh Mintz, and Taylor Jackson
Faculty Sponsor: Joel Parsons, Department of Art
Graduating senior studio art majors discuss their individual research, processes, and resulting artwork, which is currently on display in Clough-Hanson Gallery as part of "*of, relating to, or derived from…* the Senior Thesis Exhibition."

2:45-3:45 *Session II*
Olivia Knauss, Jingwen Luo, Emily Murphy, and Grace Porter
Faculty Sponsor: Joel Parsons, Department of Art
Graduating senior studio art majors discuss their individual research, processes, and resulting artwork, which is currently on display in Clough-Hanson Gallery as part of "*of, relating to, or derived from…* the Senior Thesis Exhibition."

FRAZIER-JELKE SESSIONS
(Art, Biology, Chemistry, Mathematics & Computer Science, Music, Physics, and Theatre)

Quantitative and Computational Science I
Frazier-Jelke A

1:30-1:45 *Computations of invariant polynomials under circular symmetries*
L. Emily Cowie
Faculty Sponsor: Chris Seaton, Department of Mathematics & Computer Science
Invariant theory is the study of the effect of a group of symmetries on a set of polynomial equations, and the polynomial elements that are mapped to themselves under these symmetries. Invariant theory has applications in a variety of areas, including Gauge theory, Coding theory, and high-energy physics. It is usually simple to find a specific invariant polynomial, and an important aspect of Invariant theory is "counting" the number of invariant polynomials of different degrees using an object called a Hilbert series. While it is simple to compute the Hilbert

series for a specific collection of symmetries, computing it in generality is challenging. This talk will give an introduction to Invariant theory and describe the computations of the Hilbert series and its first three coefficients for circular symmetries.

1:45-2:00 *Development of Inexpensive, Gesture-Based Methods to Navigate Virtual Environments*
Bryton Herlong, Aashray Singareddy
Faculty Sponsor: Betsy Sanders, Department of Mathematics & Computer Science
With modern improvements to the inexpensive head-mounted display, use of virtual reality technology in our everyday lives is quickly approaching. There is an endless number of applications for engagement in a virtual environment – from gaming and simulation, to exploring a house, museum, or even a city. One primary issue with virtual technology, however, is the difficulty that exists with navigating the environments. Haptic devices, such as game controllers and joysticks, have proven to be disorienting – causing the immersed to become "virtually lost". Other methods that track user motion as they physically walk around a room, while much more refined, are far too expensive for common distribution. The goal of our research is to uproot the issue by developing less costly methods of exploring virtual environments. We are approaching this by using inexpensive Kinect trackers to allow gesture-based movements as a means to navigation. In addition, as most methods of virtual exploration involve mechanisms that require the user to be standing – an undeniable limiting factor – we are developing a gesture-based locomotion system that allows for seated exploration of virtual environments as well.

2:00-2:15 *Collaboration in a Virtual Environment*
David Thomas, Haley Adams, Farah Sharis, Catherine Grace Jernigan
Faculty Sponsor: Betsy Sanders, Department of Mathematics & Computer Science
Virtual environments have the potential to make a huge impact in our daily lives; however, there are still many unanswered questions as to how humans are able to experience and interact with these environments. Moreover, the interaction between two people who are simultaneously experiencing the same virtual environment has not been extensively studied. The purpose of this research is to examine the cooperation of two people in the same virtual environment working together to efficiently complete a task. The experiment presented in this work shows how two subjects at a time cooperate in a search task while each viewing the virtual world through their own head-mounted display (HMD) and exploring on foot.

2:15-2:30 *Walking vs Walking-in-Place vs Flying in Virtual Environments*
Morgan McCullough, Wyatt Pease, Joel Michelson, Hong Xu
Faculty Sponsor: Betsy Sanders, Department of Mathematics & Computer Science
Over the past few years, the subject of virtual reality has been of increasing interest due to the advent of the Oculus Rift. This device greatly increased public accessibility to virtual reality due to its low price, ease of use, and compatibility with nearly every media device. However, while the Rift enables one to "view" a virtual environment it still requires that you control your digital avatar with a keyboard or other physical devices- meaning it is far from completely immersive. As such, we build upon a previous experiment which sought to increase virtual immersion by comparing flying, walking, and walking in place. We enhance the results of said experiment through the use of the recently released myo armbands in order to create a virtual reality environment that is more realistic yet still relatively inexpensive to operate.

The Natural World FJ-A I

Frazier-Jelke A

2:45-3:00 *Sexual behaviors of a female Sumatran tiger at the Memphis Zoo following Deslorelin implant*
Madeline Carwile, Beth Roberts, The Memphis Zoo
Faculty Sponsor: Sarah Boyle, Department of Biology
Rahtu is a female Sumatran tiger (Panthera tigris sumatrae) housed with a male at the Memphis Zoo. From 2007-2009, she was not recommended for breeding, and was implanted yearly with the birth control Deslorelin, a type of GnRH analogue implant. Initial testing of Deslorelin on wild and captive felids showed it to be effective and reversible in 12-18 months. Rahtu was expected to return to sexual receptivity in 2010, but has not reproduced. This study correlated sexual behaviors and urinary steroid hormones to determine if Rahtu is cycling and sexually receptive. The study found that while Rahtu exhibits cyclic sexual behaviors, her urinary estrogen is not correlated to the events, and mounting attempts by the male are not successful. The results suggest that there are residual

effects from the Deslorelin implant which are not removed between doses. Our recommendation is to attempt surgical removal and GnRH challenge.

3:00-3:15 *Morphological Characterization of Hemoparasites from Small Mammals Living in Forest Fragments in Paraguay* ◙
Aubrey G. A. Howard, Alisha Patel, Monali Lipman, Patrick Leavey III, Katharine Goebel, Sarah Boyle, Laura E Luque de Johnson, Rhodes College; Pastor Pérez-Estigarribia, Centro Multidisciplinario de Investigaciones Tecnológicas, Asunción, Paraguay; Noé de la Sancha, Department of Biolo
Faculty Sponsor: Laura Luque de Johnson, Department of Biology
The diversity and distribution of mammalian parasites can be impacted by forest fragmentation. Our study focused on the characterization of hemoparasites found in small mammals living in six forest fragments (2 to 1200 ha) in the Tapytá Private Reserve, Paraguay. Blood samples taken retro-orbitally or from the heart were prepared as smears from 134 individuals. The individuals captured represented four genera including Oligoryzomys (63.2 % of all small mammals sampled), Akodon (28.6 % of individuals sampled), Gracilinanus (6.0 % of individuals sampled), and Marmosa (2.2 % of individuals sampled). Blood smears of 67 samples were analyzed using standard histological techniques and light microscopy. We observed hemoparasitic infection in all six forest fragments and in all four genera of small mammals sampled. To date, the most common hemoparasites identified were protozoa of the Aconoidasia and Kinetoplastida classes, which were identified as both single and as co-infections. Bacterial infections were also observed. By characterizing the types of hemoparasites present in these fragments we can improve our understanding of the relationship between forest fragmentation and disease ecology, which can assist with planning more-directed conservation management plans in the future.

3:15-3:30 *Spatial Distribution of African Elephants at the Memphis Zoo* ◙
Erin Lowrance
Faculty Sponsor: Sarah Boyle, Department of Biology
The three African elephants (Loxodonta africana) at the Memphis Zoo have long been an integral part of the success of the program. Out of the three elephants, Tyranza is the matriarch and the oldest female in the group. She is 50 years old and is nearing the average lifespan of African elephants in captivity. The concern of the Memphis Zoo is the relationship of the other two elephants, Asali and Gina, after Tyranza eventually passes. I am using GIS to analyze the spatial and behavioral data of the three elephants to show hot spots of social behavior and agonistic activity. Comparing these hotspots can show areas of aggression or resource competition. With these areas isolated, the zoo can adjust their enrichment exercises or enclosure spaces so the agonistic behavior between Asali and Gina can be minimized and the transition after Tyranza's death can go smoothly.

The Natural World FJ-A II
Frazier-Jelke A

3:45-4:00 *Synthesizing LpxC Endogenous Substrate Analogues to Inhibit Lipopolysaccharide Membrane Formation in Gram-negative Bacteria*
Omair Arain
Faculty Sponsor: Larryn Peterson, Department of Chemistry
Limited treatment options exist for Gram-negative bacterial infections. This is mainly due to the extra peptidoglycan outer membrane present in Gram-negative bacteria compared to Gram-positive bacteria. This membrane is composed of lipopolysaccharides (LPS). Lipid A, a main component of LPS, causes bacterial virulence and pathogenicity. LpxC is the enzyme responsible for catalyzing the first committed step in Lipid A's biosynthetic pathway. Therefore, this enzyme is an efficient target for the purpose of inhibiting the synthesis of Lipid A thereby inhibiting the formation of LPS. This research is focused on synthesizing derivatives of the endogenous substrate for LpxC in order to develop an original broad-spectrum inhibitor. Analogues that have been studied contain uracil bound to a ribose sugar that is connected to an amino acid containing hydroxamic acid. Methods to connect to the amino acid that have been investigated include an ether linkage, a triazole linkage, and a thioester linkage, the main focus of this study. This is due to the natural occurrence of thioester bonds in the body. The synthesis of the analogue containing the thioester linkage will be discussed.

4:00-4:15 *DFT analysis of water clusters, dopaminergic derivatives, and their desolvation energies* ◙
Mallory Morris, Katie Hatstat; Mauricio Cafiero, Larryn Peterson, Department of Chemistry, Rhodes College
Faculty Sponsor: Mauricio Cafiero, Department of Chemistry
The catechol-O-methyltransferase enzyme is responsible for the metabolism of the neurotransmitter dopamine, a catecholamine involved in the degenerative disorder known as Parkinson's Disease. One treatment for Parkinson's disease is L-DOPA therapy, where this dopamine precursor is transformed into dopamine by DOPA decarboxylase. The dopamine derived from L-DOPA is degraded by COMT; therefore, inhibiting COMT would be ideal to prolong the effectiveness of L-DOPA and to increase pharmacological efficiency by preventing the premature metabolism of the medication. Computational models of dopaminergic analogs were used to examine the substrates' binding in the enzymatic active site. The binding of a ligand to an enzyme not only involves the interaction between the ligand and the enzyme but also the energy lost or gained by desolvation of the ligand. Desolvation of dopaminergic derivatives was examined using a series of hydration shells that increase in size. The desolvation energies were calculated using M062X with the aug-cc-pvdz and cc-pvtz basis sets. Ligands with the carboxylic acid and nitrile substituents exhibited the greatest desolvation energies in each of the explicit water models. This information will be combined with prior research done on ligand/enzyme interaction in order to get a more comprehensive understanding of ligand binding in this system.

4:15-4:30 *Design and Synthesis of 6-Carboxydopamine for Analysis of SULT1A3 Selectivity* ◙
Jennifer Rote Gabrielle E. Bailey, Mauricio Cafiero, Larryn W. Peterson
Faculty Sponsor: Larryn Peterson, Department of Chemistry
Human cytosolic sulfotransferases (SULTs) catalyze the transfer of a sulfate group (-SO3-) from 3'-phosphoadenosine-5'-phosphosulfate to the hydroxyl group of an acceptor substrate. SULTs increase the water solubility of many endogenous substances and xenobiotic compounds, regulating their metabolism and aiding in excretion. Despite structural similarities, each sub-family sulfates distinct substrates. The SULT1A1 sub-family targets phenolic compounds, while SULT1A3 sulfates catecholamines. Reasons for such substrate specificity are poorly understood, although specificity may be regulated by Asp and Glu residues in the active site of SULT1A3. To investigate the factors that influence SULT1A3's substrate selectivity, dopamine analogues were synthesized with either a modified ethylamine tail moiety or with substituents at the 6-position of the molecule of varying sizes and degrees of electron withdrawing and donating capabilities. Optimizing the synthesis of the 6-carboxy analogue has been of recent focus. The design and synthesis of this dopamine analogue will be discussed.

4:30-4:45 *MP2 and DFT analysis of the ligand selectivity of a sulfotransferase enzyme: SULT 1A1*
Amelie Weems, M. Cafiero, L. Peterson
Faculty Sponsor: Mauricio Cafiero, Department of Chemistry
We have studied the substrate selectivity of the sulfotransferase enzyme (SULT1A1) by identifying important protein-ligand interactions in the active-site through electronic structure calculations. The sulfotransferase enzymes (SULTs) catalyze the addition of a sulfate group to a variety of small molecules, including neurotransmitters and xenobiotics. This reaction can activate or deactivate bio-active molecules or change their pharmacokinetic behavior. A variety of ligands analogous to known substrates of the SULT were chosen for study. Docking and M062X/6-31G optimization of the ligands were used to find the structures of the ligand-protein complexes assuming a static active-site. Interaction energies between the ligands and the amino-acids of the active-site were calculated using MP2 and M062X with 6-311+g*; these energies can be used to determine the thermodynamic stability of the ligand in the active site. The addition of the sulfuryl group to the ligand depends on deprotonation of a phenol group on the ligand. Thus, pKa values were calculated for each of the ligands to determine the ease of deprotonation. Interaction energies and pKa values indicate different selectivity and comparison with experimental values is being used to determine which approach is most accurate. All calculations were run with and without implicit solvent.

Acting and Performance

Frazier-Jelke B

1:30-2:00 *U.R.C.A.S & C.U.P: The Perfect Marriage of Acronyms*
Lara Johnson, Jim Bugg, Katie Cannon, Conor LaRocque, Emily Marcho, Casey Myers-Morgan, Luke Newman, Tom Simmermaker, Andrew Wiliams
Faculty Sponsor: Julia Ewing, Department of Theatre
Contents Under Pressure (CUP) has existed for more than fifteen years as the select improvisational (improv) troupe on Rhodes College campus. During that time the troupe has produced more than one hundred shows, all of which have been free and open to the public. After submitting a proposal to the Center for Outreach in the Development of the Arts (CODA), we were given the opportunity to explore various forms of improv comedy in Chicago. Chicago has long been the standing center for improv comedy in the United States. During our time in Chicago, we sampled six forms of improv and engaged in a long-form comedy workshop with Thomas Kelly, a improv professional and member of the troupe SAND. After our return, we have prepared a performance which couples our prior experience with improv acting and those techniques which we learned while in Chicago.

Audio-Visual

Frazier-Jelke B

2:15-2:30 *Country, Health, and Beethoven's 'Pastoral' Symphony*
Ethan Lawler
Faculty Sponsor: Vanessa Rogers, Department of Music
This research investigates the motivation behind the "Pastoral" motifs in Ludwig van Beethoven's 6th Symphony. The symphony is his only outwardly programmatic symphony, musically depicting the composer's love of the German countryside and forests, yet very little has been written on the specific motivations behind Beethoven's decision to depict nature in this piece. By investigating the composition of the 6th symphony along with popular Romantic forest symbolism and Beethoven's personal writings, his motivations become clear. In addition, the themes in the 6th Symphony and Beethoven's letters provide insight into the popular myths of the German Forest and countryside. This research relies most heavily on primary source material including a recording of the 6th Symphony, the Heiligenstadt Testament, and other important writings of Beethoven. I show that the 6th Symphony is strongly linked to the Heiligenstadt Testament and the specific ways in which his hearing loss motivated his symphony, specifically that the countryside represented a place to heal both physically and mentally.

2:30-2:45 *From Come and See to Who's the Dope?: A Fellowship Year Adventure in 19th-century Theatre, Travel, and TEI Encoding* ◙
Kaitlyn Shamley, Tea Rose Pankey, Jonathan Cavell
Faculty Sponsor: Vanessa Rogers, Department of Music
What was staged during the theatrical season of 1814-1815 in London? This is the question that we were assigned by our Fellowship colleagues at the University of Oxford, the sponsors of the international theatrical database The London Stage, 1800-1900. We were responsible for examining each day of the London Times in order to find out the answer, and what we discovered was that Napoleon was still very much a concern, that America was beneath notice, and that theatrical life went on at an astonishing rate. With the recent invention of gaslight in the theatre (which ignited an ongoing controversy in the papers), audiences could better see offerings like The Tiger Horde, "the Equestrian Melodramatic Spectacle" or Billy Button's Journey To and From London, "a Serious Comic Extravaganza." During this year, we travelled to Oxford and learned TEI encoding in order to support this original research and disseminate it through the global London Stage 1800-1900 database.

2:45-3:15 *TV Time (A Short Film)*
Emily Heine, Lara Johnson
Faculty Sponsor: Elizabeth Daggett, Department of Art
Lara Johnson and Emily Heine present a short narrative comedic piece produced under the guidance of Liz Daggett. The culmination of this film emerged out of a desire for normative female casts- something that seldom exists in the film industry. Lara and Emily noticed the lack of films that solely devote themselves to women's issues and acknowledged that when these films do seem to present themselves, they are rarely portrayed completely by women. Instead, these products rely on male actors and their characters to carry the theme. By way of an all female cast (cast

and crew included), Lara and Emily hope to elicit a response that challenges it's abnormality. They seek to shed light on a male dominated field and prove that women can live up to the standard without using men to captivate an audience and/or verify their worth. By utilizing the community with which Lara and Emily interact (both Rhodes and the greater Memphis area), they hope to empower all of the women who become apart of the process and final product.

ART 114 Film Screenings

Frazier-Jelke A

3:30-5:30 *ART114 Digital Art: Motion Images*
Hannah Asbell, Robyn Barrow, Ellen Booras, Katie Cannon, Justin Cates, Amanda Crist, Marissa Evans, Cassandra Golden, Alexandra Greenway, Sooji Hong, Hope Hudson, Tea Rose Pankey, Liisa Ratsep, Alexandra Rawlings, and Aaron Vancil
Faculty Sponsor: Elizabeth Daggett, Department of Art
The ART114 Digital Art: Motion Images class present a mix of narrative, documentary, and animated shorts films, each 3-10 minutes long.

The Natural World FJ-C I

Frazier-Jelke C

1:30-1:45 *Characterizing Strain-Specific H5 Influenza Virus Replication in Macrophages* ◙
Teddy Huerta, Rhodes College, Shauna Marvin,Troy Cline,Joe Johnson,Erik Karlsson,Bradley Seufzer,Stacey Schultz-Cherry, Department of Infectious Diseases, St. Jude Children's Research Hospital
Faculty Sponsor: Gary Lindquester, Department of Biology
Highly pathogenic H5N1 influenza virus infections are associated with severe respiratory damage and high morbidity and mortality in infected humans. Due to the critical role that macrophages play in response to respiratory pathogens, investigating such viruses' ability to evade or exploit the innate immune response can provide greater insight into macrophage function at the host-pathogen interface. Unlike H5 viruses, we found that all non-H5 influenza virus strains including the 2009 H1N1 pandemic virus experience a block upstream of nuclear entry and escape and are unable to productively replicate in macrophages. Specifically, these viruses are prevented from exiting lysosomal (LAMP1) compartments. However, only highly pathogenic H5N1 strains could successfully produce new viral protein synthesis and progeny release. Furthermore, it was found that the pH of fusion of hemagglutinin (HA), not sialic acid receptor binding, influenced replication. On a functional level, it was shown that while reactive oxygen species (ROS) were not produced during viral infection, macrophage phagocytosis was significantly impaired by productive viral replication. Future studies will focus on elucidating the molecular mechanism(s) of these blocks in differential H5 virus-specific replication, and the overall effect of viral replication in macrophages on influenza virus pathogenesis.

1:45-2:00 *Expression, refolding, and purification of Bone Morphogenetic Protein 4 (BMP4) for potential use as an anticancer therapeutic agent* ◙
Emily Hayward, Rhodes College; Krystal Herline, Steve Finckbeiner, Cristina Guibao, Jie Zheng, Department of Structural Biology, St. Jude Children's Research Hospital
Faculty Sponsor: Laura Luque de Johnson, Department of Biology
Although Bone Morphogenetic Protein 4 (BMP4) was originally noted for its ability to induce bone formation and repair, recent research has discovered that both under-expression and overexpression of BMP4 can contribute to cancer. For the cancers in which BMP4 is under-expressed, the protein itself may be a promising therapy. A 2013 study used a viral vector to administer BMP4 to mice with glioblastoma multiforme, an aggressive brain tumor with a high relapse rate. After BMP4 treatment, 100 percent of the mice survived and there were no instances of tumor recurrence, suggesting that BMP4 could be a powerful anticancer agent. However, BMP4 is expensive and does not exist in a highly pure and stable form that can be used in human medicine without severe side effects. Current work in the Zheng Lab utilizes the cost effective and easily accessible model organism Escherichia coli (E. coli) to overexpress BMP4. Various purification methods, including affinity column chromatography, were then implemented to develop a purer, more stable form of BMP4. Assays in eukaryotic cell lines have recently confirmed the successful production of active BMP4 from E. coli inclusion bodies, and this protein will be investigated further as a potentially novel anticancer therapeutic agent.

2:00-2:15 *Role of copper homeostasis in the pathogenesis of Streptococcus pyogenes*
Tina Dao, Rhodes College; Michael Johnson, Jason Rosch, Department of Infectious Diseases, St. Jude's Children Research Hospital
Faculty Sponsor: Loretta Jackson-Hayes, Department of Chemistry
Metals, such as copper, serve as cofactors of many crucial proteins in various cellular processes. However, copper also has antimicrobial properties. The mammalian host exploits copper's antimicrobial properties to kill bacteria during the innate immune response. Thus, copper efflux mechanisms have been highly conserved in bacterial systems in order to minimize toxicity. Previous studies have shown that Streptococcus pneumoniae ΔcopA mutants are hypersensitive to excess intracellular copper, confirming that this gene encodes a copper exporter. S. pneumoniae and Streptococcus pyogenes share many similarities such as the ability to cause pneumonia, bacteremia, and lyse blood cells. Currently, there are no published studies on the role of the copper efflux pump and the mechanism of copper-mediated toxicity in S. pyogenes. In this study, an in-frame deletion in copA (SPy_1715) was constructed in S. pyogenes HSC5 wild-type strain. This mutant, termed ΔcopA, universally showed increased sensitivity to copper as compared to the wild type. The ΔcopA mutant was attenuated, creating significantly smaller lesions 24- and 48-hours post-infection in SKH1 hairless mice. The upregulation of czcD, which encodes a zinc exporter, under copper stress suggests there is a crosstalk between the copper and zinc efflux systems. Data presented here on the role of the S. pyogenes copper efflux system in virulence and metal homeostasis will be beneficial in developing future therapeutic strategies to reduce streptococcal infections.

2:15-2:30 *Design and synthesis of inhibitors of the LPXC enzyme*
Carolyn Dishuck, Kayla Wilson, Allison J.L. Dewar, Larryn Peterson, Mauricio Cafiero
Faculty Sponsor: Mauricio Cafiero, Department of Chemistry
In recent years bacterial infections have become more resistant to treatments, posing a challenge for both researchers and health professionals. Gram-negative bacteria present a challenge due to the presence of a selectively permeable outer membrane. The enzyme LpxC is responsible for catalyzing the first committed step in the biosynthetic pathway of Lipid A, a component of the outer membrane. The inhibition of LpxC would therefore, prevent the production of Lipid A, and hence result in a corrupted outer membrane. Starting from a LpxC crystal structure with a natural substrate bound in the active site, we have docked several novel ligands in the active site. The structure for these ligand-protein complexes were optimized using m06l and the 6-31G basis set (and lanl2dz for zinc) both in vacuo and in solution phase. Interaction energies for the ligand and protein complex were calculated using m06l and mp2 with the 6-311+G* basis set (and lanl2dz for zinc). Initial suitability studies were done to confirm that our model chemistry described the zinc binding in the protein appropriately. In addition, the synthesis of components of the proposed ligands is underway, specifically focusing on the hydroxamic acid portion of the proposed inhibitors.

The Natural World FJ-C II

Frazier-Jelke C

2:45-3:00 *DFT and MP2 analysis of ligand selectivity in the catechol-O-methyltransferase enzyme* ◙
Katie Hatstat, Dr. Larryn Peterson, Mallory Morris
Faculty Sponsor: Mauricio Cafiero, Department of Chemistry
L-DOPA is commonly used as a xenobiotic for patients with conditions such as Parkinson's disease. L-DOPA is transformed into dopamine by DOPA-decarboxylase. Dopamine derived from L-DOPA is deactivated via metabolism by the COMT enzyme. The targeted inhibition of the COMT enzyme prolongs the effectiveness of L-DOPA, resulting in a net increase in pharmacological efficiency. By selectively designing an inhibitor for the catechol-O-methyltransferase enzyme, the effectiveness of the L-DOPA can be extended by regulating the metabolism of dopamine derived from L-DOPA. The effectiveness of these dopaminergic derivatives has been measured via in silico models in which the strength of interaction between each substrate and the enzymatic active site was analyzed. A crystal-structure of the COMT enzyme active site, docked with a known COMT inhibitor, BIA 8-176, was isolated from the Protein Data Bank (PDB ID: 2CL5). Novel dopaminergic derivatives were optimized using M062X/6-31G in vacuum and in implicit solvation with rigid amino acid side-chains. Interaction energies between the ligands and the protein were calculated using M06L and MP2 with the 6-311+G* basis set. Ligands with a nitrile substituent were favored over other substituent variations in vacuum, but this preference was not retained when the same ligands were optimized with implicit solvation.

3:00-3:15 *Diagnosing osteoporosis with ultrasound: 1 MHz backscatter density and structure measurements*
P. Luke Spinolo, Brent Hoffmeister, Rhodes College; Sang-Rok Lee, Department of Health and Sport Sciences, University of Memphis; Jinsong Huang, College of Medicine, University of Tennessee Health Science Center
Faculty Sponsor: Brent Hoffmeister, Department of Physics
Osteoporosis is a degenerative bone disease affecting a significant percentage of the population over 50. The current standard for diagnosis is DXA, an x-ray technique, but we believe ultrasound could offer a cheaper, more portable diagnosis method that may also be sensitive to bone strength in ways DXA is not. Our lab has previously developed analysis techniques shown to correlate backscattered ultrasound signals from trabecular bone with bone density, working at the 5 MHz range. These techniques take a power ratio between an earlier and later part of the backscatter signal. Because signal loss between the two regions is sensitive to attenuation in the bone and attenuation correlates with bone density, these ratios (called nMBD in the frequency domain or nBAR in time) also correlate well with density. This study used a 1 MHz transducer with these analysis methods, thereby increasing signal penetration into bone. We also investigated correlations between nMBD and nBAR and bone characteristics, including structural modeling index (SMI) and trabecular number (TbN). Good linear correlation coefficients were observed for nMBD and nBAR vs bone density at r=0.75 and r=0.7, respectively, comparable to correlations working at 5 MHz. Correlations with SMI and TbN were within the r=0.65-0.75 range.

3:15-3:30 *Effects of implicit solvation, relaxed amino acid side chains, and point mutations on the MP2 and DFT calculations of ligand-protein structure and interaction energies of dopaminergic ligands in the SULT1A3 enzyme active site.* ◙
Diana Bigler, Larryn Peterson, Mauricio Cafiero
Faculty Sponsor: Mauricio Cafiero, Department of Chemistry
We have studied the substrate selectivity of sulfotransferase SULT1A3 by identifying significant protein-ligand interactions in the active site through modeling. Sulfotransferases are involved in the regulation of neurotransmitters and hormones as well as the metabolism of drugs and other xenobiotics. Eight dopaminergic ligands and resveratrol are the focus of this study and with electronic interaction energies calculated using MP2 and M062X with the 6-311+G* basis set. Optimizations and calculations were performed in three ways: in vacuo with rigid amino acid residue side chains, with implicit solvation with rigid amino acid residue side chains, and with implicit solvation by water with relaxed amino acid residue side chains. The calculations indicate that using an implicit solvent and relaxed active site results in stronger binding in ligand interaction energies. The dopaminergic ligand with the strongest interaction energy of the ligands studied is 6-carboxydopamine; three other ligands—6-cyanodopamine, 6-hydroxydopamine, and 6-bromodopamine—exhibit stronger interaction energies than the endogenous ligand, dopamine. Using the solvated-relaxed model, computational site-directed mutagenesis was performed on two amino acid residues within the SULT1A3 active site, D86A and E146A, to compare with experimental results.

Quantitative and Computational Science II

Frazier-Jelke C

3:45-4:00 *Rhodes Housing Selection: Online Edition*
Andrew Tackett, Patrick Cudahy, James Simpson, Alex Wang
Faculty Sponsor: Betsy Sanders, Department of Mathematics & Computer Science
This presentation will be a demonstration (and explanation of the creation) of our web page, an online version of Rhodes College's housing selection system. In order to fix the inefficiencies of the current housing system, we have created a system in which students can form groups with their classmates, look up the floor plans (complete with nearly every room's dimensions), and select their room – all online. Administrators can also add and remove students from rooms manually. This web page, if implemented by Rhodes College's faculty, could make room selection an easy and painless process for everyone involved.

4:00-4:15 *Agent-Based Model of Yellow-Bellied Marmots* ◙
Shushangxuan Li, Erin N. Bodine, Rhodes College; Adam Pratt, Anne Yust, Birmingham Southern College
Faculty Sponsor: Erin Bodine, Department of Mathematics & Computer Science
From 2000 to 2008, yellow-bellied marmot populations in the Upper East River Valley, in Gunnison County, Colorado, experienced a rapid increase in size. After multiple long-term studies, researchers have attributed the

dramatic increase in population size to climate change. Shorter winters have allowed marmots to accumulate more fat during the active season, leading to a decrease in mortality during hibernation, and an increase in fecundity. We present an agent-based model that explores the affects of climate change on yellow-bellied marmot populations.

4:15-4:30 *A Polyphonic Model for Computational Music Analysis*
David Thomas
Faculty Sponsor: Phillip Kirlin, Department of Mathematics & Computer Science
Trying to algorithmically create a realistic musical analysis is still a difficult problem. Currently, a monophonic computational model creates positive results, but our belief is that it can be improved upon. In this paper, we present an extension to the previously mentioned approach by changing the data model from monophonic to polyphonic. In addition, we examined the sensitivity of the analyses due to rests within the music. This gives us a probabilistic model that is also capable of analyzing polyphonic music.

"Point of View" Photograph Display
Frazier-Jelke Lobby

2:00-2:30 *Point of View*
Francesqa Santos, Erica Hadley, Celia Mason
Faculty Sponsor: David Mason, Department of Theatre
Point of View is an installation piece that features photographs from a 6-day trip to Trinidad, in which students and faculty studied the ways in which the Hindu community of Trinidad-Tobago celebrates its own counterpart of an important Hindu festival, Holi. The Hindu Prachar Kendra, an institution at the center of Trindad-Tobago's Hindu population, invited the Rhodes group to come and partake in their Phagwa festival. The Hindu population has existed in Trinidad for over 175 years and a look at their customs and community provide an insight to the fluidity and transient nature of their festival. Songs from the Prachar Kendra's Phagwa performance will be featured to give life to the theatrical elements in Hindu festival. The installation provides a tactile experience of a festival that combines theatrical elements with community events, giving way to an incredible cultural experience.

HASSELL SESSIONS
(Music)

The Cauthen Competition
Tuthill Performance Hall

1:00-3:00 *The Cauthen Competition*
Faculty Sponsor: Leah McGray
Gladys Cauthen was one of the founding influences in the development of Rhodes' Department of Music. The Cauthen Competition is a soloist competition that is open to any Rhodes student taking applied music lessons, reflecting Cauthen's support of individual musicianship while studying at Rhodes. In addition to a monetary prize, the winner of each year's competition wins the opportunity to perform as the featured soloist with the Rhodes Orchestra in the following academic year.

Judging will begin at 1:00, with the final results announced at the end of the program, approximately 3 p.m. Rhodes community members are invited to come by and listen to these wonderful musical offerings.

KENNEDY SESSIONS
(Economics, International Studies, Political Science, and Urban Studies)

Home and Abroad
Kennedy 205

1:30-1:45 *State of Arkansas vs. Terry Hobbs*
Micah Cohen
Faculty Sponsor: Anna Smith, Department of Political Science
On the morning of May 6th, 1993, the naked, bound, and mutilated bodies of three eight year old boys were found in the Blue Beacon Woods of West Memphis, Arkansas. Three local teenagers were wrongly convicted of the crime, sparking the Paradise Lost documentary trilogy and remaining one of the most egregious miscarriages of justice in the country's history. The identity of the real killer has remained a mystery, but over the years evidence has accumulated pointing to Terry Hobbs-including a hair, a matching bite mark, and two witnesses who heard two confessions. On April 26th, 2014, I put all of this evidence-some of which was not disclosed to the public until my trial-together, in the form of a mock trial of prime suspect, victim's stepfather and Memphis resident Terry Wayne Hobbs.

1:45-2:00 *The Road to Victory: An in depth analysis of contemporary congressional campaigning through the 2014 Tom Cotton for Senate Campaign.*
Rachel E. Harris
Faculty Sponsor: Amy Jasperson, Department of Political Science
Through analysis of relevant literature and first-hand experience working on the 2014 Tom Cotton for Senate Campaign, I will research various components of contemporary congressional campaigning. With an analysis of money and finance, political advertising, news coverage, voter mobilization, and overall candidate campaign strategy, I will attempt to uncover what specific factors lead to the Cotton victory and the Pryor defeat in the 2014 Arkansas Senate Race. Through this analysis, I hope to determine what factors are essential to electoral success so that they can be applied to future campaigns.

2:00-2:15 *Celebrity Politicians as a Unique Yet Effective Tool in the Political Process*
Jolie-Grace Wareham
Faculty Sponsor: Renee Johnson, Department of Political Science
In an age of increased connection to celebrities through social media and other platforms, this paper utilizes Country Music Television's Empowering Education campaign as a case study to explore the significance of celebrity in political processes. It is undoubted that the notion of celebrity plays a role in the policymaking process. Nevertheless, this concept has seen little research attention. In his article for the British Journal of Politics and International Relations, John Streets explains that celebrity politicians are divided into two categories: those politicians that take on celebrity-like roles and those celebrities that take on politician-like roles (Streets). My inquiry focuses on the second type of celebrity politician. Using Country Music Television's (CMT) Empowering Education (EE) campaign as a case study, this inquiry seeks to uncover the political significance of celebrities taking on political roles. I will build upon research I have already begun regarding CMT's selection and utilization of country music star Dustin Lynch as a spokesman for the EE campaign and the effects this use of celebrity has on advocacy for higher education specifically and education generally. While Streets provides an overview of this idea, a deeper inquiry of this notion in the context of contemporary American politics will be helpful in realizing the most effective ways to utilize the tool of celebrity when seeking to further policy, advocate for an issue, or elect a candidate.

2:15-2:30 *Symptoms of Depression and Social Support Systems in the Postnatal Period for Syrian Refugee Women in Jordan* ◙
Annika Gage
Faculty Sponsor: Barron Boyd, Director of International Programs
Very little literature has focused on the postnatal period for women have fled their homes and are living as refugees in foreign countries. There is none that discusses the mental health of Syrian mothers during this stage who are currently living (in 2014) as refugees in Jordan. This study seeks to illustrate depressive symptoms for these mothers at a single point in time in their postnatal period, as correlated to the woman's perception of her own social

support systems. The Beck Depression Scale and Multidimensional Scale of Perceived Social Support were used to measure this. Descriptive statistical analysis was used. Bivariate correlation analysis was conducted to examine the relationship between variables. The result revealed that the Syrian refugee women reported moderate depression. The Significant Other support subscale (mean=20.6, SD=3.9) and Family support subscale (mean=17.9, SD=5.1) were ranked the highest means among all social support subscale scores. There was no significant correlation at $p<0.05$ between total depression score and total perceived support scale. This study still has implications for the necessity of increased healthcare services available to Syrian refugee mothers, and support groups in order to help new mothers build friendships and receive emotional care.

2:30-2:45 *Journey to Jannah: The Women Leaving The West to Join Terrorist Organizations*
Veronica Francis
Faculty Sponsor: Esen Kirdis, Department of International Studies
This summer, a new terror threat rose in the Middle East, the Islamic State of Iraq and Syria, better known as ISIS. As time went on, it became apparent that more and more foreigners, especially women, were flocking to the Turkish border in an attempt to cross over into Iraq and Syria to join ISIS. What was even more fascinating about these Western women joining ISIS was that they were often well educated and affluent with moderate parents. This paper studied why these women joined an organization like ISIS that is known for its mistreatment of women by looking at what these women have written about their journey and life under ISIS on social media accounts and what instructions they have posted on how to join ISIS. In light of primary research, the study finds that these women left their homes in the West looking for a purpose and community where they would not be discriminated against. ISIS, through its social media use, has drawn Muslim women from across the world who feel out of place and offered them a life with the promise of power and inclusion.

Our World at Work
Kennedy 205

3:00-3:15 *The Arts as an Economic Stimulus*
Taryn Burgess
Faculty Sponsor: Nick McKinney, Department of Economics
General trends show that Americans over the past few decades have increased their consumption of cultural entertainment, particularly, theatre and live non-profit entertainment. Americans for the Arts CEO in his National Summary Report stated, "America's artists and arts organizations live and work in every community coast-to-coast—fueling creativity, beautifying our cities, and improving our quality of life." But do the arts actually aid in the economic revitalization of communities? In order to understand the revitalizing effects of the arts, I researched the relationships between the presence of the arts in US counties and key economic indicators, including education levels, household incomes, and the presence of related industries, such as retail and food services. There proves to be positive relationships between healthy economic indicators and counties with well-established art communities. An increase in the number of art establishments increases employment in retail and food services. Counties with large arts communities have more educated citizens. Also, arts entertainment seems to attract professionals involved in the sciences, who Richard Florida, urban studies theorist, calls the creative class. These relationships help us better understand the economic effect of the arts and to direct future efforts to improve the economic well being of our communities.

3:15-3:30 *Impact of Crime on Social Capital and Beliefs in Democracy: A Study of Argentina*
Mary Cadden
Faculty Sponsor: Nick McKinney, Department of Economics
This paper focuses on how crime, perceptions of insecurity, and corruption may affect an individual's trust in the institutions in place as well as trust in other members of society. We take this a step further and examine whether these factors also affect an individual's inclination towards less-democratic, authoritarian regimes in an attempt to combat feelings of insecurity through harsher criminal punishments. The conclusions drawn in this study of Argentina support previous findings that when individuals feel more insecure or have been victims of crime, they tend to have less trust in institutions. Our findings also support that individuals are more likely to support authoritarian or mano dura practices if they have less trust in governing institutions. Therefore, insecurity and violence are important factors to address when attempting to keep stable, successful democracies in place.

3:30-3:45 *Do Food Deserts Matter? A Hedonic Analysis*
Monica Costello
Faculty Sponsor: Courtney Collins, Department of Economics
In this paper we use United States Census Data from Shelby County, Tennessee to determine whether access to a sufficient food source has an economic effect on housing prices. We use a hedonic pricing model with a data set containing 3,298 observations to determine the effects. To measure access to a grocery store we use a dummy variable that is equal to one if the house is located in a neighborhood is considered a food desert, and equal to zero if the neighborhood is not considered a food desert. According to United States Department of Agriculture standards regarding food deserts; a neighborhood in an urban area is classified as a food desert if it is one or more miles from a grocery store. Additionally, neighborhoods in rural areas are considered food deserts if they are ten or more miles from a grocery store. Our Ordinary Least Squares regression estimates that on average, house prices are 7.24% percent lower if the house is located within a food desert.

3:45-4:00 *President Compensation at Private Universities and Colleges*
Olivia Hebner
Faculty Sponsor: Steven Caudill, Department of Economics
In this study, we explore the determinants of total compensation of presidents at private institutions in the United States and further examine potential cases for race and gender discrimination. We use both ordinary least squares and fixed effects regressions to test the factors that affect total compensation. We collect compensation data from The Chronicle of Higher Education for 1998-2011 and pair this with institutional date from the Integrated Postsecondary Education System. Preliminary results indicate that non-white university presidents actually earn more than their white counterparts, after controlling for school-specific characteristics.

4:00-4:15 *The Economics of Amateur Sports: Finding the Marginal Revenue Product in Gaelic Football*
David Adolphus Pettiette
Faculty Sponsor: Courtney Collins, Department of Economics
This paper focuses on finding the marginal revenue product from athletes competing in the All-Ireland Senior Football Championship. Gaelic football is an amateur sport under the sponsorship of the Gaelic Athletic Association in Ireland and surrounding countries. Despite regulations requiring all sports under the GAA are to be amateur, the organization still collects gate revenues along with other television and advertising endorsements. This study set out to find the marginal revenue product of the top 25 scorers in the All-Ireland Senior Football Championship in the years 2013, 2012, and 2009. Our results revealed that on average, the top scorers generated a MRP of €225,896.57.

4:15-4:30 *Athletic Performance and Academic Selectivity in Postsecondary Institutions: Does Athletic Success Improve Admissions Outcomes?*
Ben Priday, Chelsea Temple
Faculty Sponsor: Courtney Collins, Department of Economics
Few empirical studies have explored the relationship between collegiate athletic performance and schools' academics. In this paper, we examine the effect of NCAA Division I, II, and III football programs on the quantity of applications and enrollments, as well as the academic selectivity and demographic makeup of post-secondary institutions. We use several measures of athletic success, including win percentage, conference performance, and placement in the Associated Press (AP) College Poll. Our academic and admissions data comes from Peterson's Undergraduate Licensed Data Set for the years 1998-2013. Using school fixed effects and accounting for general admissions trends across time, we estimate admissions models for different several different types of schools. Preliminary results suggest that placement in the top 20 of the AP Poll significantly increases a school's applications, but that the effect may occur with a lag.

Urban Studies Senior Seminar: Urban and Community Health

Kennedy 208

1:30-1:40 *Dispersal of the Flock in South Memphis: Mapping the Distances between Church and Home*
Caroline Clark
Faculty Sponsor: Elizabeth Thomas, Urban Studies Program
Although there is extensive research describing urban sprawl, urban mapping, and congregational health, this project bridges these separate conversations. The work begins by describing the research setting: Memphis, TN where

economic flight and discriminatory policies have created racialized pockets of poverty and poor health. Racial and economic disparities manifest in chronic disease and poor access to healthcare. A community asset-mapping program, the Congregational Health Network (CHN), subverts these disparities by connecting local churches with healthcare resources. The CHN, however, does not have data specifically about how Memphis's inner city's fragmentation impacts their congregation partners. This project uses a combination of interviews and urban mapping to connect urban sprawl with congregational health. South Memphis stakeholders were interviewed at churches that utilize the CHN. These interviews were compiled into a traditional narrative, as well as into a Geographic Interface System map (using Tiger/Line shapefiles) showing the neighborhoods where congregations come from. This map describes the influence of urban sprawl: the long-distance congregations within inner city churches and the fragmentation of inner city neighborhoods. The work is intended to contribute to the Congregational Health Network's work in Memphis, as well as push together academic conversations about congregational health and urban sprawl.

1:40-1:50 *"They Saw Me as a Person": The Church Health Center and Patient-Centered Care*
Alex Galloway
Faculty Sponsor: Elizabeth Thomas, Urban Studies Program
To face the most pressing issues in the health of American people, healthcare institutions are employing innovative strategies to combat chronic diseases like diabetes. The Church Health Center in Memphis, Tennessee is committed to providing care for the working uninsured and encouraging healthy bodies and spirits for all. The Church Health Center's model is unique because of their holistic approach to health care and wellness. The exploration of individual experiences in the Church Health Center's programs can illuminate some of the facilitators and barriers to health behavior changes. This project will code transcribed interviews with twenty individuals who participated in an intensive 18-month Healthy Living Program for people with diabetes. Focusing on the participants' interactions with the Church Health Center staff, this project uses the concept of patient-centered care - care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions - to categorize the responses of the participants. This project hopes to expand the notions of patient-centered care to include additional factors of health behavior change. Healthcare administrators and providers can utilize these findings to approach health care delivery more holistically.

1:50-2:00 *"The Throwaways Still Get Thrown Away;" Federal Policy Recommendations and the Necessary Transition of Approaches to Infant Mortality from Medical to Social*
Aubrey Kearney
Faculty Sponsor: Elizabeth Thomas, Urban Studies Program
The United States has the highest infant mortality rate of any developed country despite continuous improvement to quality of health care. There are limitations of medical care in reducing infant mortality rates, especially as this rate in the United States is more and more clearly created by social dynamics such as poverty and racism. Communities of color and poverty are also often held responsible for this rate, rather than supported. This acknowledgement of extreme disparities based on income level and race as a primary factor distinguishes these policy recommendations from historical efforts to reduce the infant mortality rate. Popularized as the Infant Mortality Capital of the United States, Memphis, Tennessee serves as an interesting case study and point of comparison between local and national level approaches to infant mortality. The interviews that I have conducted with professions addressing the Infant Mortality Rate from various fields and levels of reach since October 2014 will guide and support the policy options and recommendations that I will present. I will explain the complexity and significance of lowering the infant mortality rate, offer three policy options based on my interviews and research, and conclude with recommendations considering strengths and weaknesses of the presented options.

2:00-2:10 *Strategies to incorporate culturally competent care into clinical treatment plans for Arab Muslim immigrants with diabetes*
Hajar Sakhi
Faculty Sponsor: Elizabeth Thomas, Urban Studies Program
At 12%, Shelby County has a higher prevalence of diabetes compared to the national average of 8% (Diabetes for Life Memphis, 2012) and is particularly fatal in Memphis' communities of color with these populations comprising 72% of diabetic fatalities (Shelby County Tennessee, 2010). As a preventable and treatable illness, the severity of diabetes is often underestimated by health seekers, but can ultimately lead to strokes, amputations, blindness, and death; adherence to medication and lifestyle changes, like diet and exercise, are imperative to avoid these complications. A key component that contributes to the lethality of type II diabetes among Arab immigrants in the

United States in particular is the noncompliance of prescription medication due to existing cultural and religious beliefs and psychological barriers to behavioral change. This paper aims to elaborate on these obstacles and propose recommendations informed by observations made at the Memphis Muslim Medical Clinic to incorporate culturally competent care into clinical approaches in order to understand and ameliorate these misconceptions and challenges amongst Muslim immigrants and under/uninsured populations. These strategies seek to approach healthcare from a culturally informed approach by incorporating and accommodating health seekers' belief systems into treatment plans in order to maximize their effectiveness and sustainability.

2:10-2:30
Group Panel
Questions and answers.

Urban Studies Senior Seminar: Community Development and Urban Neighborhoods

2:45-2:55 *Impact Investing: Generating Economic and Social Opportunity in Urban Neighborhoods*
James Ekenstedt
Faculty Sponsor: Elizabeth Thomas, Urban Studies Program
The revitalization and reinvestment in underserved neighborhoods throughout the urban core of America's cities is a multi-faceted effort. Impact investing through community development financial institutions (CDFI's) is one of the most prominently used methods. Impact investments are investments made into companies, organizations, and funds with the intention to generate a measurable and beneficial social impact along with a financial return. This process of investing is commonly referred to as pursuing the "double bottom line"; that is, CDFI's are allocating fiscal resources with the intention of completing double bottom line of instigating economic growth and social growth. This research evaluates the social impact of such efforts through three separate CDFI's in three cities whose investments targeted a specific urban neighborhood. Specifically, this research takes into account factors previously left unattended when collecting the social outcomes of impact investing. The research also includes a case study of a Memphis based CDFI, River City Capital, and investigates the specific processes they have in place to measure social and economic growth in order to place this research into a greater context.

2:55-3:05 *The Socioeconomic Impact of Discovery Green on Downtown Houston, Texas*
Jack Griffin
Faculty Sponsor: Elizabeth Thomas, Urban Studies Program
Modeled after the Project for Public Space's (PPS) ideal place-making initiative, Discovery Green, located in Downtown Houston, Texas, has recently been credited with stimulating local economic redevelopment. This paper explores the socioeconomic impact of Discovery Green on Downtown Houston and if this citizen-centric, "green" approach is responsible for catalyzing redevelopment in the surrounding area. Successful place-making initiatives foster sentiments of community and identity – two indicators of social change – by providing citizen stakeholders with a meaningful public asset and by encouraging place attachment. Moreover, the perceived quality or image of a place is extremely instrumental in attracting and retaining businesses, industries and a creative, knowledge-based workforce (Wright and Mainella, 2007), which are essential for economic growth. Therefore, place-making efforts that improve the quality and image of a place directly influence the economic development of the surrounding area. Using Central Houston's Downtown Houston Development Maps to compare the number of nearby developments as well as Social Explorer to compare changes in real estate values before and after the park's completion in 2008, this paper links Discovery Green to the recent boom in redevelopment within Downtown Houston and demonstrates that place-making initiatives have the potential to catalyze socioeconomic change.

3:05-3:15 *Brewing Local Identity: Exploring Local Microbreweries as a Catalyst for Urban Redevelopment*
Lucy Rosenbloom
Faculty Sponsor: Elizabeth Thomas, Urban Studies Program
The urban redevelopment of ailing neighborhoods is a widespread phenomenon occurring in cities throughout the United States. While the construction of arts districts, revitalization of public spaces, neighborhood initiatives, and gentrification are all examples of urban development; they are not the only catalysts. The American microbrewery movement has been on the rise since the early 2000s. Wes Flack's definition of neolocalism is the idea that people are increasingly attempting to reconnect with the local, personal, and unique in order to establish a sense of pride in a community. By providing a local establishment through which place attachment can be grown, microbreweries are

able to promote a feeling of community within a neighborhood by promoting a sense of common local pride. Using interviews with local stakeholders, this paper seeks to explain the impact that local microbreweries have on the urban redevelopment of neighborhoods in Memphis. Initial findings suggest that the introduction of microbreweries to urban areas has a positive social, cultural, and economic impact on the surrounding neighborhoods.

3:15-3:25 *Multi-Dimensional Urban Development Schemes: The Challenging Task of Remediating Blight While Minimizing Residential Displacement*
Andrew Tait
Faculty Sponsor: Elizabeth Thomas, Urban Studies Program
Blight in urban America has often been cited as a major concern for residents, politicians, and academics alike. Unfortunately, gentrification in which higher income residents move in and displace the indigenous residents has become the contemporary fallback process for remediating urban blight. However, four strategies—the gentrification with justice model, asset based community development, urban renewal, and adaptive reuse of industrial brownfields—can remediate and reimagine urban blight, especially when working in tandem with one another. This paper seeks to explain these alternative strategies as well as provide precedent examples from projects around the United States. This paper will then apply these examples in practice to the Water Tower Landing, an emerging community in Memphis, Tennessee. Taking its name from the area's vertical landmark, "the Landing" has potential to unify several smaller neighborhoods around an underdeveloped commercial corridor. With the right stakeholders in development, government, and community leadership applying the four strategies for blight remediation, in 10 to 20 years the Water Tower Landing could provide national precedent for reimagining a blighted neighborhood without displacing the existing residents.

3:25-3:45
Group Panel
Questions and answers.

Urban Studies Senior Seminar: Activism, Arts, and Education in the City

Kennedy 208

4:00-4:10 *Race to the Top: The Varying Impact of Federal Education Policy on Cities*
Sam Brobeck
Faculty Sponsor: Elizabeth Thomas, Urban Studies Program
Race to the Top is an intergovernmental grant program instituted in conjunction with the American Recovery and Reinvestment Act of 2009 to reform some of the "perceived failings of the 2001 No Child Left Behind legislation" (McGuinn, 2012, 136). This program allowed for every state to apply for federal funds for education if certain requirements were met. Doing so allowed for the federal government to rely on incentives instead of sanctions to drive state reform (McGuinn, 2012). With Race to the Top being a federal policy, most of the current research has highlighted the interaction between the national government and the states. This unfortunately leaves out the impact that this legislation and other federal education policies have on cities and local education agencies. This paper tries to rectify this problem by using three case studies to examine the impact of Race to the Top on three comparable cities in states who received similarly sized grants: Memphis, Tennessee, Cleveland, Ohio, and Charlotte, North Carolina. These case studies highlight the many similarities and differences in outcomes found in different urban areas as result of the adoption and implementation of federal education policy.

4:10-4:20 *Common Ground through Sound: How the Levitt Shell Fosters Community through the Arts*
Abbey Judd
Faculty Sponsor: Elizabeth Thomas, Urban Studies Program
The Levitt Shell is a public venue for music, providing over 50 free concerts a year in Midtown Memphis' Overton Park. The performances act as a community ritual and model for art accessibility within the city. As a public place, the Levitt Shell provides a site for individuals to enjoy free music and congregate with other citizens. The Levitt Shell seeks to create a common ground for a diverse audience and facilitate a sense of community through the arts, specifically through professional quality, live music. In an age where arts and arts organizations are seeking more measurable data for their specific impact, many organizations turn to economic development as a means of evaluation. However, arts organizations like the Levitt Shell's contributions to the community could be vastly under estimated and oversimplified by measuring economic development alone. This paper attempts to deconstruct the

social relationships and impacts that occur within public art performances at the Levitt Shell. Specifically, through evaluating the dimensions of diversity and community building practices found within the programming, attendance, and local investment, this paper unpacks various methods of evaluating the organizations' successes and limitations in developing a sense of community in Memphis through music.

4:20-4:30 *Black/Brown Alliance: Police accountability, review boards, and collaboration across communities*
Iris Mercado
Faculty Sponsor: Elizabeth Thomas, Urban Studies Program
Black-Brown Alliance: the political buzzwords that have received attention in the United States across various social justice movements. This calls for the intentionality in creating coalitions between Latino/Hispanic and African-American/black communities though open dialogue and intersection of social issues. Memphis community members involved in social justice activism are getting closer to addressing the intersections in criminal justice reforms across the nation and at a local level. The systemic criminalization and dehumanization of black and brown lives is but one of the ways in which local groups gather around criminal justice reform. The interactions with local law enforcement create a unifying experience and the push for the local restructure and more powerful Civilian Law Enforcement Review Board (C.L.E.R.B.). This civilian oversight of local law enforcement was established in 1994 after the controversial police-shooting of Jesse Bogand, 68-year old resident of Orange Mound. Thus, this research intends to engage 20 local activists, through semi-structured interviews, to discuss their experiences both in organizing for positive, criminal justice reform and broader social justice from the perspective of their own black and brown communities. Additionally, the research discusses the potential for organizing across racial lines as we move forward to address social issues.

4:30-4:40 *The Impact of Transportation on Youth Access and Participation in After-school Program Opportunities*
Dy'Nelle Todman
Faculty Sponsor: Elizabeth Thomas, Urban Studies Program
After-school programs provide essential services to urban youth and communities, and interest in programming, participation and access has increased over the past several years. Growing interest has focused on the ability of after-school programs to (1) work in conjunction with educational efforts driven by goals to increase educational opportunities, ameliorate educational inequities, and bolster student achievement, and (2) combat youth behaviors that are symptoms of larger societal issues. Given the educational and social impact of after-school programs, only 18% of kindergarteners through 12th graders in the U.S. participate in after-school programs. Additionally, 41% of youth not engaged in after-school programs would participate if one was accessible to them (Afterschool Alliance, 2014). The question being asked now is, how can we increase access to and participation in after-school programs? Transportation is an issue plaguing after-school programs across the nation that would improve access and increase participation. This paper aims to extend national conversations about after-school programs by examining the issue of transportation and applying it to local context in Memphis, (1) highlighting this issue for individuals developing after-school initiatives, and (2) providing a foundation for future efforts geared towards a solution taking into consideration school district transportation services and city-wide supports.

4:40-5:00
Group Panel
Questions and answers.

McCOY THEATRE SESSIONS
(Theatre)

2:00-2:30 *Point of View* ◙
Francesqa Santos, Erica Hadley, Celia Mason
Faculty Sponsor: David Mason, Department of Theatre
Point of View is an installation piece that features photographs from a 6-day trip to Trinidad, in which students and faculty studied the ways in which the Hindu community of Trinidad-Tobago celebrates its own counterpart of an important Hindu festival, Holi. The Hindu Prachar Kendra, an institution at the center of Trindad-Tobago's Hindu population, invited the Rhodes group to come and partake in their Phagwa festival. The Hindu population has existed in Trinidad for over 175 years and a look at their customs and community provide an insight to the fluidity and transient nature of their festival. Songs from the Prachar Kendra's Phagwa performance will be featured to give

life to the theatrical elements in Hindu festival. The installation provides a tactile experience of a festival that combines theatrical elements with community events, giving way to an incredible cultural experience. While the installation itself is located in the Frazier Jelke lobby, this event is for the student presentation and small reception.

4:00 *Rhodes/Central High School Theatre Collaboration*
Madeline Carwile Francesqa Santos, Olivia Gacka, Alexandra Greenway
Faculty Sponsor: David Mason, Department of Theatre
Collaborative performance piece in the McCoy Studio.

PALMER SESSIONS
(Commerce & Business, English, Greek & Roman Studies, History, Philosophy, Psychology, Religious Studies, and Spanish)

Time, Text, and Culture I
Palmer 207

1:30-1:45 *Being Lost*
Genevieve Bettendorf
Faculty Sponsor: Scott Newstok, Department of English
As a canonical text, Paradise Lost represents more than just a high point of Early Modern epic verse: we feel its influence throughout the centuries of words that follow its publication; we refer to it not (only) as a religious artifact but as a text demonstrating the poet's rhetorical gifts and supreme facility for language; and, long after we've closed its cover and started on our own "solitary way[s]," (12.649) we find ourselves returning to it for guidance and hope. My paper focuses on John Milton's epic Paradise Lost as a formative text for my liberal studies. Presented originally at a conference dedicated to the examination of core texts and courses, "Being Lost" explores Milton's epic in the light of the canonic tradition. Paradise Lost forced me to complicate my own sophomoric views on study and inquiry in general and this complex process of stepping out of my untried convictions towards an embrace of a closer and more chaotic view of both words and humanity allowed (and still allows) me to participate in and contribute to something larger than myself: a community of lifelong learners both within and beyond our college walls.

1:45-2:00 *Self-Authorization: Marlowe Does "Dido"*
Jordan Evans
Faculty Sponsor: Scott Newstok, Department of English
From whence derives creative authority, or auctoritas? Christopher Marlowe's Dido, Queen of Carthage (c. 1590) grapples with long-established classical texts and characters to craft a drama that both derives from and exceeds its Vergilian precedent. I will first work through the genealogy of the concept of "authority," establishing what it meant for an early modern English playwright to be considered an auctor. I then will examine the relationship between Marlowe and Virgil's versions of the Dido myth (while attending to intermediary "auctors" between the two, including Ovid and Chaucer). Finally, I will examine the play itself, where key passages exemplify how Marlowe's assertion of creative authority differs from that of his contemporaries.

2:00-2:15 *Boiling Frogs: Tennessee's Amendment One through the lens of The Handmaid's Tale*
Victoria Norris
Faculty Sponsor: Anne Reef, Department of English
In November of 2014, Tennessee passed Amendment One into the state Constitution. This was particularly controversial, as it now allows the legislature to make changes to the Constitution in regards to abortion. Some citizens objected to this new law because cases of incest, rape, medical emergency, and personal reasons are no longer means for terminating a pregnancy. In addition, the wording of the law was cryptic and confusing, making it difficult for voters to understand what they were voting for. In 1986, Margaret Atwood published The Handmaid's Tale, a futuristic Christian dystopian novel in which women have no reproductive rights. This paper argues that through the lens of Atwood's novel, Amendment One takes on a more sinister meaning, and offers a different perspective by which to view this new law. This study uses a close reading of The Handmaid's Tale as well as research on laws like Amendment One to explore the ethical and political consequences of such laws. This interdisciplinary paper is important because it offers an unexplored perspective on a rule that limits the rights of half the state's population. It may be of interest to those interested in law and political science, as well as those who

study literature, history, psychology, gender and sexuality studies, religious studies, women's studies, biomedical ethics, and others.

Time, Text, and Culture II
Palmer 207

2:30-2:45 *Dandling Ganymede: Gender and Loyalty in Marlowe's 'Dido, Queen of Carthage'*
Madeline Polinski
Faculty Sponsor: Scott Newstok, Department of English
Christopher Marlowe's romantic tragedy Dido, Queen of Carthage begins in audacious Marlovian style, with Jupiter "dandling" his boy-paramour Ganymede on his lap. Marlowe invented this bizarre scene in his revision of the Virgilian romance and its inclusion has baffled critics and audience alike. With a reputation for scandal, Marlowe was accused in and after his lifetime of atheism, blasphemy, and homosexuality. Some scholars consider this scene a nod to his own lifestyle. Others consider it an attempt at lampooning the use of boy actors in theatre, or as a veiled representation of Elizabeth I's sexual dalliances and reign. Though the Ganymede scene first seems shamelessly and provocatively homosexual, it establishes the dynamics of all the gender relationships found throughout the play. The Ganymede scene sets up an important motif: the elevation of male-male loyalty and bonding over that between a female and a male, a motif that structures key scenes in Dido as well as Marlowe's other work.

2:45-3:00 *Gladiators in Roman Society*
Alexis Jackson
Faculty Sponsor: David Sick, Department of Greek & Roman Studies
One of the most notable facets of ancient Roman society is the gladiator and the spectacles of sport displayed throughout much of Roman history. Today, these fighters are glorified. Gladiators are idolized as heroes, figures of revolution, and as men caught in the tragedy of their circumstance. Is this idea how gladiators were seen in Roman society? Like many other groups in Roman society, these men were marginalized to a lower class of people who not worthy of respect and they did not having many of the same rights as others living in Rome. However, gladiators had the ability to rise to a great level of fame and notability from fighting in the arena, while also serving as a symbol for Roman ideals. In this research, primary evidence will be used to detail the depictions of gladiators in the Roman society. From this evidence it will be shown that gladiators were valued for what they provided for the Roman people, though they were not respected as individual people.

3:00-3:15 *Senecan Epigrams and the Genre of Latin Exile Poetry*
Amelia Stout
Faculty Sponsor: David Sick, Department of Greek & Roman Studies
In discourses on Roman exile, a few names rise to the top, with Ovid and Seneca the Younger receiving considerable attention. Ovid's poetic works from exile, the Tristia and the Epistulae ex Ponto, have been used as the basis of an argument for the existence of a literary genre of exile poetry. His exilic poems, far from simply manifesting his situation and emotions, were part of a complex literary tradition that grew over time. Ovid was aware of previous conventions of exilic writings, and he molded those concepts into a genre of exile poetry with set tropes and guidelines to be followed by later exiles. Although Ovid is the main example of the genre of exile poetry, and his works have been studied in detail, there are not many exiled poets whose works survive after Ovid. Consequently, studies of exile poetry often begin and end with Ovid, picking up centuries later in the tradition, if ever. Seneca was exiled on the island of Corsica by the emperor Claudius several decades after Ovid was sent to Tomis. While Seneca was exiled, he wrote two philosophical consolations, several plays, and, some scholars argue, a collection of assorted epigrams. By examining these Senecan epigrams in light of the concept of a literary genre of exile poetry, it will be possible to explore the extent of Seneca's adherence and contribution to the genre.

Race and Racism
Palmer 207

3:30-3:45 *Unhinging the Racial Contract: An Explicit Analysis of the Different Modes of Oppression that Allow for Subjugation Based on the Hierarchy of Race*
Abigail Hicks
Faculty Sponsor: Rebecca Tuvel, Department of Philosophy
In this paper, I argue that Charles Mills's formulation of the racial contract explains how the valuation of a so-called higher and a so-called lower are created in society because of race. The racial contract subverts the original intention of the egalitarian social contract. Furthermore, using Iris Marion Young's formulation of oppression, I elucidate how the hierarchy of race supported by the racial contract is upheld. I argue in the paper that as the racial contract thrives on a delusional epistemology, an explicit analysis and acknowledgment of these means of oppression is necessary to manipulate, undermine, and eliminate forms of ignorance and privilege and remove the value assigned to race by the racial contract. This is necessary to dismantle the different structures of oppression that uphold the racial contract.

3:45-4:00 *A Report on the Banality of Racism*
Sam Mattson
Faculty Sponsor: Pat Shade, Department of Philosophy
The Title of my Thesis is "A Report on the Banality of Racism." In it I argue that the current state of racism in the United States of America is best described by what I, adapting Hannah Arendt's concept, will call the Banality of Racism. Arendt's work Eichmann in Jerusalem plays an important role in the philosophical development of Banality, but I also rely heavily on the work of sociologists and historians to make my case. I define the Banality of Racism as a combination of structuralized racism and the acceptance of dominant and mainstream white masculine culture, that includes a belief in narratives like the criminality of blackness and the post-racial attitude, which clouds racism and racial inequality and therefore makes it extremely difficult for people to determine what is and what is not racism. This leaves people unable to understand the oppression, challenges, and problems that African Americans and the 'others' in America face on a daily basis.

4:00-4:15 *"Reverse Racism": A White Man's Illusion*
Andrea Tedesco
Faculty Sponsor: Rebecca Tuvel, Department of Philosophy
This paper is an exploration of the contemporary concept referred to as 'reverse racist racism'. The phrase is used to refer to prejudicial actions done against Caucasian folks. My project's aim is to discern whether or not these acts can properly be referred to or defined as racist actions. I first define racism as a form of oppression—more specifically a form of structural oppression. I argue that due to our society's tendency to look at actions in an individualistic way, people are able to falsely conclude that a white person can indeed incur racism. However, when taking a broad societal view of racism and the way it functions, one can see that white people cannot suffer it in the same way as people of color—or suffer it at all. I posit that the idea and usage of the phrase 'reverse racist racism' is a manifestation of white privilege due to privilege's inherently invisible nature.

Acting and Performance
Palmer 208

1:30-2:00 *Rhodes-CHS Collaborative Theatre Program* ◙
Madeline Carwile Francesqa Santos, Olivia Gacka, Alexandra Greenway
Faculty Sponsor: David Mason, Department of Theatre
The Department of Theatre has launched a new fellowships program that facilitates a creative collaboration with an early-morning Theatre class at Central High School. The fellowship program brings together four Rhodes students and fifteen Central High School students to develop an original performance piece that will be performed at Rhodes (during URCAS) and at Central High School. The pathway to the performance includes an array of collaborative exercises designed not only to develop performing competencies and expressive creativity among participants, but also to discover and shape our own personal narratives into a coherent, accessible, performable form. As the four Rhodes fellows involved in this new program, we are proposing a complete URCAS panel during which we can describe the program and the process we have undertaken. The panel will also serve as a venue in which we can

articulate what we have learned about teaching and theatrical creativity, and about the potential of "narrative theatre" to give voice to individuals' private worlds.

Past to Present I
Palmer 210

1:30-1:45 *Qaddafi and The Green Book: Manifestations of Authoritarian Ideology*
Clayton Christian
Faculty Sponsor: Etty Terem, Department of History
While in the west many people have attributed the decisions and rhetoric of notorious Libyan leader Muammar al-Qaddafi to insanity, this paper seeks to look beyond that veil. Using The Green Book Qaddafi's political primer this paper will seek to explore and explain the influences behind his ideology and reveal the implications of these influences.

1:45-2:00 *Hidden Agendas in a Still-Divided Union: Bias in Northern and Southern Newspaper Coverage of the Memphis Riot of 1866*
Katie Jakovich
Faculty Sponsor: Dee Garceau, Department of History
This paper explores bias in Northern and Southern newspaper coverage of the 1866 Memphis Riots. On May 1, 1866, a riot broke out in Memphis, Tennessee. White Southern residents targeted black soldiers and Irish immigrants. Fear permeated the city and violence spread with it, with black neighborhoods targeted for looting and burning. For two days, Memphis was in complete chaos, as the racial tensions that had been barely suppressed since the end of the Civil War rose to the surface. However, to newspapers across the country, the riot presented an opportunity to either express the hidden Southern agenda of maintaining the traditional racial hierarchy or the Northern plan to place blame on white Southerners for the violence of the Civil War. No middle ground existed, which revealed the lingering racial tensions in the South and persistent regional divisions between North and South. The United States was one nation again, but the newspaper coverage reveals that North and South were anything but unified.

2:00-2:15 *Robert Montagne and The Berbers: The Persistence of Myth in French Colonial North Africa*
Matthew Moore
Faculty Sponsor: Etty Terem, Department of History
The French colonial empire depended on official ideology and discourse to provide ideological support for its conquests abroad. In this paper, I examine an anthropological work, The Berbers: Their Social and Political Organization by France's most prominent North African scholar, Robert Montagne. In the work, Montagne tries to formulate an enduring and mutually beneficial relationship between France and Morocco's Berber tribes. However, his conception of this relationship is based fundamentally on myths about the Maghreb formulated a century earlier during the French conquest of Algeria.

Past to Present II
Palmer 210

2:30-2:45 *Female Identity: The Study of Turkish Ottoman Women in Lady Mary Montagu's Turkish Letters*
Prianka Bose
Faculty Sponsor: Etty Terem, Department of History
The research paper aims to study Turkish Ottoman Women in Mary Montagu's Letters. Specifically, how those women's lifestyles serve as a reflection of what Lady Montagu perceives was lacking in the female domain of English courts. This essay reveals early feminist ideology that Lady Montagu used in her efforts to effect change in English society, especially among gender roles. These are changes that people today are still hoping to see.

2:45-3:00 *Power through Peace: Understanding the Concerns and Motives in the UN Partition Plan of 1947*
Nathan Powell
Faculty Sponsor: Etty Terem, Department of History
The goal of this research paper is to reveal how the United Nations attempted to create a peaceful two state system in Palestine and what other factors shaped the document. It will focus on the methods that the UN intended to use in

order to achieve a peaceful solution to the problem of partitioning Palestine and how the UN's unique position in international relations played into the plan.

3:00-3:15 *A Bond Creative and Destructive: Albert Memmi and the Colonial Relationship*
Anne Rebbe
Faculty Sponsor: Etty Terem, Department of History
An examination of Albert Memmi's "The Colonizer and the Colonized," this project seeks to analyze the 20th century Tunisian theorist's characterization of the colonial relationship as fundamentally formative and disfiguring for both parties.

Social Systems and Community Narratives

Palmer 210

3:30-3:45 *The Community Narrative Research Project: Organizational Learning and Change Through College-Based Community Research Initiatives*
Adele Malpert
Faculty Sponsor: Elizabeth Thomas, Department of Psychology
This paper explores the role of participatory research and narrative research methods in fostering organizational learning and change in a college setting. Using the Community Narrative Research Project (CNRP) and the Rhodes College Bonner Scholars Program as a case study, this research examines relationships between research methodologies and community practices. I examined student-written narratives, interviews with researchers, and focus groups with research participants to assess the role of the CNRP in promoting learning and change within the Bonner Scholars Program. My analyses focused on understanding the potential of written narratives to promote problem identification within the Bonner Scholars organization and on CNRP researcher and student experiences of narrative and participatory research strategies. I explore strengths and weaknesses of the CNRP, focusing on tensions between methodological theory and practice. Results suggest that narrative and participatory methodologies might serve as a useful model for understanding organizational learning and change in college settings. Implications for future research are discussed.

3:45-4:00 *Christian Identity and Affiliation in the Struggle for Integration at Southwestern University*
Jenna Sullivan
Faculty Sponsor: Steve Haynes, Department of Religious Studies
In the fall of 1964, Southwestern at Memphis, now known as Rhodes College, opened its doors to applicants regardless of race. This decision was a culmination of years of slow consideration and internal debate. Although the institution was dedicated to providing sound Christian education for young people, this education was exclusive in nature. It was not for everyone. The values that Southwestern claimed in daily chapel services and in Bible courses did not translate into swift administrative action in the years leading up to 1964. This paper will explore the tensions between the official Christian doctrine of Southwestern and the political and social realities that rested beneath the college's every decision. Religious faith was used in a variety of ways in the decision to integrate. For some students, faith compelled them to do whatever they could to ensure that integration would come to their beloved school. For other students, faith required them to keep African-Americans on the margins of education in the South. The administration of Southwestern utilized religious and theological language as a political tool in the process of integration.

4:00-4:15 *Application of French and Raven (1959) Bases of Social Power between Student and Professor in an Educational Environment*
Emily Catherine, Rizer John, Lewis Braxton, Carr Braxton
Faculty Sponsor: Dee Birnbaum, Department of Commerce & Business
The purpose of our study was to apply French and Raven's five types of power in superior-subordinate relationships to the student-professor relationship at Rhodes College. We compiled a survey in order to collect data from the Rhodes Community on students' perceptions of their favorite professor's and their least favorite professor's power in the relationship. Our data partially supported our hypothesis that a student's favorite professors will be perceived as having more reward, legitimate, expert, and referent power while a student's least favorite professor will be perceived as having more coercive power.

Spanish Senior Seminar I
Palmer, Language Learning Center

1:30-1:45 *Borges' Fine Line Between the Fantastic and Magic Realism*
Mary Catherine Cadden
Faculty Sponsor: Kathleen Doyle, Department of Modern Languages
The short stories of Jorge Luis Borges evoke a sense of mystery, wonder, and doubt generating large interest in his works and making him one of the most famous, and most debated, Latin American authors in the world. Recently, much of this consideration has centered on the literary genre to which his works pertain, with arguments ranging from fantasy to marvelous realism as likely categories. However, through careful analysis of the discourse, themes, and tones of some of his more popular stories such as "El Sur," "La biblioteca de Babel," and "Las ruinas circulares," this paper seeks to place his works into two main literary camps, the fantastic and magic realism. By focusing closely on the details of the stories, my paper will show how the two genres coexist together in Borges' Ficciones, often seamlessly blending both genres in a single story, creating a unique reading experience.

1:45-2:00 *Lo femenino y lo fantástico en dos cuentos de Emilia Pardo Bazán*
Lucy Gregor
Faculty Sponsor: Kathleen Doyle, Department of Modern Languages
Spanish author Emilia Pardo Bazán utilized fantastic elements to explore the topics of femininity and sexuality in her short stories. Using cultural and literary analysis influenced by Elaine Showalter's ideas on feminist criticism, this paper explores the ways in which Pardo Bazán used the fantastic to discuss topics otherwise taboo in her society. A literary analysis is necessary to approach and engage with the texts as well as to understand the fantastic, while a study of the cultural and historical importance of Pardo Bazán's works illuminates their importance both in her time and the present day. I argue that specific language use, along with uncanny elements, provided a guise with which Pardo Bazán was able to explore the topic of women and sexuality. By reading her stories through the lens of feminist criticism, her use of multiple, often gendered, discourses as social critique can be understood.

2:00-2:15 *Terror, Trauma, and the Loss of Identity: The Dirty War of Argentina in Heker's El fin de la historia*
Caitlin Jaffe
Faculty Sponsor: Kathleen Doyle, Department of Modern Languages
In Liliana Heker's El fin de la historia, the novelist explores the complexity of the psychological trauma that results from abduction. This trauma is exhibited through the life of Leonora Ordaz, a woman kidnapped from the streets of Buenos Aires, Argentina. Through the use of several narrators, we are able to get a glimpse of what life was like for Ordaz and other victims of kidnapping during the time of the Dirty War. These narrators allow the audience to learn details of Ordaz's unique situation from the multiple points of view of her friends and peers. Through an analysis of Heker's work this essay examines torture and human rights violations enacted by the Argentinian government, as well as the psychological trauma and loss of identity experienced by Ordaz as a surviving victim of the war.

2:15-2:30 *Gendered Paranoia: An Instrument for Social Critique in the Genre of the Fantastic*
Sarah Koehler
Faculty Sponsor: Kathleen Doyle, Department of Modern Languages
In this paper, I will examine gendered representations of paranoia in various fantastic short stories, analyzing both the use of the paranoia as a tool for creating the fantastic, and as a means for commenting on women's repressed role in society. In defining the genre of the fantastic, critics have highlighted the importance of uncertainty and suspense and have noted the genre's facilitation of approaching controversial themes in popular literature. Paranoia is one element of the fantastic that both increases suspense and introduces the possibility of social critique. This paper will explore the representation of feminine and masculine paranoia in "El perseguidor" by Carmen de Burgos and "Las virtudes peligrosas" by Ana María Moix. I will discuss how the characters' paranoia in each story contributes to the story's classification in the fantastic genre. In addition, because paranoia has historically been framed as a primarily feminine ailment, I will also analyze how feminine and masculine paranoia is used in the stories to comment on women and men's roles in society.

Spanish Senior Seminar II
Palmer, Language Learning Center

2:45-3:00 *Marginality and Monstrosity in Rodoreda's work "La salamandra"*
Micah Leonard
Faculty Sponsor: Kathleen Doyle, Department of Modern Languages
The formation of laws are deeply impacted by both constitutional rights and inherent human rights, created to support the morals that a society attempts to uphold. These laws can shape not only our politics, history and society, but can also serve as a mediator of relationships between people and their views of equality. When laws are changed they should serve as a reflection of changing views within that society. This essay seeks to explore Argentinian society and its collective view on the controversial issues surrounding women, particularly regarding the legal changes recently made on femicide, domestic violence and abortion. Through investigation of the rising awareness and support of women's rights, using interviews, literature and law, I seek to explore the ways in which gender roles and patriarchal structures shape both the discussion and approach regarding these topics. *Due to the content of this investigation I would like to give a trigger warning for those who have suffered from sexual assault and gendered violence of any kind. Additionally this content will be presented in Spanish with English translations.

3:00-3:15 *Vigilance, Responsibility, and Hesitation: The Criticial Role of Internal and External Readers*
Rin Palmer
Faculty Sponsor: Kathleen Doyle, Department of Modern Languages
The literary genre of the fantastic is characterized by supernatural elements and events which we must choose whether to believe or not to believe. The reading process requires readers' active participation, as they become part of the story. Exploring the texts of El cuarto de atrás and "Las virtudes peligrosas" through the lens of Todorov's The Fantastic, I will analyze the role of the reader externally reading the texts, as well as the role of the characters who are themselves readers within the texts. I will discuss the reading process, methods of reader response criticism, the various responsibilities of readers, and the presence of silences. This study will explore readers inside and outside of the text, demonstrating how they are not just reading words on a page; they are experiencing a conflict between fiction and reality.

3:15-3:30 *El cuarto de atrás and Conversación al Sur: Identity Through Memory*
Gavi Perl
Faculty Sponsor: Kathleen Doyle, Department of Modern Languages
In the novels, El cuarto de atrás by Carmen Martín Gaite and Conversación al Sur by Marta Traba, the protagonists utilize memory through conversation, dialogue, and interior monologues to recognize the factors that went into the formation of their own identities. Additionally, with this recognition, the narrators/protagonists convey how their identities fit into the national identity of each of their countries in relation to the current or most recent period of repression or dictatorship. In El cuarto de atrás, a mysterious man in black pressures the protagonist, C., to remember formational experiences, in this way allowing her to understand her past and identity following the Spanish Civil War and the Franco dictatorship. In the novel, C. tries to reconcile her memory and experiences with those of Spanish society as a whole. The protagonists of Conversación al Sur, Dolores and Irene, are able to understand their positions in society with regards to the dictatorships in Uruguay and Argentina through the development of their conversation as well as through their own thoughts and interior monologues. Through the simple act of remembering and discussing their countries' past and present, these characters undercut the dominant hegemony that is trying to silence them.

3:30-3:45 *Transformation and Liberation: The Fantastic in "Chac Mool" and "La salamandra"*
Halle Priester
Faculty Sponsor: Kathleen Doyle, Department of Modern Languages
Tzvetan Todorov's work on the fantastic may have used examples from earlier literature, but his theories likewise provide a powerful lens through which to approach more recent texts, such as "Chac Mool" by Mexican author Carlos Fuentes, and "La salamandra" by Spain's Mercè Rodoreda. The physical transformations in these short stories exemplify the themes and narrative techniques of the fantastic genre; for example, the reader experiences a clear hesitation between what is real and what is magical, one of the integral characteristics of the fantastic. However, Carlos Fuentes and Mercè Rodoreda add another twist to their use of fantastic elements, providing

compelling social critiques that draw attention to marginalized populations. Through "Chac Mool" Fuentes highlights the ways in which the indigenous heritage of the Mayan culture has been largely disregarded in modern Mexico, while "La salamandra" conveys Rodoreda's criticism of the repression of women who fail to embody the ideals of patriarchal Spanish society. By writing about metamorphoses that alter the laws of science and nature, these two authors exploit the possibilities of the fantastic to expose the underside of culture.

Spanish Senior Seminar III

Palmer, Language Learning Center

4:00-4:15 *The exploration of Pan's Labyrinth as a cinematic work within the genre of the fantastic*
Elizabeth Short
Faculty Sponsor: Kathleen Doyle, Department of Modern Languages
This paper is an exploration of how and why the film Pan's Labyrinth fits within the literary genre of the fantastic. The classification of the film in this genre is approached from three angles: the perspective of the child protagonist, of the adult characters living in a post civil war Spain under Franco's dictatorship, and of the modern day viewers of the film. By investigating the narrative, historical, and viewer facets of the film in the context of the fantastic, Pan's Labyrinth becomes more than a dark fairy tale used as a metaphor for Spain under Franco, and enters the realm of hesitation and doubt that categorizes the fantastic.

4:15-4:30 *Subversive Depictions of Femininity in Latin American Literature*
Taylor Sieben
Faculty Sponsor: Kathleen Doyle, Department of Modern Languages
This paper explores subversive feminine images in Latin American literature through selected works by Sor Juana Inés de la Cruz, Alfonsina Storni, and Gloria Anzaldúa. These images create a dialogue with the patriarchal culture in which they were produced, but they are also in conversation with each other. Both Sor Juana and Storni subvert gender expectations through contradiction. While patriarchal culture denies female intelligence, for example, Sor Juana constructs a new image of female intellectuality. Similarly, when dominant cultural expectations demand feminine purity, Storni insists that sexual purity is a myth. In the third piece I analyze, however, Anzaldúa does more than simply contradict patriarchal depictions of femininity; she also shows their result by constructing a new image of hardened femininity, adapted to survive the harsh world of patriarchal oppression.

4:30-4:45 *Breaking Gender Roles: A Look into Emilia Pardo Bazán's Works*
Macon Wilson
Faculty Sponsor: Kathleen Doyle, Department of Modern Languages
Emilia Pardo Bazán is known for her influential writings that demonstrate different social and cultural perspectives. For example, in her stories, "Piña" and "Las medias rojas" she tells a story while unveiling a feminist perspective, which draws attention to the differences between depictions of gender. My study seeks to examine her feminist perspective and how it appears throughout these two pieces, chosen because of their distinct depiction of relationships between males and females. One depicts a romantic relationship and the other the dynamic between family members. This study will also examine the representation of women in Spanish culture during the late 19th century and early 20th century, and how those models and images impacted the importance and necessity of Pardo Bazán's work.

4:45-5:00 *Comprehending the Incomprehensible: An Analysis of Trauma*
Dixy Yong
Faculty Sponsor: Kathleen Doyle, Department of Modern Languages
De sobremesa by José Asunción Silva, Conversación al sur by Marta Traba, and El cuarto de atrás by Carmen Martín Gaite are novels that record, narrate, and visualize personal and cultural crisis. There is a spectrum of traumatic events and atrocities that raise questions at individual, national, and international levels. Examining these works can help to approach the complicated process of understanding crisis and the aftermath of trauma. By analyzing distinctive experiences of crisis in these novels, I plan to seek methods to comprehend the incomprehensible.

POSTER SESSION I

Multisports forum of the Bryan Campus Life Center
11:30am – 1:30pm
Poster numbers are listed with each title.

Fellowships

 # 1 *Deaf Family Literacy #1: Bridging the Gap between Research and the Deaf Community in Memphis* ◙
Myrna Sidarous, Annie Moir
Faculty Sponsor: Lori Garner, Department of English
The Deaf Family Literacy fellows explore Deaf culture by interacting with hearing-impaired children and their families, learning ASL, and researching their own interests within Deaf studies. Hilde Haualand's contribution to Open Your Eyes: Deaf Studies Talking, one of the fellowship texts, examines communication barriers between deaf individuals and their hearing family members (2008). Deaf Connect, one of the organizations we work with, addresses such communication problems by offering ASL classes and providing interpretive services. Another community partner, Tennessee Hands and Voices, supports children by teaching their families about educational opportunities. This same principle is demonstrated in Train Go Sorry(Cohen, 1994), which explores children's experiences in a deaf school. Deaf Family Literacy Midsouth helps deaf children with their reading skills and provides parents with resources to help their children succeed. The fellows, together with DFL and the Memphis Public Library, organize Read With Me, Sign With Me events, which incorporate both reading and ASL, connecting to our readings on ways ASL broadens the definition of literacy to include visual modes of learning (Kuntz, 2008). This poster presentation shares the fellows' research and experiences with the Deaf community.

 # 2 *Deaf Family Literacy #2: Healthcare Needs for Deaf Individuals* ◙
Annie Moir, Myrna Sidarous, Lori Garner, Deaf Family Literacy Fellowship
Faculty Sponsor: Lori Garner, Department of English
To have trust between physicians and deaf individuals, communication needs must be addressed. Harold Koenig, who studies the relationship between faith and medicine, explains that focusing on the needs of the patient "not only empowers the patient but also enables the patient to more fully place his or her trust in the HP [health professional] and the treatment plan" (Koenig, 2007). Knowing that about "24.6 million Americans have some degree of hearing loss", the importance of care for these individuals cannot be overlooked (Critchfield, 2002). Steinburg, et al. (2006) conducted interviews with deaf patients and found that many had negative experiences due to their physicians' inability to communicate with them, which led to mistrust. Communication between physicians and deaf individuals can be improved by incorporating deaf cultural education into medical school. Medical students who complete a Deaf Community Training program "significantly increase their capacity to care for community members and reduce health disparities experienced by this [Deaf] community" (Hoang, 2015). This research project focuses on the communication barriers that deaf individuals face in healthcare settings and how hospitals can aid in the process by educating the staff on cultural awareness, as well as providing interpretive services.

 # 3 *Deaf Family Literacy #3: Early Childhood and Deaf Education* ◙
Brynna Newkirk
Faculty Sponsor: Lori Garner, Department of English
Early childhood Deaf education practices are a high point of controversy among hearing as well as d/Deaf teachers, administrators, and parents. Policies for young d/Deaf children in America, such as IDEA (Individuals with Disabilities Act) and the Title 34 of the Code of Federal Regulations, tend to be helpful in regards to accommodations but less helpful on in-class efforts (Hult et. al. 2015). However, studies have found that when given a set of recommended practices from researchers in the areas of independent reading and problem solving, veteran teachers are often willing to adopt a different method of teaching when given sound evidence based-practices. On the flip side, new teachers often adapt to the climate of the school environment (Easterbrooks et. al. 2015). Various practices, such as using true problems in mathematics (Easterbooks et. al. 2015) or using an expanded core curriculum (Johnson 1997), are used in the United States in early childhood education. How does socioeconomic status affect a student's ability to access quality d/Deaf education? Many d/Deaf students require an extensive amount of extra services that are costly (Luckner et. al 2012). What other practices besides expensive technology can be used to level this gap?

 # 4 *Deaf Family Literacy #4: Talking Back Through Deaf Drama* ◙
Brittney Threatt
Faculty Sponsor: Lori Garner, Department of English
In 1967 the National Theatre for the Deaf, the first deaf theatre, was founded. Actors in the NTD were from deaf social clubs where "theatre was presented for deaf people by deaf actors and deaf directors" (Padden 2005). These actors brought that same spirit of Deaf pride and responsibility from the Deaf community to the first deaf theatre, a spirit also present in later theatres. In fact, "some of the groups will not include a spoken text under any circumstances. They feel that if the hearing want to have access, they will have to learn sign language" (Cohen 1989). This push of one language onto another culture is explored in Mark Medoff's play Children of a Lesser God (1986). Not all theatres employed this method of presentation. Other theatres, such as Fairmount Theatre of the Deaf's Circus of Signs (1982), strove to make deaf theatre accessible to hearing people so that they would become educated about deaf people and their true abilities. Presently, the creators of "Switched at Birth" (2011) use the television drama to educate the hearing. Whatever the political motive, Deaf people can utilize deaf drama to define themselves as able and empowered despite their inability to hear.

St. Jude Summer Plus

 # 5 *Pharmacogenetics of methotrexate resistance in pediatric acute lymphoblastic leukemia* ◙
Tyler Harvey, Rhodes College; Elixabet Lopez-Lopez, Steven W. Paugh, Erik J. Bonten, William E. Evans, Department of Pharmaceutical Sciences, St. Jude Children's Research Hospital
Faculty Sponsor: Terry Hill, Department of Biology
Acute lymphoblastic leukemia (ALL), a cancer of white blood cells, is the most common type of cancer in children. Current chemotherapy treatments of pediatric ALL patients have produced 5-year survival rates near 90%. The reasons for the poor prognosis of ~10% of ALL patients remain unknown. However, one of the leading causes of treatment failure appears to be de novo or acquired drug resistance. In this study, we used genome-wide approaches to identify genomic determinants of methotrexate (MTX) resistance, an anticancer drug used in most treatment regimens for newly diagnosed ALL. By altering the expression of candidate resistance genes, significantly above or below typical thresholds, it may help us understand the effects these genes and their protein products have on MTX sensitivity. Genome-wide association studies (GWAS) were used to identify top candidate genes, including BUB1 and BCL11B. Using a CRISPR/Cas9 system, we created constructs to knockout these genes in human ALL cell lines. During this project, these cell lines will be tested for MTX resistance, giving insights into whether these genes influence MTX sensitivity of ALL cells. This research could provide new insights on the contribution of genome variation to MTX resistance and help further personalize MTX treatment of ALL.

 # 6 *The weight of obesity on influenza virus evolution* ◙
Cydney Johnson, Rhodes College; Erik Karlsson, Stacey Shultz-Cherry, Department of Infectious Diseases, St. Jude Children's Research Hospital
Faculty Sponsor: Carolyn Jaslow, Department of Biology
RNA viruses, like influenza, are highly mutable. Previous studies have demonstrated that nutritional status of the host can affect RNA virus mutation by changing host immune or redox status. One nutritional state that could impact viral mutation is obesity through increased inflammation and decreased immune response. Studies in animals and humans show obesity as a major risk factor for development of a severe influenza infection. Therefore, we hypothesized that obesity could lead to mutations in influenza virus. To understand how viruses change between hosts, influenza was passaged through control and obese mice. Virus passaged through obese hosts caused increased morbidity and mortality in lean and obese hosts compared to "lean" control virus. In addition, the "obese" virus showed increased replicative capacity in vitro. Changes in viral populations can also occur in individuals. Therefore, we looked at the effect obesity has on infection duration and severity during a singular influenza virus infection. Obese hosts had positive influenza titers two to four days longer than lean counterparts, a risk factor for viral mutation and potential viral spread. Future studies will focus on full genomic sequencing of "lean" and "obese" viruses to detect viral mutations stemming from replication in the obesigenic environment.

 # 7 *Does Overriding an Interruptive Clinical Decision Support Prescribing Alert Mean the Alert is not Valuable? A Comparison of Override Rates to an Updated Measure of Clinician Alert Adherence.* ◙

Mary Crowell, Mariam Ebeid, Rhodes College; Michael Dejos, Jonathan Burlison, James Hoffman, Department of Pharmaceutical Sciences, St. Jude Children's Research Hospital
Faculty Sponsor: David Kabelik, Department of Biology

Within the medication use process, there are many opportunities for errors, where prescribing errors are common. Two types of prescribing errors that can lead to patient harm are not accounting for drug-drug interactions (DDI) or patient drug allergies. While working in the Calvo McKenna Hospital in Santiago, Chile during the summer of 2014, we manually identified and recorded drug-drug interactions on patient charts. In contrast, St. Jude prescribers use an automated Clinical Decision Support (CDS) prescribing alert system, which detects DDIs and drug allergies. These systems have the potential to prevent patient harm, yet ensuring that all alerts are clinically meaningful is challenging. This project compared a common CDS evaluative metric, override rate, to a developed metric, adherence rate, for a subset of drug allergies. The purposes of this project were to evaluate the validity of these metrics for evaluating CDS systems and to assess prescriber performance. Results indicate differences in the two metrics, suggesting that the revised adherence rate is a more accurate reflection of clinician responses to alerts than override rate. Prescribers were largely adherent to the alerts and the methods used to compute adherence rate can also identify prescribing errors, so that improvement opportunities can be explored.

 # 8 *Possible role of transmission of H9N2 Influenza virus from pet birds to mammals* ◙

Brian Lenny, Rhodes College; Karthik Shanmuganatham, Robert Webster, Jeremy Jones, Department of Infectious Diseases, St. Jude Children's Research Hospital
Faculty Sponsor: Gary Lindquester, Department of Biology

Influenza subtypes occasionally emerge from animals and cause pandemics in humans. Surveillance of this virus in birds and other animals is critical for pre-pandemic planning. Influenza A H9N2 viruses are endemic in poultry throughout Eurasia. They possess proven reassortment potential, and have demonstrated mammalian tropism. For these reasons, the H9N2 subtype remains a significant public health and pandemic risk. While the poultry trade provides well-documented opportunities for spread of H9N2 viruses within countries, pet markets provide additional opportunity for cross-border movement of H9N2 viruses. We examined the ability of a pet market H9N2 influenza isolate to replicate and transmit among pet birds (finches, parakeets and doves). Environmental samples were taken from the cage and water to assess possible transmission routes. To model replication in mammals, we assessed infection ex vivo with tissues from pigs and humans, and we examined virus transmission in vivo with ferrets. We found that H9N2 replicates in pet birds, but does not transmit to naïve cage mates. Some species shed virus into water troughs which could serve as a source of fomite-driven transmission to humans. The H9N2 virus also showed replication in various tissues from mammals. These studies will not only give us insight into the route of transmission of this virus within avian species, but even zoonotic transmission to mammals.

 # 9 *Exploring miR-206 targets and their roles in rhabdomyosarcoma* ◙

Jonathan Go, Rhodes College; Jason A. Hanna, Matthew R. Garcia, Mark E. Hatley, Department of Oncology, St. Jude Children's Research Hospital
Faculty Sponsor: Kimberly Brien, Department of Chemistry

Rhabdomyosarcoma (RMS) is the most common pediatric soft tissue sarcoma and histologically resembles an arrested state of muscle development. Despite many clinical trials, no significant improvement in survival has been made over the past several decades. We study microRNAs (miRNA) as possible novel therapeutic candidates for RMS. MiRNAs are small non-coding RNAs that regulate expression of target genes by either promoting mRNA degradation or repressing translation. MiR-206 is a skeletal muscle specific miRNA that promotes myoblast differentiation and functions as a tumor suppressor in RMS. Preliminary reports suggest that miR-206 replacement could have therapeutic value in RMS; however, the mechanism of action remains elusive. We identified potential miR-206 target genes by transfecting human RMS cells with a miR-206 mimic and analyzing gene expression with mRNA microarrays and determine protein levels with tandem mass tag proteome profiling. We validated putative miR-206 target genes by cloning the 3' UTRs containing the predicted miR-206 sites into a luciferase reporter and tested specificity with mutations of the miR-206 binding sites. These miR-206 target genes are being further assessed with gain-and-loss of function phenotype characterization to determine the role of the targets in RMS and further establish the potential of miR-206 as a therapy.

 # 10 *Multidrug resistant bacteremia among pediatric cancer patients in Mexico City* ◙

Elizabeth Bittner, Rhodes College; Martha Aviles-Robles, Department of Infectious Diseases, Hospital Infantil de México Federico Gómez; Sericea Stallings-Smith, Department of Epidemiology and Cancer Control, Miguela A. Caniza, Department of Infectious Diseases, Rohit P. Ojha, Department of Epidemiology and Cancer Control, St. Jude Children's Research Hospital

Faculty Sponsor: Mauricio Cafiero, Department of Chemistry

Multidrug resistant (MDR) bacteremia is speculated to be an emerging threat to pediatric cancer patients, but little information is available about the burden, particularly in developing countries. We aimed to estimate the Gram-specific prevalence and proportion of MDR bacteremia among pediatric cancer patients with febrile neutropenia. Our eligible population included all episodes of febrile neutropenia admitted to the hematology/oncology unit of Hospital Infantil de México Federico Gómez (Mexico City) between November 2009 and September 2010. MDR bacteremia was defined as microbiologically-documented bacteremia that was non-susceptible to ≥1 agent in ≥3 antibiotic categories. We estimated the Gram-specific prevalence and proportion of MDR bacteremia with corresponding cluster-adjusted 95% confidence limits (CL). Our study population comprised 216 episodes of febrile neutropenia (n=141 patients), of which 23 episodes were microbiologically-documented bacteremia. The prevalence of MDR Gram-positive bacteremia was 0.46% (95% CL: 0.06%, 3.3%), and the proportion was 4.3% (95% CL: 0.55%, 27%). The prevalence of MDR Gram-negative bacteremia was 1.8% (95% CL: 0.69%, 4.8%), and the proportion was 17% (95% CL: 6.2%, 40%). Our findings suggest higher prevalence and proportion of MDR Gram-negative than Gram-positive bacteremia among pediatric cancer patients. Antimicrobial stewardship programs may be indicated to prevent an increase in multidrug resistance.

 # 11 *Validating the use of molecular field similarity to identify novel drug leads* ◙

Rachel Nelson, Rhodes College; Anang Shelat, Department of Chemical Biology and Therapeutics, St. Jude Children's Research Hospital

Faculty Sponsor: Mauricio Cafiero, Department of Chemistry

Two dimensional 'topological' chemical similarity– directly comparing the bonds and atoms between molecules– is a common way of identifying novel compounds that 'look' like target molecules. This structural comparison approach fails to identify molecules with different scaffolds or large changes in substituents. However, it is known that two structurally distinct molecules have similar molecular interaction fields in their bound conformations if they interact with the same target. Molecular interaction field properties– such as van der Waals, electrostatic potential, and hydrophobicity– can be used to compare molecules as an alternative to 2D chemical topology. Here, we report validation experiments using the Forge program from Cresset software. Forge uses the eXtended Electron Distribution (XED) force field to identify molecular interaction field extrema, termed "field points", which are then used to efficiently compare the interaction fields between compounds. We devised one test set of 16 drugs known to hit distinct targets, then quantified how conformational expansion and alignment parameters affect the program's ability to identify bioactive conformers. We devised another test set of structurally distinct drugs to determine the program's ability to identify molecules that hit the same biological target. We found that the program is highly sensitive to conformational expansion.

 # 12 *EZH2 Knockdown in Embryonic Stem Cells Has No Effect on Cell Pluripotency* ◙

Arishna Patel, Rhodes College; Jon Klein, Cat Willis, Jamy Peng, Department of Developmental Neurobiology, St. Jude Children's Research Hospital

Faculty Sponsor: Dhammika Muesse, Department of Chemistry

Stem cells are self-renewing, specialized cells that can differentiate into multiple cell types for development and regeneration by undergoing gene expression changes. Gene expression changes in stem cells are achieved, in part, via chromatin modifications, which include histone methylation, phosphorylation, and acetylation. The Polycomb Repressive Complex 2 (PRC2) is a protein complex associated with chromatin modification and is vital to development. Deregulated expression of PRC2 components has been linked with various cancers such as melanoma and lymphoma. The PRC2 contains an enzymatic subunit, which can be enhancer of zeste homolog 1 or 2 (EZH1 or EZH2). The PRC2 promotes gene silencing by di- and tri-methylating lysine 27 of histone H3. We investigate the role of EZH1 and EZH2 to understand the function of PRC2 in embryonic stem cell (ESC) maintenance and differentiation. By knocking out EZH1 and EZH2 in ESCs and performing reverse transcriptase-quantitative PCR (RT-qPCR) assays, we profiled mRNA expression of multiple pluripotent and differentiation markers. We confirmed multiple ESC clones with EZH2 knockdown and found via RT-qPCR that the cells remained pluripotent since expression of pluripotency markers (OCT4 and NANOG) were similar to control. We are still working to achieve EZH1 knockdown.

 # 13 *Microsomal modeling of two novel compounds against Trypanosoma brucei* ◙

Regan McCormick, Rhodes College; Gloria Holbrook, Angela Carillo, Fangyi Zhu, R. Kiplin Guy, Department of Chemical Biology and Therapeutics, St. Jude Children's Research Hospital

Faculty Sponsor: Larryn Peterson, Department of Chemistry

African trypanosomiasis, also known as sleeping sickness, is a lethal disease endemic to sub-Saharan Africa. It is caused by the gambiense and rhodesiense subspecies of Trypanosoma brucei, a protozoan, and has few treatment options currently available. St Jude has recently developed two compounds, SJ565254 and SJ565672, which show inhibition against T. brucei gambiense at 38 nM and 1 nM, respectively, and 18 nM and 11 nM, respectively, against rhodesiense. Here, both compounds were tested in liver microsome stability and protein binding assays to determine half-life (T1/2) and percentage of compound bound, respectively, in microsomal protein. The microsome stability assay tracked the degradation of the test compound by CYP enzymes and the half-life is determined using LC/MS. Stability was tested in pooled microsomes from mice, rats, dogs, and humans at three compound concentrations: 0.8 µM, 4.0 µM, and 20µM. Half-life for SJ254 was greater than four hours at all concentrations in all species except mouse. SJ672, however, showed less favorable microsomal stability. At low concentration (0.8 µM), T1/2 was less than one hour for all species except rat (T1/2 = 1.4 hr). Next, protein binding was analyzed using an equilibrium dialysis method with the same microsome species and compound concentrations as stability. Greater than 98% of SJ254 was bound to the microsome proteins for all species and concentrations tested. SJ672 exhibited greater than 90% binding for all species and concentrations. Finally solutions obtained from the stability assay will be used to track possible metabolites. Limited animal studies showed that these compounds have potential to move forward in the development process; however, further physiochemical characterization, metabolite identification, and structural modification should be determined to improve the drug-like properties of these compounds.

 # 14 *Evaluation of 6-[^{18}F]fluorodopamine (^{18}F-DA) as an Effective PET Radiotracer For the Diagnosis and Treatment of Neuroblastoma* ◙

Adam Petraglia, Rhodes College; Elizabeth Butch, Scott Snyder, Department of Radiological Sciences, St. Jude Children's Research Hospital

Faculty Sponsor: Ann Viano, Department of Physics

Neuroblastoma is an early childhood cancer with an average age at diagnosis of 18 months. In 70% of cases, neuroblastoma is not detected before disease has spread to multiple sites. Currently, the only effective method to assess tumor response to therapy is the use of both structural and functional imaging with a radioactive drug (radiotracer) injected intravenously into the patient. Neuroblastoma imaging currently relies on *meta*-iodobenzylguanidine ([^{123}I]MIBG) using SPECT-CT as the standard imaging method. However, [^{123}I]MIBG results in poor image resolution, fails to quantify tumor uptake, and remains in the bloodstream long after injection, thus delaying imaging and prompting safety concerns. In response to this issue, using novel chemistry, 6-[^{18}F]fluorodopamine (^{18}F-DA) has been developed as a promising radiotracer due to its high specific activity, shorter half-life, faster clearance, and its usage with advanced positron emission tomography (PET) imaging methods. Evaluating ^{18}F-DA *in vitro* and in animal models is expected to provide improved detection of metastases and allow for the quantification of uptake needed to more adequately treat and diagnose those children with neuroblastoma.

 # 15 *The impact of alcohol consumption on neurocognitive dysfunction and psychological distress in adult survivors of childhood cancer* ◙

Brooke Bierdz, Rhodes College; Tara Brinkman, Department of Epidemiology and Cancer Control, St. Jude Children's Research Hospital

Faculty Sponsor: Kim Gerecke, Department of Psychology

Survivors of pediatric onset cancer are at-risk for neurocognitive problems following exposure to cancer-directed therapies. Heavy alcohol consumption is associated with neurocognitive dysfunction and distress in the general population; however, the contribution of alcohol consumption to these outcomes in survivors of childhood cancer is unknown. Participants included 3,806 adult survivors of childhood cancer (54% female; mean[sd] current age = 27[6] years; time since diagnosis = 25[4] years) who completed measures of alcohol use, neurocognitive function and psychological distress. Multivariable regression models were used with risk ratios (RR) and 95% confidence intervals (CIs) reported. After adjustment for sex and cranial radiation therapy (CRT), younger age at drinking initiation (i.e. <18 years vs. >18 years) was associated with impaired working memory (RR=1.31, 95% CI, 1.09-1.56). Stratification by sex revealed that this association was only significant among females (RR=1.38, 95% CI, 1.11-1.73). Heavy/risky drinking was not significantly associated with neurocognitive impairment beyond the contribution of CRT. Younger age at drinking initiation was associated with increased risk of anxiety (RR=1.58, 95% CI, 1.22-2.03), though chronic alcohol consumption was not. Results suggest a specific contribution of younger

age at drinking initiation, beyond traditional treatment risk-factors, to neurocognitive and psychological outcomes in survivors of childhood cancer.

Natural Sciences

 # 16 *Disparity Implications of Proposed 2015 Medicare Eligibility Criteria for Medication Therapy Management Services*

Caroline Clark, Junling Wang, PhD1, Yanru Qiao, MS1, Christina Spivey, PhD1, Christine Li1, Caroline Clark2, Yuewen Deng3, Jeffrey Tillman1 and Marie Chisholm-Burns, PharmD, MPH, MBA, FCCP, FASHP1, (1)The University of Tennessee College of Pharmacy, Memphis, TN, (2)Rhodes College, Memphis, TN, (3)Northwestern University, Evanston, IL

Faculty Sponsor: Alan Jaslow, Department of Biology

Since implementing the Medicare prescription drug (Part D) program in 2006, the Centers for Medicare & Medicaid Services (CMS) have required Part D plans to offer medication therapy management (MTM) services to individuals who (1) have multiple chronic conditions, (2) use multiple Part D drugs, and (3) have annual drug costs exceeding $4000. The objective of this study was to analyze the racial and ethnic disparity implications of the proposed 2015 criteria for MTM eligibility using the Medical Expenditure Panel Survey (2010-2011). Results suggest that Blacks were 26% less likely to be eligible than Whites and Hispanics were 47% less likely. The newly proposed 2015 criteria seem to be associated with similar racial and ethnic disparities. To promote health equity, decision makers need to implement strategies that are not utilization-based.

 # 17 *Associations of Systolic Blood Pressure Variability with Mortality*

Margit Mikkelsen, Csaba P Kovesdy, Memphis VAMC, University of Tennessee Health Science Center, Memphis TN

Faculty Sponsor: Alan Jaslow, Department of Biology

Background: Blood pressure does not remain constant, but instead is constantly fluctuating. The implications of this variability in blood pressure are not yet fully understood. The purpose of this study is to better understand the effects of increased systolic blood pressure variability (SBPV) on mortality and other clinical outcomes. Methods: From among 3,285,684 US veterans with normal eGFR during 2005-2006, we identified 2,865,157 patients who had more than 7 outpatient blood pressure measurements. SBPV was measured using the standard deviation (SD) of all SBP values in one individual. Associations of SD quartiles (<10.28, 10.28-12.68, 12.69-15.60, ≥15.61) with all-cause mortality was examined using Cox models adjusted for age, gender, race, baseline eGFR, comorbidities, BMI, SBP, DBP, and antihypertensive medication use. Results: Higher SBPV was associated with significantly higher risk of all-cause mortality. In fully adjusted models SD quartiles 2 through 4 (compared to the first quartile) were associated with hazard ratios (95%CI) of 1.14, 1.40, and 1.95. Conclusion: Increased SBPV is associated with increased risk for mortality, independent of confounders. The effect of interventions that lower SBPV on mortality will need to be examined in clinical trials.

 # 18 *Effect of Gender on Aggression in Crayfish*

Zachary Kauffman, Jocelyn Labombarde, Hannah Schadey, Garrett Durbin

Faculty Sponsor: Laura Luque de Johnson, Department of Biology

Previous studies have shown that higher testosterone levels increase aggression in animals, resulting in a higher tendency for them to fight with others. Because of the difference in sex, hormonal levels of testosterone will be of greater concentration in the males rather than in females. Since crayfish are already an aggressive species, we hypothesized that male crayfish will be more aggressive than female crayfish when placed in tanks with their same sex due to the higher level of hormonal testosterone present in male crayfish. This will elicit more agonistic behaviors and bouts between males than will be presented by the female crayfish. By placing two of the same sex crayfish within an aquaria and measuring the time spent fighting between the two males compared to the two females, the relative levels of aggression can be determined. Since testosterone plays a vital role in animal behavior, specifically aggression, males are predicted to spend more time fighting than females when placed in contact with other animals of the same sex. This experiment will give insight into animal behavior based on sex and could also have implications for human behavior, particularly aggressive tendencies of males.

 # 19 *Gender Norms of Aggression in Crayfish* ◙
Hannah Schadey, Jocelyn Labombarde, Zachary Kauffman, Garrett Durbin
Faculty Sponsor: Laura Luque de Johnson, Department of Biology
Previous studies have shown that higher testosterone levels increase aggression in animals, resulting in a higher tendency for them to fight with others. Because of the difference in sex, hormonal levels of testosterone will be of greater concentration in the males rather than in females. Since crayfish are already an aggressive species, we hypothesized that male crayfish will be more aggressive than female crayfish when placed in tanks with their same sex due to the higher level of hormonal testosterone present in male crayfish. This will elicit more agonistic behaviors and bouts between males than will be presented by the female crayfish. By placing two of the same sex crayfish within an aquaria and measuring the time spent fighting between the two males compared to the two females, the relative levels of aggression can be determined. Since testosterone plays a vital role in animal behavior, specifically aggression, males are predicted to spend more time fighting than females when placed in contact with other animals of the same sex. This experiment will give insight into animal behavior based on sex and could also have implications for human behavior, particularly aggressive tendencies in males.

 # 20 *Keep Off Of The Grass: The Effects of Habitat Development on Avian Species Richness on two Shelby County Golf Courses*
Conner Bradley,Thomas Beamish, Robert Bohrer, Andres Miller
Faculty Sponsor: Thilina Surasinghe, Department of Biology
Urbanization and suburban development are responsible for the loss of wetland, riparian, and grassland habitats. These resources are critical sites for a wide range of migratory and residential bird species, and habitat fragmentation and disturbances contribute heavily to local population decline. Therefore, presence of large habitat patches such as old-growth wood lots and recreational natural areas may contribute to preserving biodiversity at local and landscape scale. Further, avian research suggests that mosaic habitats with multiple biological resources and ecotones (wetlands, streams, grasslands, woodlands, scrublands) supports residential and migratory avifauna by providing multiple resources needed for their survival and reproduction. By comparing two similar habitat mosaics in Shelby County, T.O Fuller State Park (protected area in a rural landscape) and Overton Park (a conservancy property in an urban landscape), we plan to investigate the effects of urbanization on avian species richness. Sampling will be done using stationary point counts and direct observation of bird species within a 100-yard radius. The results of the project, used in conjunction with data collected from the eBird database, can be used to track the efficacy of habitat restoration and conservation efforts in Shelby County.

 # 21 *Distribution and Abundance of Invasive Species in Overton Park's Old-growth Forest*
Tyler Cummings, Quynh Jacobs, Ryan Niedermair, Elizabeth Walker
Faculty Sponsor: Thilina Surasinghe, Department of Biology
Each year various species are introduced via direct or indirect human interventions into habitats outside of their native range. Such exotic species do not have natural competitors or natural predators and often exploit disturbances. This allows them to thrive at the expense of native species by limiting resource availability and competitive exclusion, introducing disease, and altering vital ecosystem processes. First step in management of invasive species is to document their presence and then to monitor their prevalence so that migratory actions can be taken on the species that are mostly problematic. To support such conservation-driven actions, we plan to assess the abundance and distribution of invasive plant species in Overton Park Old-growth Forest in Memphis, TN. We will assess 0.043 Km2 in plots, focusing on four focal species: English ivy, Japanese honeysuckle, Kudzu, and Monkey Grass using the cluster sampling method. Based on our preliminary observations, we expect English Ivy and Japanese honeysuckle to be the most prevalent, and that there will be a higher abundance of invasive species along the roads and trails than in the forest core.

 # 22 *Assessment of Riparian Buffer Zones in the Southwest Region of Tennessee*
Chandler Kuhlman, Cari Harris, Kim Xiong, Amelia Phelps
Faculty Sponsor: Thilina Surasinghe, Department of Biology
Riparian areas are upland environments adjoining the wet channel of aquatic habitats. Riparian zones provide a host of benefits for aquatic and terrestrial habitats at both local and landscape scales. They act as a buffer zone for non-point source pollution (eroded soil, agricultural and urban runoff), mitigate floods, improve water quality, and provide resources for many semiaquatic species. Riparian areas are facing many threats such as agriculture, pollution, and urbanization. As a result, riparian areas have become a focal point of conservation. Our aim is to evaluate current extent of protection provided to the riparian areas of southwestern Tennessee (Shelby, Tipton, and

Fayette counties), an area with severely-imperiled surface water. We will use GIS (ArcGIS 10) software for this analysis. . Our basic inferences form remotely-sensed data suggest that riparian zones of Tipton and Fayette counties are primarily agricultural. Riparian areas of Shelby County are mostly urbanized with little conservation afforded. Our research will identify the conservation gaps in the riparian corridors of the Mississippi River Alluvial and Loess plains. Our research will support efforts of land trust conservancies, local (TWRA, TDEC) and federal (EPA, FWS, NPS) governmental agencies to identify and prioritize critical areas for conservation and management.

 # 23 *Effects of Urbanization on the Richness and Diversity of Amphibian Species*
Taylor Weidow, Summer Preg, Radhika Puri, Kristal Skrmetta, Arthur Willis
Faculty Sponsor: Thilina Surasinghe, Department of Biology
We intend to assess the impacts of urbanization on pond-breeding amphibians in Mississippi Valley Alluvial floodplains and Loess plains ecoregion of the Mid-South. Wetlands are critical breeding and foraging habitats for amphibians; pollution and habitat alteration in these wetland areas can have detrimental impacts to inhabitants. We hypothesized that urbanization might negatively impact water quality and habitat structure of wetlands and thereby reduce amphibian occupancy. We will compare amphibian species richness and environmental variables of a wetland in a suburban landscape to a forested area through call-count surveys. The suburban wetland is being surveyed for the first time. Therefore, our research will add valuable information to the FrogWatch citizen-science database that can be subsequently used for biodiversity monitoring and long-term conservation research. So far, we have recorded the presence of six species in the suburban site: Spring Peeper, Green Frog, Pickerel Frog, Southern Leopard Frog, Bird-voiced Treefrog, and American Toad. Our study will help understand the ecological impacts of urbanization and land development on wetland ecosystems; this will lay a basic foundation for science-based conservation and management of wetland environments. Furthermore, our survey will underscore the importance of wetlands embedded in human-inhabited landscapes as habitats for native amphibians.

 # 24 *Boronic Acid Derivatives of Suberoylanilide Hydroxamic Acid as Potential Anti-Cancer Agents*
Emily Berenson, Madhuri Prasad
Faculty Sponsor: Kimberly Brien, Department of Chemistry
Suberoylanilide hydroxamic acid (SAHA), otherwise known as vorinostat, is a histone deacetylase inhibitor (HDI) that is approved by the U.S. Food and Drug Administration to treat cutaneous T-cell lymphoma (CTCL). Although it is orally active in low concentrations, vorinostat displays low selectivity in targeting cancer cells and has a short half-life. Based on recent research supporting the effectiveness of boronic acid compounds for use in drug therapy, the goal of our research is to synthesize the first boronic acid analogues of SAHA. Specifically, the new analogues will replace the hydroxamic acid functional group with an aminoboronic acid, a hydrazine boronic acid, a hydroxylamino boronic acid and a thiol boronic acid. These boronic acid suberoylanilides may more selectively bind the zinc cofactor of histone deacetylase (HDAC) and increase the effectiveness of the drug.

 # 25 *Synthesis of unnatural amino acids and their introduction into the structure of peptides with potential antibiotic activity*
Luke Embury, Aashray Singareddy
Faculty Sponsor: Kimberly Brien, Department of Chemistry
As a result of a decrease in effectiveness of conventional drugs, pathogenic resistance to antibiotics has been increasing rapidly. This makes sources of new antibiotics, such as those from nature, indispensable. Venoms are complex mixtures of active compounds. They contain many active components and some have been documented to have antibacterial properties. Scorpion venom contains some products with antibacterial activity; unfortunately, they are also toxic. We will focus on 4 short peptides found in scorpion venom that depend on alpha helical secondary structure to generate its biological properties. By changing the hydrophobic or hydrophilic regions of the alpha helix, we can change its amphilicity. Our goal is to change their primary structure to potentially reduce the peptides' toxicity. We aim to modify the helix through incorporation of unnatural amino acids. Furthermore, depending on the amino acids used, incorporation of the amino acids could not only decrease toxicity, as mentioned, but also potentially increase stability against natural peptidases. Initially, our plan is to synthesize several side chains including, for instance, boron or azulene amino acid derivatives and incorporate these unnatural amino acids to the peptide sequences. Once synthesized, we will test the activity and toxicity of the synthetic peptides.

 # 26 *Design of Amino Acids for the Synthesis of Unnatural Peptides with Antibiotic Activity*
Quentin Buck, A.F. Petraglia
Faculty Sponsor: Roberto de la Salud Bea, Department of Chemistry
In previous work our group has demonstrated that modifications on well-defined points in the sequence of peptides with antibiotic activity, found in scorpion venom, can retain or in some cases increase the antibiotic activity by reducing significantly their inherent toxicity. These modifications have been done by substituting the original amino acids with other natural ones. Despite the satisfactory results, the introduction of other natural amino acids creates peptides that are prone to degradation by peptidases. In addition, by using natural amino acids we have a limited number of side chains we can use for peptide modifications. Currently we are working on the synthesis of a library of unnatural amino acids containing unusual or unknown structures and elements "orthogonal" to living organisms. This amino acid library has been designed to introduce specific properties, such as hydrophobicity and hydrophilicity, high antibiotic activity, low toxicity, and resistance to potential natural degradation. In our presentation we will introduce some of these desired amino acids, their synthetic scheme and the general idea of their use in the synthesis of antibiotic peptides.

 # 27 *Environmental Assay of McKellar Lake* ◙
Aaron Banks, Andrew Tutor Additional Faculty Sponsor: Dr. Terry Hill
Faculty Sponsor: Jon Russ, Department of Chemistry
McKellar Lake sits just south of President's Island, a major industrial park in the Mississippi River. Bordered by fertilizer and chemical plants to the north, a coal plant to the south and an oil refinery to the east, the lake that was once a popular recreational destination for Memphians is now a frequent site of trash cleanups. To investigate the amount of pollution that has occurred at a microscopic level, we have investigated the number of sulphate-reducing bacteria (SRBs) present in this environment. SRBs grow in anaerobic environments and use sulphate as their terminal electron receptor, producing hydrogen sulphide in the process. Their presence can serve as an indicator of pollution, as the concentration of sulphate is partially dependent upon sulphur dioxide, a pollutant released by coal plants. SRB's have also been found to be indigenous to oil and sewage, two potential contaminants of McKellar Lake. In addition, the hydrogen sulfide produced by these bacteria is toxic to most organisms and corrosive to the steel pipelines and barges in the lake.

 # 28 *A Discrete Model of Proton Therapy with Diffusion*
Lars Monia, Dr. Erin Bodine
Faculty Sponsor: Erin Bodine, Department of Mathematics & Computer Sciences
High energy proton bombardment of a tumor region is a growing form of treatment in modern oncology. We propose a mathematical model of a tissue region with a developing tumor and applied proton therapy using a discrete time and space formulation with inter-regional diffusion of cellular growth. This model allows a comprehensive expression of both the development of a tumor and the damage dealt to cancer and healthy cells due to high energy particle treatment.

 # 29 *Topological Gauge Theory*
Taqwim Luboti
Faculty Sponsor: Chris Mouron, Department of Mathematics & Computer Sciences
I will describe geometric structures and its implication on homogeneous spaces through topological gauge theories. For Gauge theories, the Lagrangian in invariant under a continuous group of local transformations. I will describe the implications of invariance in topological gauge theories through investigation of Matrix groups and give context to their application. In particular we will be looking at orthogonal groups and how they are symmetric in the lagragian for skew fields.

 # 30 *Diagnosing Osteoporosis with Ultrasound: Backscatter Difference Measurements Using a 3.5 MHz Transducer*
Peyton Marshall, Joseph A. McPherson; Brent K. Hoffmeister, Department of Physics
Faculty Sponsor: Brent Hoffmeister, Department of Physics
Osteoporosis, a degenerative bone disease, is a major health risk in the United States, affecting a significant percentage of the population over the age of 50. In order to detect osteoporosis more quickly and efficiently, techniques for measuring bone density at osteoporotic prone sites such as the hip and spine need to become more available. This study seeks to show the relationship between a backscatter technique called the normalized Mean Backscatter Difference (nMBD) and its ability to determine bone density using a 3.5 MHz probe. nMBD measures the power ratio between two parts of the ultrasonic signal. The signal loss between these two regions is sensitive to

attenuation which is known to correlate with bone density. Thirty cube shaped specimens of bone from 6 human femurs were used for this study. A scanning ultrasonic measurement system was used to measure nMBD at multiple sites on each specimen. Linear regression analysis revealed a strong correlation (R = 0.92) between nMBD and bone density. This result suggests that nMBD may be useful for detecting changes in bone density caused by osteoporosis.

Social Sciences

 # 31 *Tactical Urbanism, Privatization and The Historic Tennessee Brewery*
Adriana Quiroga, Heather Jamerson
Faculty Sponsor: Heather Jamerson, Department of Anthropology & Sociology
In March 2014, the owners of the vacant TN Brewery in downtown Memphis announced a plan to demolish the historic building. A team of community groups rallied to consider how to use Tactical Urbanism as a model to save this landmark. They convened volunteers through social media outlets and converted the outdoor courtyard and two rooms into a food/beer court. This effort, called Tennessee Brewery Untapped, attracted 20,000 visitors. Data from this event revealed a strong community attachment to the building because it represents the collective identity of Memphians, who envisioned the revitalization of the brewery as an open community asset. In November 2014, the building was sold to a local developer, who plans to convert the property into private residential and commercial facilities. Prior to renovations, the developer planned a 6-week Revival of the Untapped project that brought back the food/beer court. This project seeks to extend last year's research and understand how the professionalization of the Revival project changes the visitor experience of the Brewery. Through participant observation and interviews, researchers will examine how the community sentiments to "save the soul of the building" (as expressed during Untapped) are balanced with the privatization efforts.

 # 32 The *Complexity of (Un)charred Seeds: Unearthing the Taphonomic and Cultural Processes at a Stó:lō-Coast Salish Settlement in the Upper Fraser Valley*
Karen Hess; Kimberly Kasper, Department ofAnthropology & Sociology, Rhodes College; Anthony P. Graesch, Connecticut College; David M. Shaepe, Stó:lō Research and Resource Management Centre
Faculty Sponsor: Kimberly Kasper, Department of Anthropology & Sociology
Many archaeologists overlook the presence of uncharred archaeobotanicals, specifically seeds, within excavated cultural contexts. Frequently assemblages of uncharred seeds receive little analytic attention due to the difficulty of differentiating taphonomic variables associated with their presence, including soil moisture, pH, and insect activity. Further confounding this methodological quandary, it is often difficult to distinguish between the "cultural" and the "modern" seed rain recovered within the archaeological samples. As a result, most assemblages of uncharred seeds are excluded from analyses, and their interpretive significance is seldom addressed. This poster addresses the above methodological issues through the investigation of archaeobotanicals from Welqámex, an island-based Stó:lō-Coast Salish settlement in the upper Fraser Valley of British Columbia. Focusing our analysis on residential architecture, we consider the taphonomic and cultural processes accounting for the presence of uncharred archaeobotanicals recovered from house floors, pit features, and roof layers. We argue that rigorous sampling procedures - systematic collection of samples beyond features and across vertical space – afford an opportunity to analytically distinguish between cultural and natural site formation processes. In turn, we demonstrate how both charred and uncharred seeds further our understanding of variation and the choices embedded in foodways and medicinal practices among Stó:lō-Coast Salish extended-family households.

 # 33 *Demographics in Recreational Sports: The Memphis Midtown Kickboxing Gym*
Caroline Bell
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
Ethnography is a broad term encompassing many methods of anthropological research. The central method of ethnographic investigation, participant observation, differs from other scientific methods due to its emphasis on investigating complex social phenomena rather than testing singularly focused hypotheses. The goal of ethnography is to develop an understanding of foreign cultures and provide a critical lens through which to view one's own culture. I have chosen to pursue field research at the Memphis Midtown Kickboxing gym through participant observation. The kickboxing gym plays a significant role in the welcoming environment of Midtown as it brings a wide demographic of individuals together. I purchased a gym membership in order to immerse myself as a participant amongst this cultural scene. Hosting classes for a variety of ages, races, and fitness levels, the gym is an

ideal place to explore the mental and physical boundaries that play a role in recreational sports. What drives us to push past our physical boundaries? How can mere acquaintances motivate us to persevere through agonizing discomfort? Through participant observation, expert interviews and detailed field notes I will explore the relationship between physical strain, mental willpower, and camaraderie.

 # 34 *"Tails" from the Field: An Ethnographic Study of Streetdog Foundation*
Elise Crosswhite
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
The ethnographic method is a tool used by anthropologists that allows them to learn about and interpret a new cultural scene through participant observation and interviews. I utilized this method to better understand and appreciate the culture of Streetdog Foundation in Memphis, Tennessee, which employs the help of volunteers to find loving forever homes for rescued street dogs. Volunteers help in a multitude of ways: through rescuing, walking, washing, socializing, and fostering dogs, as well as through helping facilitate adoption day events, all of which bring the dogs one step closer to finding a home. Through my research, I found that the rewards of working with Streetdog do not end with the ethical value of being able to help the dogs find a home, but extends to the social value found in being a part of a compassionate community that one immediately feels they belong to. This ethnography will present (1) the visible bond between the volunteers and the dogs seen through the community's efforts to find the dogs loving homes, as well as (2) the less visible, but just as important, bond found between volunteers. I will argue that these relationships make up the core of Streetdog Foundation's culture.

 # 35 *Aiming for the Bullseye: An Ethnographic Study of Everything Archery*
Renee Easterlin
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
Ethnography is an important method which allows researchers to get a more well-rounded view of the population they are studying. Participant observation consists of the researcher observing at the field site and participating in the population's activities. I used this methodology at my field site, Everything Archery, an indoor archery range and repair shop. I took the role of a participant observer during their archery league meetings as well as around the repair shop. They also offer a number of classes to home school children as well as individual lessons upon request. I have found that people of all ages and backgrounds have gotten involved in archery for a variety of reasons ranging from curiosity to using it as an escape from stressful situations. The space is set up in a way that largely influences the overall feel of the location and sets the tone for the activities that take place there. Archery demands being very well in tune with one's body and the focus it requires makes it a unique activity. Undertaking ethnography at an indoor archery range has given me a nuanced and detailed appreciation of an impressive sport.

 # 36 *Art for More than Art's Sake: An Ethnographic Study of the Brooks Museum*
Veronica Francis
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
Ethnography is a core methodology of anthropology, which focuses on the minute details of material culture and tradition that makes a people and cultural scene so special. So as ethnographers we take on responsibility for protecting the culture we study and the information we gain. The Brooks Museum has been an institution of Memphis since the 1950's. The Brooks includes a variety of permanent pieces separated into three main collections: America, European, and Ancient. The pieces range from Pre-Colombian to Contemporary. In addition, the Brooks accepts traveling collections from other museums which this year have included Women in Art, Ancient Animal Mummies, and Civil Rights Photographs, among others. The question of my ethnography has been to determine what draws people to the Brooks and who frequents the museum. I have spent numerous hours in the museum observing material culture, including interior decoration, positioning of seating, and building architecture, as well as docent positioning. In addition, I conducted interviews with museum workers to better understand how they negotiate its space and their perspective on the patrons of the museum.

 # 37 *We Aim 2 Pleaze: An Ethnographic Study of a Memphis Beauty and Barbershop*
Maurielle Harris
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
This work explores the cultural dynamics of the beauty and barber shop Crowd Pleazers located at North Watkins Street in Memphis. The main purpose of this study is to learn how to properly do ethnography by engaging oneself into a culture while trying to understand the ways in which meaningful social activity and engagement are constituted. Using the ethnographic method of participant observation, I observed space, sight, smell, sounds,

interactions, and participated in dialogues with patrons of the shop. Expert interviews with the shop owner and stylists were used to obtain a deeper understanding of the social interactions and relations in the shop. Through these observations and interviews, underlining themes such as the importance of conversation and style techniques are explored further. The barber and beauty shop serves as a space for individuals to converse freely about topics including religion, topics in the news, and the surrounding neighborhood. The style techniques used by stylists are time consuming, intricate, and are learned through various schooling and practice. Patrons continually choose Crowd Pleazers because of the skill of the stylists and the stimulating environment of the shop.

 # 38 *Finding the Soul in Food*
Sarah Kim
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
In the overall realm of what we consider food, there is much meaning and a sense of ritualization to the making, consuming, and sharing of food. Imagine walking into a restaurant so friendly and open that you cannot distinguish a stranger from a friend, with constant talk and laughter is to be found. Ms. Girlee's Soul Food Restaurant, located in North Memphis on Chelsea Ave, embodies the notion of southern hospitality. As the restaurant name states, it serves soul food. In this ethnographic study using the method of participant observation, my purpose was to understand the ways in which Ms. Girlee's Soul Food Restaurant operates and interacts with the community members who come to enjoy the food. Through the personal experiences of the ethnographer interacting with the staff and owners, and with the community members, the notion of family, friendship, and community formed around this establishment became evident. This will serve as the theme of my presentation, and serve additionally as an effort to bridge strengthen the relationship between Ms. Girlee's and the Rhodes community.

 # 39 *Exploring the culture of a coffee shop open 24/7: CK's Coffee Shop on Poplar Avenue*
Morgan Kulesza
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
The ethnographic method allows us to appreciate the culture of people referred to as "others," including those of our own society. Using the method of participant observation I was able to broaden my view of cultural variation and go beyond my immediate social context, helping me to understand the daily routines of the culture being studied. The purpose of my ethnography was to discover and understand the culture within a coffee shop, which is open twenty four hours and seven days a week. The cultural scene I focused on was CK's Coffee Shop located on Poplar Avenue. in Memphis TN, which is frequented by a diverse demographic. With participation observation, I observed both the workers, as well as the customers. For several weeks, I purchased a food or drink item, situating myself in the provided seating area, and attempted to gain a nuanced and dtailed feel for the material, cultural, and social scene of the environment. In the process I was able to further question my own projected and assumed stereotypes of those who work at and frequent CK's Coffee Shop.

 # 40 *Growing Your Roots: An Ethnographic Study of What Urban Gardens Do for a Community*
Erin Patin
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
This ethnography investigates Grow Memphis, a local non-profit dedicated to changing the food system in Memphis. By using the ethnographic method, I was able to discover the various nuances of this cultural scene through interacting with and learning from the people who make it up. Ethnographers come to understand the scene they have chosen to study through the practice of participant observation. This method involves the ethnographer learning about the culture by participating in cultural practices. I used participant observation in order to understand how farmer's markets operate, what goes into creating a community garden, how it is maintained, and how it benefits the community. Aside from gaining an understanding of the emerging food system, I came to realize what it takes for a garden to thrive—community. The individuals who come together in order to maintain a garden collaborate with one another in order to improve and give back to the neighborhood they are serving. It just takes a few individuals to effect change in the community. Grow Memphis empowers these individuals to make strides in the effort to create a sustainable food system for Memphis.

 # 41 *A Day at the Museum: An Ethnographic Adventure at the Pink Palace Museum*
Julian Roby
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
The Pink Palace Museum is one of the oldest and cherished landmarks standing in Memphis today. The museum was originally built as a mansion for Clarence Saunders who was the founder of the self-service grocery store Piggly

Wiggly. After the stock market crash, the mansion was altered to a museum and was opened to the public in 1930. Initially set up as world history museum, the museum now focuses mainly on the history of the Mid South: Chickasaw Indian culture, the city's founding by John Overton, the slave cotton industry, the yellow fever epidemic, and the civil rights movement. The leaps and bounds that the city of Memphis has made in medicine, agriculture, and technology are also featured. While using the ethnographic method I was stationed within the cultural scene as a student volunteer, allowing me not only to observe the cultural scene, but also be "a part of" and an active participant in that scene. This study focuses on individuals that allow the museum to thrive. Questions such as what attracted them, why they continue to stay and their thoughts on the new expansion of the museum and the direction its taking are all discussed.

 # 42 *Burke's Books: An Ethnography of a one of a kind, independent bookstore*
Allison Rogers
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
Burke's Books, an independent book store situated in the heart of the Cooper Young district in Midtown Memphis, is relatively widely known and patronized by "hip" Memphians who want to buy inexpensive used books. Yet despite its appeal to a trendy demographic, Burke's Books is steeped in history and has existed in the city since the late 1800s as a family owned business. In a society where everything is becoming larger and cheaper through mass production, small, local business are few and far between, because chain stores are more popular among the masses. For this reason alone, Burke's Books is worth studying, especially through the ethnographic method. By engaging in conversation with regular patrons, my objective has been to cultivate an appreciation for an unfamiliar place, and to become informed on the inner workings of that place. The ethnographic method informs one's understanding of cultures through becoming immersed in the details of human interactions in the social world. In the age of technology and mass media, I intend to answer the question: why do so many people love the store and what does it have to offer its customers that a Kindle cannot?

 # 43 *Alternative Medicine: A Lost Art of Healing?*
Eric Ly, Bette Ackerman, Rhodes College; Frank Ly, Orlando Ly, Memphis Acupuncture and Chinese Medicine Center
Faculty Sponsor: Bette Ackerman, Department of Psychology
Alternative medicine and therapies can provide healthcare just as effective, if not more effective, as conventional, allopathic medicine. While a wide range of alternative medicine and therapies exists, Traditional Chinese Medicine (TCM) has emerged as a frontrunner in popularity and efficacy. Although acupuncture is well-known, other forms include moxibustion, cupping, dietary supplements, qi gong, and herbal medicine. All therapies – whether the standard western allopathic medicine, chiropractic, or the alternatives included in TCM – can be evaluated in terms of effectiveness, side-effects, and intensity of side-effects. I will survey patients in a TCM clinical practice in an attempt to understand the conditions under which they turn to TCM in place of, or in addition to, standard allopathic care. Critics often say that allopathic medicine has lost the art of healing in terms of nurturing the relationship between clinician and patient, while TCM has continued to prioritize this relationship as critical. The second part of my presentation will focus on these differences.

 # 44 *Anomorphic Projection Display Piece*
Lauren Ulrich
Faculty Sponsor: Jason Haberman, Department of Psychology
Anamorphic projections are distorted images that only appear normal from a specific point of view or when reflected on a particular surface. This work projects an image of the classic Rubik's Cube onto a cylindrical mirror. However, the original image, depicted on the adjacent anamorphic grid, is nearly uninterpretable without the normalizing effect of the mirror. Historically, anamorphic designs were used to conceal politically charged images until they reached the intended audience, since the proper image could only be seen through unorthodox methods. Perspective anamorphoses have widely used these unique points-of-view in both artistic and architectural endeavors to create illusions and impossible images. By using this forced perspective, flat surfaces may be transformed into domed ceilings and the line between the perceived image and the reality of the architecture is blurred.

 # 45 *Cultural Capital and its Relationship to Academic Achievement: The Case of Shelby County High Schools* ◙
Katherine Fritzlen
Faculty Sponsor: Natalie Person, Department of Psychology

Research has found a positive relationship between possession of capital and academic achievement. Cultural capital is the access to cultural resources and activities as well as familiarity with and knowledge of the dominant culture. We looked at the relationship between cultural capital and academic achievement in Shelby County high schools. Shelby County, which contains Memphis and the surrounding municipalities, is one of the poorest metropolitan areas in the United States and experiences one of the largest achievement gaps in the country. We found that cultural capital and Advanced Placement (AP) courses were positively correlated with all measures of achievement. Cultural capital and AP courses predicted ACT scores while only AP courses predicted most Tennessee Comprehensive Assessment Program (TCAP) scores. Technology negatively predicted ACT scores. We discuss the implications of these findings for the importance of creating more cultural capital in the educational system.

 # 46 *"Who is that ugly guy?": A Study of Character Descriptions in Middle Childhood Personal Narratives*
Brooke Bierdz, Taylor LaPorte, Celeste Lake
Faculty Sponsor: Marsha Walton, Department of Psychology
In middle childhood, peer interactions become the site for important development in psychological mindedness, including the ability to understand self and others in increasingly sophisticated ways. The present study examined children's spontaneous character descriptions by analyzing 380 personal narratives written by 3rd- 6th grade children. Three types of character descriptors, all of which must imply stability over time, were coded. Trait terms included descriptive nouns or adjectives (e.g. "pretty," "mean"). Internal state descriptors included emotions, preferences, and beliefs (e.g. "always mad," "can't stand losing"). Behavioral descriptors consisted of skills/abilities and habits (e.g. "good at math", "never listens"). For each character description, the gender (male, female, both) and position (self, other, collective) of the describer and the described individual were coded using NVivo qualitative data analysis software. Mixed-methods analyses were conducted to investigate differences in the complexity of character descriptions according to the gender and grade of the author. Additionally, the kinds of descriptors used to describe the self versus others and boys versus girls were analyzed. These results are discussed in light of previous research that has suggested that the complexity of trait terms increased with age. Implications and suggestions for future research are discussed.

 # 47 *"Yall dont need to be fighting like little boys": The Social Construction of Gender in Children's Narratives*
Katie DuBose, Chigoize Emelue
Faculty Sponsor: Marsha Walton, Department of Psychology
Recent research in the field of gender has focused on children's understanding of gender by asking them about stereotypes, or by assessing their reactions to hypothetical scenarios. We were interested in seeing how children constructed gender when no one asked them about it directly. Using mixed-methods, we analyzed 911 personal narratives written by 3rd through 6th graders in 4 schools, paying extra attention to themes of romance and sexuality. Using NVivo qualitative analysis software, we identified and counted gender markers and classified them into 7 different functions: gender insults, gender norms and rules ("fighting like little boys"), gendered address ("man why you hit me"), gendered self/identity reference, gendered interjections ("oh, man!"), and gender reports. Preliminary findings suggested that children used these markers most frequently to report the gender of others in their stories, especially family members. We also observed a greater number of gender reports in the High Risk/Low SES stories in comparison to the stories from the Low Risk/High SES schools. We are investigating whether there are grade and SES differences in the use of these terms. We hope this will lead to further research on the ways in which different groups of children think about gender.

 # 48 *"I felt left out because she picked another friend to take my place": Psychological mindedness and belongingness in children's narratives*
Eliza Hendrix, Abby May; Marsha Walton, Department of Psychology
Faculty Sponsor: Marsha Walton, Department of Psychology
A defining feature of the elementary school years is the development of peer relationships. These relationships are facilitated by developing psychological mindedness and perspective-taking – the tendency to attend to thoughts, motives, emotions, and traits of the self and other. Narrative is critical in making sense of experiences, and children come to understand people's psychological states as they share their own stories. The present study examined 317 personal narratives told by children in 1st through 6th grades at a summer camp in Memphis, Tennessee. These narratives were collected through a story-sharing program called KidsTalk. Stories were coded for psychological mindedness and perspective-taking. Using Nvivo, a qualitative data analysis program, and a mixed methods approach, I examined themes of exclusion and inclusion in stories about a variety of experiences in multiple settings. Results revealed that participation in KidsTalk was related to increased attention to emotion in children's stories.

Children whose first participation was later had higher levels of psychological mindedness in their first stories than the first stories of peers who attended KidsTalk from an earlier date, suggesting that the implementation of KidsTalk influenced the camp setting by encouraging story-sharing practices. Implications for educational practice and suggestions for future research are discussed.

 # 49 *"You have to let me play": Moral Development in Children's Conflict Narratives*
Lauren Shames, Paige Goemaere
Faculty Sponsor: Marsha Walton, Department of Psychology
During middle childhood, children come to develop a sense of personal morality. Narrative is critical in this development, and allows them to make moral evaluations of themselves and others, and position themselves within moral conflicts. The current study analyzed 317 personal narratives written by 1st-6th graders at a summer camp in Memphis, TN, collected through a story-sharing program called KidsTalk. We coded narratives for presence of moral voice by analyzing specific markers of morality work. Using nVivo, a qualitative data analysis program, and a mixed-methods approach, we coded narratives for deontic auxiliary words (ex. should, must) and descriptive morality words (e.g. kind, generous). Stories were rated for the explicitness of the author's self justification, self critique, and for the justification and critique of others. These six assessments of moral voice are compared in stories that describe conflicts with peers, conflicts with adults, and peer conflicts in which adults intervene. With the results of the current study, we seek to add to the growing field of research on middle childhood, and present new information about the moral development and evaluations children make when they give accounts of their own experiences. Implications and suggestions for future research are discussed.

 # 50 *Examining Neighborhood Health in Shelby County*
Sarah Ferguson, Anna Clare Pearson
Faculty Sponsor: Peter Hossler, Urban Studies Program
Healthy communities are important in order for those living in specific areas to have healthier and happier lives. According to the CDC, healthy places are "those designed and built to improve the quality of life for all people who live, work, worship, learn, and play within their borders." For this research project, neighborhoods in Shelby County will be assessed on their health as a community. To do this, five types of locations will be mapped, in order to see which are represented in different communities. These places are, schools, parks, churches, community centers and community gardens. Neighborhoods will also be assessed by their specific incomes and demographics. This research looks into the relationship of income and demographics and their relationship to healthy communities. These five specific factors were chosen because they all help to improve community health based on the reasoning the CDC gives on what makes a healthy community design. This is because all of these locations contribute to the following actions determined by the CDC: "increasing physical activity, increasing access to healthy food, strengthening the social fabric of a community and providing fair access to livelihood, education and resources."

 # 51 *The True Cost of Illness: Access to Health Insurance in Shelby County Based on Minority Status and Socioeconomic Status*
Roz KennyBirch, Rebecca Kempf
Faculty Sponsor: Peter Hossler, Urban Studies Program
In our URCAS presentation, we hope to analyze the factors of Health Insurance, Language Spoken at Home (with a grouping of age five or older), Household Internet Access, Educational Attainment, Birthplace by Nativity & Citizenship Status, Ancestry, Employment Status, Usage of Food Stamps, Disability Status, and the locations of medical safety nets in Memphis (i.e. clinics or emergency rooms) to determine possible correlations that may exist between the ease of obtaining health insurance for those that qualify as different types of minority groups, or lack certain luxuries in Shelby County. We hypothesize that those who qualify as a ethnic or other minority group (such as the disabled), live in certain locations, and lack access to funds or material possessions will be less likely to own Health Insurance in Shelby County. We will test our hypothesis, and then subsequently demonstrate proven correlations through the use of a multitude of maps that will use visual demonstrative tools such as graduated color symbology, buffer zones, projections, and joins. In order to achieve a full analysis of the relationship of these factors, we are using data collected from the American Community Survey (from the year of 2013, with one year estimates).

 # 52 *The Road to Healthy Food: A GIS Analysis of Transportation and Food Availability in Shelby County*
Sarah Laves, Ellery Ammons
Faculty Sponsor: Peter Hossler, Urban Studies Program

While transportation wonderfully connects people to each other, it also can create negative reverberations through the opportunities, available or not, to certain individuals and groups. To study the accessibility of food resources in the Memphis community in relation to poverty and education levels, maps of the transportation routes (i.e. roads, bike lanes, MATA lines) and sources that carry health foods (i.e. grocery stores, farmers' markets) have been compiled. The location of the varying food sources, while they fully span Shelby County, are more likely to be located in specific areas: This availability of resources is mapped on GIS by overlaying general demographic information and creating buffers surrounding potential food sources to find patterns of availability. By joining these data, areas in Memphis that lack fresh food are made evident. Using the location of these food-lacking areas in conjunction with Memphis transportation lines, the authors suggest the most effective new fresh food source sites. Through the juxtaposition of neighborhood demographics and food availability, the authors additionally hope to add to the current literature on healthy food disparities.

 # 53 *The Community Narrative Research Project: Participatory Approaches to Understanding Learning and Change*

Chigozie Emelue, Eann Malabanan, Adele Malpert, Natasha Main, Ginika Nwoko; Elizabeth Thomas, Urban Studies

Faculty Sponsor: Elizabeth Thomas, Urban Studies Program

Collaborative, participatory approaches to research are valued in community psychology as they build community capacity and strengthen research. Increasingly, young people are taking on the role of researcher, contributing meaningfully to action research and evaluation in their own community, educational, and organizational contexts. While research with undergraduate students is certainly not new to the field, we have not fully conceptualized undergraduates as partners in research about their own experience of learning and the role of the university in supporting that experience. This study focuses on the Community Narrative Research Project (CNRP), a longitudinal study examining student's changing understanding of community-based service in the context of a four-year community service scholarship program and a liberal arts education. In the scholarship program, students move from initial, short-term volunteer commitments across a variety of settings in their first year to deeper, long-term commitments and leadership roles that include advocacy and policy-related work by their senior year. Preliminary results from our narrative analysis show mutual benefits of service on the author and the other, with the other being a patron, organization, or larger social system. We hope to be useful to the service program and college by contributing to reflective practice, learning, and change.

 # 54 *Assessing Diversity in the Crosstown Neighborhood: 1980 - 2010*

Sydney Sepúlveda, Mariko Krause

Faculty Sponsor: Elizabeth Thomas, Urban Studies Program

Crosstown in one of the most diverse neighborhoods in Memphis. The goal of this project is to analyze changes in diversity by examining the effects the historic Sears building had on the neighborhood. We will analyze data from 1980, when Sears' retail business closed their doors, 1990, when Sears' distribution center closed, to 2000, when the building was completely abandoned, and 2010, when the building had been abandoned for more than 10 years. By focusing on median household income, demographics such as age, sex, and race/ethnicity, and by comparing these indicators to Shelby County data, we will examine trends to determine how Crosstown has changed in the past 30 years. This information will be valuable to Crosstown Development and neighborhood organizations, especially with the transformation of the Sears building into Crosstown Concourse, a mixed-use vertical urban village that combines health, the arts, education, retail, and living in one building. This research provides the grounds for further inquiry that analyzes future changes in diversity and the potential for gentrification in the Crosstown neighborhood once the building has been completed.

 # 55 *#Community: Through the Eyes of the VECA Youth Group* ◙

Dy'Nelle Todman, Sam Brobeck

Faculty Sponsor: Elizabeth Thomas, Urban Studies Program

Where and how youth spend their time outside of normal school hours has important implications on their academic, personal, social and recreational development (Durlack & Weissberg, 2007). This knowledge has sparked interest across communities to develop after-school programs for the youth living in their neighborhoods. Over the last few years, this interest has begun to spread throughout Memphis. The Vollintine-Evergreen community that surrounds Rhodes undertook the task of creating an after-school program, with the unique twist of allowing the youth to spearhead the design and development. Through the lens of our Community Development Fellowship with the newly established Vollintine-Evergreen Youth Group, acting as participant observers supporting the development of

the after-school program, we examined the structural elements and community resources that contribute to after-school program success. Additionally, we examined efforts in Memphis, as a whole, to improve after-school programs through building city-wide supports that could, both, create and strengthen Memphis' after-school infrastructure.

Biology 141

 # 56 *Effect of Varying Water Temperature on Crawfish Aggression*
Conor Dorian, Aidan O'Reilly, Elizabeth Vesceri, Henry Weinreich
Faculty Sponsor: Michael Collins, Department of Biology

 # 57 *Cricket Sensitivity to Ground Temperature*
Jenny Loome, Lilly Elkin, Griffin Williams, Jessie Ustick
Faculty Sponsor: Michael Collins, Department of Biology

 # 58 *Determination of pH effect on crayfish behavior*
Chen Qian, Joey Penn, Jimmie Stuckey, Chip Capper
Faculty Sponsor: Michael Collins, Department of Biology

 # 59 *The Environmental Impact on Crayfish Dominance: Sand vs. Marble & Gravel vs. Tank Rocks*
Kyanna Young, Jonathan Chu, Kelsea Lewis
Faculty Sponsor: Michael Collins, Department of Biology

 # 60 *The Effect of a Female's Presence on Crawfish Aggression*
Juliana Ratton, Ian Harrison, Carissa Howie
Faculty Sponsor: Michael Collins, Department of Biology

 # 61 *Effect of nitrogen and phosphorous on growth of* Lemna minor
Rahul Peravali, Ashley Bruneau, Phoebe Sharp, Allison Long, Beth Friedman
Faculty Sponsor: Michael Collins, Department of Biology

 # 62 *Agonistic Behaviors Caused by Territorial Tendency in Crayfish*
Rose Zeng, Tim Soper, Natalie Scanlon, Bridget Costello
Faculty Sponsor: Michael Collins, Department of Biology

 # 63 *Male Crayfish Behavior Changes in the Presence of a Female Crayfish*
Grace Kennedy, John Gillenwater, Erin Deery, Thy Duong, Catrina Cattaneo
Faculty Sponsor: Michael Collins, Department of Biology

 # 64 *Crayfish Dominance is Positively Correlated to A Higher Success in Food Obtainment*
Leon Shum, Zaid Ahmad, Betsy Limbaugh, Joy Hoycut
Faculty Sponsor: Michael Collins, Department of Biology

 # 65 *The Effect of Abscisic Acid on the Stomatal Apertures of Pansy Plants Exposed to Wind*
Matthew Huber, Margaret Payne, Don Shin, Zain Virk
Faculty Sponsor: Michael Collins, Department of Biology

 # 66 *Effect of dominance on light or dark preference*
Natalie Richmond, Caroline Cardwell, Semaye Mengistu
Faculty Sponsor: Michael Collins, Department of Biology

 # 67 *Effect of IAA hormone on Duckweed Root Growth*
Zaid Baba, Thomas Matthews, Lauren Travis
Faculty Sponsor: Michael Collins, Department of Biology

 # 68 *The Effect of Warm Water Temperature on Male Crayfish Fighting Behavior*
Ellery Hayden, Ben Aiken, Soraya Miri, Taylor Treas
Faculty Sponsor: Carolyn Jaslow, Department of Biology

 # 69 *The Effect of Live or Artificial Stimuli on Crayfish Behavior*
Christian Allen, Carolyn Hilley, Samantha Regala, Elasha Williams
Faculty Sponsor: Carolyn Jaslow, Department of Biology

 # 70 *The Effect of Other Aquatic Plants on Duckweed Leaf Growth*
Claire Caprio, Taylor Majewski, Sydney Roper, Ellie Valega
Faculty Sponsor: Carolyn Jaslow, Department of Biology

 # 71 *Substrate Preference of Male Crayfish as Influenced by the Sex of an Additional Crayfish*
Evan Tucker, Mary Elizabeth Massey, Sarah Ryan, Haley Cremerius
Faculty Sponsor: Carolyn Jaslow, Department of Biology

 # 72 *The Effect of the Presence of a Female Crayfish on the Intensity of Bouts between Two Male Crayfish*
Brennan Sullivan, Emma Goldman, Anna Wohlbold, Bryce McPherson
Faculty Sponsor: Carolyn Jaslow, Department of Biology

 # 73 *Activity in Light or Dark Environments for Crayfish*
Emma Selner, Allesondra Gilgan, Hannah Maxwell, Xinzi Wang
Faculty Sponsor: Carolyn Jaslow, Department of Biology

Anthropology Display

The Art of Anthropology
Faculty Sponsors: Julia Hanebrink and Ashante Reese, Department of Anthropology & Sociology
The common ground on which art and anthropology engage can be defined in terms of their observational and knowledge producing practices. Both art and anthropology rely on observational skills and varying forms of visual literacy to collect and represent data. Anthropologists represent their data mostly in written form by means of ethnographic accounts, and artists represent their findings through a variety of artistic mediums. Furthermore, arts-informed inquiry looks towards the arts not only as a form of individual expression, but also as a key instrument in confronting current and historically significant issues. Art creates stories which tell about how people can resist inequality, challenge the dominant ideologies that support it, fight for more equal and inclusive social arrangements, and challenge an unjust status quo. Rupturing the status quo and producing alternative constructed situations enables us to interrogate hegemony and expose oppressive practices of power and domination, thus enabling new possibilities for an inclusive human community.

Students in Professor Ashante Reese's and Professor Julia Hanebrink's Introduction to Anthropology (ANSO 103) courses have created works of art that represent important social issues. The goal of this visual anthropology project is to enable the exploration of ways to visually represent and interpret stories of power, domination, resistance, and inequality on a personal level through an artistic medium.

POSTER SESSION II

Multisports forum of the Bryan Campus Life Center
4:30pm – 6:30pm
Poster numbers are listed with each title.

Fine Arts

 # 1 *Harps in Modern Pop Culture*
Maura Angel, Petra Dhinakaran, Kelly Dodson, Jenny Li, Sidney Long, Nicole Quinones, Maggie Wang, Yai Zhao
Faculty Sponsor: Gina Neupert, Department of Music

Harps have made their way into modern culture. From performing in rock bands to movie musical scores, this research explores the presences of the harp in today's pop culture. Deborah Henson-Conant's "rock" appearance of leather clothes and long, dreadlocked hair, along with her blue electric harp, was a bold new direction for a harpist in the 1980s. Danny Elfman, one of the most celebrated film composers of our time, has been made famous by his astounding work in Batman, Beetlejuice, The Nightmare Before Christmas, and Edward Scissorhands. Elfman's style of music focuses on color and color blending to make sure none of the instruments overpower one another, allowing the harp to shine through in many of his pieces. The rise of social media site YouTube, helped Kurt Schneider challenge the notion that harps are only played by women. By being one of the few male harpists who displays his talents in public, Kurt shows his audience that gender is not a factor of music. Tom Munger is not only a male harpist, but also a band member of indie rock sensation Florence in the Machine. Harps may not take center stage in modern pop culture, but the instruments' grace and angelic qualities continue to change the sound of modern music.

Humanities

 # 2 *The Algerian War of Independence and Mouloud Feraoun's Changing Understanding of Violence*
Maria Barnett
Faculty Sponsor: Etty Terem, Department of History
Using Mouloud Feraoun's Journal 1955-1962, my research paper examines how the progression of violence throughout the Algerian War of Independence changed Feraoun's understanding of violence. At the outset of the war violence was mainly contained to fighting between the French military and National Liberation Front (FLN), but as it progressed the French military and FLN increasingly subjected Algerian and European citizens to violence, respectively. My thesis argues that Feraoun's initial understanding of violence as an appropriate means for the Algerians the rebel against the French changes to condemnation as the French military and FLN increasingly subject civilians to violence.

 # 3 *Modern Ways to Santiago*
Lauren Hales, Jourdaen Sanchez, co-author
Faculty Sponsor: Clara Pascual-Argente, Department of Modern Languages
El Camino de Santiago, or the Way of St. James, is a pilgrimage route in modern Spain that has existed, through varying levels of interest, for the last 1,000 years. The Camino in northern Spain functions as an important pilgrimage route (economically, politically, and socially), and also an important part of culture: manifesting itself in popular film and narrative. Through the different modern interpretations of the Camino that we have studied, including: Lucy Pick's Pilgrimage, Matilde Asensi's Iacobus, the feature film The Way, and the documentary Six Ways to Santiago, we see a clear interpretation of the modern day Camino de Santiago as a pilgrimage route that serves more as an individual's journey of self-discovery rather than a demonstration of religious devotion or commitment.

 # 4 *Progress within the Patriarchy: Changes within the Argentinian legal system advocating for women's rights* ◙
Micah Leonard
Faculty Sponsor: Elizabeth Pettinaroli, Department of Modern Languages
The formation of laws are significantly influenced by constitutions and the rights encoded therein, created to support the morals that a society as a whole upholds. These laws can potentially shape our politics, economics, history and society in various ways and serves as a mediator of relations between people. When laws are changed they should serve as a reflection of changing views within that society. This essay seeks to explore Argentinian society and its collective view on the controversial issues surrounding women, particularly regarding the legal changes recently made on femicide, domestic violence and abortion. Through the investigation of the rising awareness and support of women's rights, using interviews, literature and law, I seek to explore the ways in which gender roles and patriarchal structures shape both the discussion and approach regarding these topics.

St. Jude Summer Plus

 # 5 *Pharmacogenetics of methotrexate resistance in pediatric acute lymphoblastic leukemia* ◙
Tyler Harvey, Rhodes College; Elixabet Lopez-Lopez, Steven W. Paugh, Erik J. Bonten, William E. Evans, Department of Pharmaceutical Sciences, St. Jude Children's Research Hospital
Faculty Sponsor: Terry Hill, Department of Biology
Acute lymphoblastic leukemia (ALL), a cancer of white blood cells, is the most common type of cancer in children. Current chemotherapy treatments of pediatric ALL patients have produced 5-year survival rates near 90%. The reasons for the poor prognosis of ~10% of ALL patients remain unknown. However, one of the leading causes of treatment failure appears to be de novo or acquired drug resistance. In this study, we used genome-wide approaches to identify genomic determinants of methotrexate (MTX) resistance, an anticancer drug used in most treatment regimens for newly diagnosed ALL. By altering the expression of candidate resistance genes, significantly above or below typical thresholds, it may help us understand the effects these genes and their protein products have on MTX sensitivity. Genome-wide association studies (GWAS) were used to identify top candidate genes, including BUB1 and BCL11B. Using a CRISPR/Cas9 system, we created constructs to knockout these genes in human ALL cell lines. During this project, these cell lines will be tested for MTX resistance, giving insights into whether these genes influence MTX sensitivity of ALL cells. This research could provide new insights on the contribution of genome variation to MTX resistance and help further personalize MTX treatment of ALL.

 # 6 *The weight of obesity on influenza virus evolution* ◙
Cydney Johnson, Rhodes College; Erik Karlsson, Stacey Shultz-Cherry, Department of Infectious Diseases, St. Jude Children's Research Hospital
Faculty Sponsor: Carolyn Jaslow, Department of Biology
RNA viruses, like influenza, are highly mutable. Previous studies have demonstrated that nutritional status of the host can affect RNA virus mutation by changing host immune or redox status. One nutritional state that could impact viral mutation is obesity through increased inflammation and decreased immune response. Studies in animals and humans show obesity as a major risk factor for development of a severe influenza infection. Therefore, we hypothesized that obesity could lead to mutations in influenza virus. To understand how viruses change between hosts, influenza was passaged through control and obese mice. Virus passaged through obese hosts caused increased morbidity and mortality in lean and obese hosts compared to "lean" control virus. In addition, the "obese" virus showed increased replicative capacity in vitro. Changes in viral populations can also occur in individuals. Therefore, we looked at the effect obesity has on infection duration and severity during a singular influenza virus infection. Obese hosts had positive influenza titers two to four days longer than lean counterparts, a risk factor for viral mutation and potential viral spread. Future studies will focus on full genomic sequencing of "lean" and "obese" viruses to detect viral mutations stemming from replication in the obesigenic environment.

 # 7 *Does Overriding an Interruptive Clinical Decision Support Prescribing Alert Mean the Alert is not Valuable? A Comparison of Override Rates to an Updated Measure of Clinician Alert Adherence.* ◙
Mary Crowell, Mariam Ebeid, Rhodes College; Michael Dejos, Jonathan Burlison, James Hoffman, Department of Pharmaceutical Sciences, St. Jude Children's Research Hospital
Faculty Sponsor: David Kabelik, Department of Biology
Within the medication use process, there are many opportunities for errors, where prescribing errors are common. Two types of prescribing errors that can lead to patient harm are not accounting for drug-drug interactions (DDI) or patient drug allergies. While working in the Calvo McKenna Hospital in Santiago, Chile during the summer of 2014, we manually identified and recorded drug-drug interactions on patient charts. In contrast, St. Jude prescribers use an automated Clinical Decision Support (CDS) prescribing alert system, which detects DDIs and drug allergies. These systems have the potential to prevent patient harm, yet ensuring that all alerts are clinically meaningful is challenging. This project compared a common CDS evaluative metric, override rate, to a developed metric, adherence rate, for a subset of drug allergies. The purposes of this project were to evaluate the validity of these metrics for evaluating CDS systems and to assess prescriber performance. Results indicate differences in the two metrics, suggesting that the revised adherence rate is a more accurate reflection of clinician responses to alerts than override rate. Prescribers were largely adherent to the alerts and the methods used to compute adherence rate can also identify prescribing errors, so that improvement opportunities can be explored.

 # 8 *Possible role of transmission of H9N2 Influenza virus from pet birds to mammals* ◙

Brian Lenny, Rhodes College; Karthik Shanmuganatham, Robert Webster, Jeremy Jones, Department of Infectious Diseases, St. Jude Children's Research Hospital

Faculty Sponsor: Gary Lindquester, Department of Biology

Influenza subtypes occasionally emerge from animals and cause pandemics in humans. Surveillance of this virus in birds and other animals is critical for pre-pandemic planning. Influenza A H9N2 viruses are endemic in poultry throughout Eurasia. They possess proven reassortment potential, and have demonstrated mammalian tropism. For these reasons, the H9N2 subtype remains a significant public health and pandemic risk. While the poultry trade provides well-documented opportunities for spread of H9N2 viruses within countries, pet markets provide additional opportunity for cross-border movement of H9N2 viruses. We examined the ability of a pet market H9N2 influenza isolate to replicate and transmit among pet birds (finches, parakeets and doves). Environmental samples were taken from the cage and water to assess possible transmission routes. To model replication in mammals, we assessed infection ex vivo with tissues from pigs and humans, and we examined virus transmission in vivo with ferrets. We found that H9N2 replicates in pet birds, but does not transmit to naïve cage mates. Some species shed virus into water troughs which could serve as a source of fomite-driven transmission to humans. The H9N2 virus also showed replication in various tissues from mammals. These studies will not only give us insight into the route of transmission of this virus within avian species, but even zoonotic transmission to mammals.

 # 9 *Exploring miR-206 targets and their roles in rhabdomyosarcoma* ◙

Jonathan Go, Rhodes College; Jason A. Hanna, Matthew R. Garcia, Mark E. Hatley, Department of Oncology, St. Jude Children's Research Hospital

Faculty Sponsor: Kimberly Brien, Department of Chemistry

Rhabdomyosarcoma (RMS) is the most common pediatric soft tissue sarcoma and histologically resembles an arrested state of muscle development. Despite many clinical trials, no significant improvement in survival has been made over the past several decades. We study microRNAs (miRNA) as possible novel therapeutic candidates for RMS. MiRNAs are small non-coding RNAs that regulate expression of target genes by either promoting mRNA degradation or repressing translation. MiR-206 is a skeletal muscle specific miRNA that promotes myoblast differentiation and functions as a tumor suppressor in RMS. Preliminary reports suggest that miR-206 replacement could have therapeutic value in RMS; however, the mechanism of action remains elusive. We identified potential miR-206 target genes by transfecting human RMS cells with a miR-206 mimic and analyzing gene expression with mRNA microarrays and determine protein levels with tandem mass tag proteome profiling. We validated putative miR-206 target genes by cloning the 3' UTRs containing the predicted miR-206 sites into a luciferase reporter and tested specificity with mutations of the miR-206 binding sites. These miR-206 target genes are being further assessed with gain-and-loss of function phenotype characterization to determine the role of the targets in RMS and further establish the potential of miR-206 as a therapy.

 # 10 *Multidrug resistant bacteremia among pediatric cancer patients in Mexico City* ◙

Elizabeth Bittner, Rhodes College; Martha Aviles-Robles, Department of Infectious Diseases, Hospital Infantil de México Federico Gómez; Sericea Stallings-Smith, Department of Epidemiology and Cancer Control, Miguela A. Caniza, Department of Infectious Diseases, Rohit P. Ojha, Department of Epidemiology and Cancer Control, St. Jude Children's Research Hospital

Faculty Sponsor: Mauricio Cafiero, Department of Chemistry

Multidrug resistant (MDR) bacteremia is speculated to be an emerging threat to pediatric cancer patients, but little information is available about the burden, particularly in developing countries. We aimed to estimate the Gram-specific prevalence and proportion of MDR bacteremia among pediatric cancer patients with febrile neutropenia. Our eligible population included all episodes of febrile neutropenia admitted to the hematology/oncology unit of Hospital Infantil de México Federico Gómez (Mexico City) between November 2009 and September 2010. MDR bacteremia was defined as microbiologically-documented bacteremia that was non-susceptible to ≥1 agent in ≥3 antibiotic categories. We estimated the Gram-specific prevalence and proportion of MDR bacteremia with corresponding cluster-adjusted 95% confidence limits (CL). Our study population comprised 216 episodes of febrile neutropenia (n=141 patients), of which 23 episodes were microbiologically-documented bacteremia. The prevalence of MDR Gram-positive bacteremia was 0.46% (95% CL: 0.06%, 3.3%), and the proportion was 4.3% (95% CL: 0.55%, 27%). The prevalence of MDR Gram-negative bacteremia was 1.8% (95% CL: 0.69%, 4.8%), and the proportion was 17% (95% CL: 6.2%, 40%). Our findings suggest higher prevalence and proportion of MDR Gram-negative than Gram-positive bacteremia among pediatric cancer patients. Antimicrobial stewardship programs may be indicated to prevent an increase in multidrug resistance.

 # 11 *Validating the use of molecular field similarity to identify novel drug leads* ◙

Rachel Nelson, Rhodes College; Anang Shelat, Department of Chemical Biology and Therapeutics, St. Jude Children's Research Hospital

Faculty Sponsor: Mauricio Cafiero, Department of Chemistry

Two dimensional 'topological' chemical similarity– directly comparing the bonds and atoms between molecules– is a common way of identifying novel compounds that 'look' like target molecules. This structural comparison approach fails to identify molecules with different scaffolds or large changes in substituents. However, it is known that two structurally distinct molecules have similar molecular interaction fields in their bound conformations if they interact with the same target. Molecular interaction field properties– such as van der Waals, electrostatic potential, and hydrophobicity– can be used to compare molecules as an alternative to 2D chemical topology. Here, we report validation experiments using the Forge program from Cresset software. Forge uses the eXtended Electron Distribution (XED) force field to identify molecular interaction field extrema, termed "field points", which are then used to efficiently compare the interaction fields between compounds. We devised one test set of 16 drugs known to hit distinct targets, then quantified how conformational expansion and alignment parameters affect the program's ability to identify bioactive conformers. We devised another test set of structurally distinct drugs to determine the program's ability to identify molecules that hit the same biological target. We found that the program is highly sensitive to conformational expansion.

 # 12 *EZH2 Knockdown in Embryonic Stem Cells Has No Effect on Cell Pluripotency* ◙

Arishna Patel, Rhodes College; Jon Klein, Cat Willis, Jamy Peng, Department of Developmental Neurobiology, St. Jude Children's Research Hospital

Faculty Sponsor: Dhammika Muesse, Department of Chemistry

Stem cells are self-renewing, specialized cells that can differentiate into multiple cell types for development and regeneration by undergoing gene expression changes. Gene expression changes in stem cells are achieved, in part, via chromatin modifications, which include histone methylation, phosphorylation, and acetylation. The Polycomb Repressive Complex 2 (PRC2) is a protein complex associated with chromatin modification and is vital to development. Deregulated expression of PRC2 components has been linked with various cancers such as melanoma and lymphoma. The PRC2 contains an enzymatic subunit, which can be enhancer of zeste homolog 1 or 2 (EZH1 or EZH2). The PRC2 promotes gene silencing by di- and tri-methylating lysine 27 of histone H3. We investigate the role of EZH1 and EZH2 to understand the function of PRC2 in embryonic stem cell (ESC) maintenance and differentiation. By knocking out EZH1 and EZH2 in ESCs and performing reverse transcriptase-quantitative PCR (RT-qPCR) assays, we profiled mRNA expression of multiple pluripotent and differentiation markers. We confirmed multiple ESC clones with EZH2 knockdown and found via RT-qPCR that the cells remained pluripotent since expression of pluripotency markers (OCT4 and NANOG) were similar to control. We are still working to achieve EZH1 knockdown.

 # 13 *Microsomal modeling of two novel compounds against Trypanosoma brucei* ◙

Regan McCormick, Rhodes College; Gloria Holbrook, Angela Carillo, Fangyi Zhu, R. Kiplin Guy, Department of Chemical Biology and Therapeutics, St. Jude Children's Research Hospital

Faculty Sponsor: Larryn Peterson, Department of Chemistry

African trypanosomiasis, also known as sleeping sickness, is a lethal disease endemic to sub-Saharan Africa. It is caused by the gambiense and rhodesiense subspecies of Trypanosoma brucei, a protozoan, and has few treatment options currently available. St Jude has recently developed two compounds, SJ565254 and SJ565672, which show inhibition against T. brucei gambiense at 38 nM and 1 nM, respectively, and 18 nM and 11 nM, respectively, against rhodesiense. Here, both compounds were tested in liver microsome stability and protein binding assays to determine half-life (T1/2) and percentage of compound bound, respectively, in microsomal protein. The microsome stability assay tracked the degradation of the test compound by CYP enzymes and the half-life is determined using LC/MS. Stability was tested in pooled microsomes from mice, rats, dogs, and humans at three compound concentrations: 0.8 µM, 4.0 µM, and 20µM. Half-life for SJ254 was greater than four hours at all concentrations in all species except mouse. SJ672, however, showed less favorable microsomal stability. At low concentration (0.8 µM), T1/2 was less than one hour for all species except rat (T1/2 = 1.4 hr). Next, protein binding was analyzed using an equilibrium dialysis method with the same microsome species and compound concentrations as stability. Greater than 98% of SJ254 was bound to the microsome proteins for all species and concentrations tested. SJ672 exhibited greater than 90% binding for all species and concentrations. Finally solutions obtained from the stability assay will be used to track possible metabolites. Limited animal studies showed that these compounds have potential to move forward in

the development process; however, further physiochemical characterization, metabolite identification, and structural modification should be determined to improve the drug-like properties of these compounds.

 # 14 *Evaluation of 6-[^{18}F]fluorodopamine (^{18}F-DA) as an Effective PET Radiotracer For the Diagnosis and Treatment of Neuroblastoma* ◙

Adam Petraglia, Rhodes College; Elizabeth Butch, Scott Snyder, Department of Radiological Sciences, St. Jude Children's Research Hospital

Faculty Sponsor: Ann Viano, Department of Physics

Neuroblastoma is an early childhood cancer with an average age at diagnosis of 18 months. In 70% of cases, neuroblastoma is not detected before disease has spread to multiple sites. Currently, the only effective method to assess tumor response to therapy is the use of both structural and functional imaging with a radioactive drug (radiotracer) injected intravenously into the patient. Neuroblastoma imaging currently relies on *meta*-iodobenzylguanidine ([^{123}I]MIBG) using SPECT-CT as the standard imaging method. However, [^{123}I]MIBG results in poor image resolution, fails to quantify tumor uptake, and remains in the bloodstream long after injection, thus delaying imaging and prompting safety concerns. In response to this issue, using novel chemistry, 6-[^{18}F]fluorodopamine (^{18}F-DA) has been developed as a promising radiotracer due to its high specific activity, shorter half-life, faster clearance, and its usage with advanced positron emission tomography (PET) imaging methods. Evaluating ^{18}F-DA *in vitro* and in animal models is expected to provide improved detection of metastases and allow for the quantification of uptake needed to more adequately treat and diagnose those children with neuroblastoma.

 # 15 *The impact of alcohol consumption on neurocognitive dysfunction and psychological distress in adult survivors of childhood cancer* ◙

Brooke Bierdz, Rhodes College; Tara Brinkman, Department of Epidemiology and Cancer Control, St. Jude Children's Research Hospital

Faculty Sponsor: Kim Gerecke, Department of Psychology

Survivors of pediatric onset cancer are at-risk for neurocognitive problems following exposure to cancer-directed therapies. Heavy alcohol consumption is associated with neurocognitive dysfunction and distress in the general population; however, the contribution of alcohol consumption to these outcomes in survivors of childhood cancer is unknown. Participants included 3,806 adult survivors of childhood cancer (54% female; mean[sd] current age = 27[6] years; time since diagnosis = 25[4] years) who completed measures of alcohol use, neurocognitive function and psychological distress. Multivariable regression models were used with risk ratios (RR) and 95% confidence intervals (CIs) reported. After adjustment for sex and cranial radiation therapy (CRT), younger age at drinking initiation (i.e. <18 years vs. >18 years) was associated with impaired working memory (RR=1.31, 95% CI, 1.09-1.56). Stratification by sex revealed that this association was only significant among females (RR=1.38, 95% CI, 1.11-1.73). Heavy/risky drinking was not significantly associated with neurocognitive impairment beyond the contribution of CRT. Younger age at drinking initiation was associated with increased risk of anxiety (RR=1.58, 95% CI, 1.22-2.03), though chronic alcohol consumption was not. Results suggest a specific contribution of younger age at drinking initiation, beyond traditional treatment risk-factors, to neurocognitive and psychological outcomes in survivors of childhood cancer.

Natural Sciences

 # 16 *Monitoring thermoregulation in captive polar bears (Ursus maritimus) at the Memphis Zoo*

Alyssa Tews, Katrina Knott, Memphis Zoo

Faculty Sponsor: Sarah Boyle, Department of Biology

Polar bears are evolutionarily adapted for the Arctic biome, but captive bears often live in unnaturally hot climates and need methods to lose excess heat. The objective of this study was to determine whether polar bears modify their body posture in response to ambient temperature (Ta). An ethogram was developed to determine which body postures were most frequently observed and how these behaviors correlated to: sex, activity level, and sun exposure. Camera observations via scan sampling at 2 minute intervals were collected from September to October 2014. Our data showed that Haley rested more frequently (0.60) than Payton and that she spent majority of her observed time indoors (0.79). In contrast, Payton showed more active behaviors (0.83) and spent more than half (0.59) of his observed time outdoors. Overall, our study revealed how captive bears monitor their levels of thermoregulation by activity and sun exposure levels.

 # 17 *Outside Spatial Movement and Social Behavioral Observations of African Elephants (Loxodonta africana) in Captivity*

Conner Bradley, Yoonkeong Chi, Annie Giarla, Maraia Tremarelli Faculty Sponsor: Sarah Boyle, Department of Biology

Faculty Sponsor: Sarah Boyle, Department of Biology

Female elephants are social and tend to remain in the group that has a matriarch system. Matriarchs maintain the social dynamic of the group. At the Memphis Zoo, there are three non-related, female African elephants, Ty is the matriarch of the group and she mediates the relationship between Asali 29 years old) and Gina (32 years old). The goals of this project are to quantify agonistic behavior and physical interactions that occur between the three elephants to quantify the social interactions and dynamics among the three elephants. We collected behavioral and spatial data using scan sampling at 2-minute intervals. We then determined an activity budget for each elephant and quantified the proportion of time each elephant engaged in social behavior. We then examined the spatial component by looking at the grid number for each animal at each interval and determined the distance between each of three elephants at each interval. The findings from our study are important for quantifying the social relationship between Gina and Asali and determining in the future how this relationship may change as Tyranza ages. When Tyranza passes away, the social dynamic may shift between Asali and Gina.

 # 18 *Mapping and Analyzing Costa Rica's Current and Potential Protected Areas*

Amanda Fuller

Faculty Sponsor: Michael Collins, Department of Biology

While Costa Rica contributes only 0.03% to earth's total surface, it accounts for almost 6% of the world's biodiversity. In the wake of the global population increase and shift to urban development, Costa Rica is no exception. Deforestation threatens Costa Rica's high endemism and biodiversity. About 25.6% of Costa Rica, located in the middle of the Mesoamerica biodiversity hotspot, is designated as protected. While the protected areas of Costa Rica span the entire country, most are small and secluded. Edge effects and the equilibrium theory of island biogeography suggest that the shape, area, and distance from other protected areas strongly influence the biodiversity expected to occur in these protected areas. The purpose of this project is to use ArcGIS 10.2 technology to locate Costa Rica's protected areas and analyze where they overlap with high biodiversity. From this information, edge effects and the equilibrium theory of island biogeography can be jointly applied to determine which sites are most appropriate for future protected area locations in order to maximize and evenly distribute the protection of Costa Rica's biodiversity.

 # 19 *Disease ecology: Avian haemosporidian prevalence and its relationship to host life history* ◙

Emma Jackson, Mitch Trychta, John Selman, Michael Collins

Faculty Sponsor: Michael Collins, Department of Biology

Host fitness, population size, and behavior can be influenced by parasites and therefore influence the dynamics of ecological communities. Dipteran insects transmit haemosporidian parasites, common avian blood parasites, of the genera Plasmodium and Haemoproteus. In order to understand the relationship between blood parasites and the local bird community, we analyzed blood samples from 295 individuals of 36 bird species that were sampled from five habitats in west Tennessee at Ames Plantation. Our aim is to examine individual- and species-level traits associated with increased prevalence of avian malaria. We extracted DNA from blood samples and used PCR to amplify a section of the parasite mitochondrial cytochrome b gene to detect infections. Samples found positive for infection were then sequenced for lineage identification. We found 126 individuals of 27 species to be infected with haemosporidian parasites (overall prevalence of 43%). We identified 20 genetic lineages including 12 in the genus Haemoproteus and 8 in Plasmodium. Fifteen percent of infected individuals harbored more than one parasite lineage. Infection status did not vary with habitat or with any individual-level trait (age; sex; or body condition, a measure of health). Across species, total infection prevalence increased with abundance and was also lower in species that forage only on the ground. Total prevalence and prevalence of Plasmodium decreased with annual survival. Prevalence was unrelated to species mass and nest height. Statistical models did not converge for nest type, indicating insufficient sample size. Our research demonstrates that this complex parasite-host system includes both specialist and generalist parasite lineages, host species vary in prevalence and richness of their haemosporidian parasites, and prevalence varies across species in relation to certain host traits. We plan to sample birds again in 2015 to increase sample sizes and to examine temporal variation in this system.

 # 20 *The Environmental Impact On Crayfish Dominance*
Kelsea Lewis, Jonathan Chu, Kyanna Young
Faculty Sponsor: Michael Collins, Department of Biology
The purpose for this experiment is to determine if particular types of terrain affect the dominance and aggressiveness of male crayfish. We predicted that there would be more bouts between crayfish pairs on surfaces with smaller particles than between crayfish on larger ones. We randomly selected pairs from a set of eight male crayfish and placed them in different small tanks containing sand, gravel, large rocks, or marbles. After giving the crayfish pairs a minute to settle in their varying environments, we measured how many bouts between them occurred in four minutes. When the experiment was completed, it was determined that there was no direct correlation between how many bouts that happened between each pair of crayfish and what terrain they were on.

 # 21 *Investigating the interaction between the anti-epileptic drug gabapentin and an A-type voltage-gated potassium channel.*
Nathan Sharfman, Darren Jr. Barrow
Faculty Sponsor: Kelly Dougherty, Department of Biology
Voltage-gated potassium channels (Kv) of the Kv4 subfamily mediate transient, or A-type, potassium currents (IA) that regulate electrical signaling and somatodendritic integration. Specifically, IA attenuates the back-propagation of action potentials, and contributes to frequency-dependent action potential broadening. One member of the Kv4 channel subfamily, Kv4.3, is prominently expressed in hippocampal interneurons, which limit the generation and spread of seizures in the medial temporal lobe. Given the role that Kv4.3 channels play in regulating the hippocampal excitability, we sought to investigate potential interactions between Kv4.3 channels and the common anti-epileptic drug (AED) gabapentin. Kv4.3 channels were expressed in Xenopus laevis oocytes, and Kv4.3-mediated currents were elicited using a two-electrode voltage clamp. Control experiments demonstrated that a high potassium solution (96 mM K+) produced a predictable change in the current–voltage (I–V) relationship, and that a 0.01% dimethyl sulfoxide (DMSO) solution failed to significantly alter the I–V relationship. Furthermore, we did not observe any change in the Kv4.3 channel I–V relationship or the steady-state inactivation curve in the presence of 100 µM gabapentin. These observations are consistent with previous reports, and serve as negative controls for future experiments investigating the interaction between voltage-gated ion channels and AEDs.

 # 22 *Investigating TSC-dependent Autism in Drosophila* ◙
Rajiv Heda, Rhodes College; Dave Bridges, Department of Physiology, Erika Yates, University of Tennessee Health Sciences Center
Faculty Sponsor: Jonathan Fitz Gerald, Department of Biology
Tuberous sclerosis (TSC) is an autosomal dominant genetic disorder affecting approximately 1/6000 people The immediate symptoms of TSC are growths in the multiple tissues including the heart, kidney, lungs, skin, and brain. Approximately 25-60% of the patients are also diagnosed with autism. The genes mutated in TSC are TSC1 and TSC2. These genes regulate a nutrient signaling pathway called mTORC1. mTORC1 regulates autophagy, metabolism, and cell growth. When TSC is mutated, one or more of these three regulatory pathways may lead to autism. Our aim is to isolate these three pathways using a Drosophila melanogaster model. Fruit flies will be placed in enclosed triangles and their activities will be monitored in relation to the two spheres of autism, repetitive movements and social spacing. We will use this system to test whether TSC mutant flies exhibit autism-like behaviors and test regions of the fly brain associated with autism-like behaviors. The aim of this research will provide a molecular basis of TSC-dependent phenotypic changes in a genetically tractable model system. We have shown that TSC1 knockdown flies exhibit pronounced social spacing, consistent with autism-like behaviors. We verified these knockdowns using real-time PCR to determine transcript levels of TSC1 in flies that have the gene knockdown versus wild-type flies. These studies help to establish fruit flies as a useful model system for studying TSC-related autism.

 # 23 *Visualization and deletion of a gene governing cell wall integrity in Aspergillus nidulans* ◙
Ben Haugen, Jenny Loome
Faculty Sponsor: Terry Hill, Department of Biology
Previous work with Aspergillus nidulans identified several strains exhibiting hypersensitivity to Calcofluor-white (CFW), which binds to fungal cell walls and weakens their integrity (Hill et al., 2006). One such strain, designated calF7, was complemented in earlier work by a library plasmid containing wild type gene AN2880. In the work reported here, we visualized the subcellular localization of the protein encoded by this gene by creating a GFP chimeric protein. Using live-cell fluorescence microscopy, we showed that the protein produced by AN2880

localizes in the hyphal tip-in the Spitzenkörper. This organelle plays essential roles in fungal cell growth. We also deleted gene AN2880 by replacing the coding region with the Aspergillus fumigatus riboB gene. Transformed strains were tested for ability to grow in the presence of CFW, demonstrating that absence of a working copy of the AN2880 gene causes CFW hypersensitivity. Hyphal growth in the absence of CFW, however, appeared normal. Thus, our observations support a role for the Spitzenkörper in regulating cell wall integrity, in addition to its traditional role in hyphal growth. Work is underway to generate an RFP (Red Fluorescent Protein) tagged version of AN2880, as well as to regulate expression of the gene using an AlcA promoter.

 # 24 *A novel gene shows characteristics of myosin activity in Aspergillus nidulans*
Brian Lenny
Faculty Sponsor: Terry Hill, Department of Biology
Myosin is a very important protein in eukaryotic cells. It is involved in actin-based motility and has various functions in the cell, such as vesicle transport, cell division, and cell motility. Myosin's wide range of functions in the cell can be attributed to the many different types of classes of myosin found in the cell. In filamentous fungi, such as Aspergillus nidulans, myosins of classes I, II, and V have been identified and studied. However, we have found an additional gene not yet studied in this organism, which is reported to have sequence similarity to myosin heavy chain. In order to further investigate the role of this gene (known as AN1156) we have inserted the gene encoding GFP (green fluorescent protein) into the genome in such a way that the normal gene product of AN1156 will carry a fluorescent tag at its C-terminus. Results from this GFP-tag show localization of the AN1156 gene product to small cytoplasmic particles of the cell, which exhibit rapid movement. This is consistent with the activities of certain myosin-type proteins. Currently, we are attempting to replace the promoter of this gene with an AlcA promoter. This will allow us to alter the expression of this gene to study the effects in A. nidulans.

 # 25 *Serotonin activity in the male brown anole (Anolis sagrei) after social behavior encounters* ◙
Alexis Smith, Jake Hartline
Faculty Sponsor: David Kabelik, Department of Biology
Presently, the role of the neurotransmitter serotonin (5-HT) in social behavior regulation is not fully understood, although it has been shown to have an inhibitory effect on aggression in mammals and reptiles. We investigated correlations between 5-HT activity and sexual and aggressive behavior in the brown anole (Anolis sagrei). First, adult male lizards were exposed to different social environments (aggressive encounter, courtship encounter, or control) and their behaviors were recorded. Next, 5-HT and the immediate early gene product Fos, an indirect marker of neural activity, were visualized within five midbrain and hindbrain regions. Preliminary results show a suppression of 5-HT colocalization with Fos following both sexual and aggressive encounters, suggesting that these neuron populations were less active during social encounters than in control conditions. Further analysis of these data will contribute to a better understanding of the role of 5-HT in the brain-behavior relationship.

 # 26 *Neural populations and baseline neural activity associated with bold/shy behavioral continuum in relevant brain regions of the male green anole (Anolis carolinensis)* ◙
Jake Hartline, Shelley Choudhury
Faculty Sponsor: David Kabelik, Department of Biology
In order to better understand the neural mechanisms behind individual differences in social behavior, we assessed where individual male green anoles (Anolis carolinensis) fell on the bold/shy continuum based on the outcomes of aggressive behavioral interactions with other males and sexual interactions with conspecific females. A subsequent neural analysis was divided into two parts. First, presence of vasotocin and mesotocin-immunoreactive cells, as well as cells colocalizing both neuropeptides, was analyzed in the paraventricular and supraoptic nuclei. While mesotocin-vasotocin colocalization has been observed in water-deprived mammals, little is known about the role of these colocalized neurons in social behavior. Secondly, we examined general neural activity within brain regions commonly associated with social behavior (preoptic area, striatum, nucleus accumbens, and lateral and medial septums) using immunohistochemical detection of Fos, an immediate early gene product indicative of recent neural activity. A detailed map of behaviorally relevant neural populations and activation throughout the brain would facilitate a better understanding of the behavior-brain relationship.

 # 27 *Activation of DNA Damage Response checkpoint causes pre-anaphase cell cycle arrest in KP1019 dependent manner in S. cerevisiae.* ◙

Eliot Blatt

Faculty Sponsor: Mary Miller, Department of Biology

Cell cycle regulation is integral for proper cell replication, division, and DNA repair. Many antitumor drugs cause DNA damage, which results in cell cycle delay or arrest, allowing for repair of these DNA lesions. Similarly, the ruthenium-based antitumor drug trans-[tetrachlorobis (1H-indazole) ruthenate (III)] (KP1019) has been shown to induce mutations and cell cycle arrest in Saccharomyces cerevisiae. Using a transcriptomic approach, we confirm that KP1019 induces the DNA damage response (DDR), by showing that the checkpoint kinase Dun1's presence is required for KP1019 to activate expression of Hug1, the DDR target. We see a cell cycle delay dependent on KP1019, as measured by an accumulation of Pds1 (securin), an increase in large budded cells, and 2C DNA content. Notably, we find that a RAD9 deletion blocks drug-dependent changes in the cell cycle. This indicates a link between KP1019-induced phenotypes and the DDR. KP1019-treated yeast arrest in G2/M and display an abnormal nuclear position. This morphology is DYN1-dependent and correlates with misaligned spindles. This, consistent with the proposed model that KP1019 induces double-strand breaks when repairing inter-strand DNA cross-links. We also show that KP1019 establishes an environment that allows cells to respond to DNA damage via cytoplasmic and nuclear events.

 # 28 *Physical interactions between Protein kinase C and the formin SepA at hyphal tips and septation sites highlight roles in cell wall synthesis of Aspergillus nidulans.*

Lance Myers, Z. O. Atiq

Faculty Sponsor: Loretta Jackson-Hayes, Department of Chemistry

Septum formation in fungi involves assembly of a contractile actomyosin ring at the septation site. It has been previously reported that the formin SepA catalyzes formation of actin cables and localizes to areas of cell wall synthesis, namely hyphal tips and septation sites. As septum construction is initiated, protein kinase C (PkcA) also appears at septation sites and dissipates once septa are complete. PkcA is reported here to colocalize with SepA at hyphal tips and septa. In a SepA1 mutant strain, PkcA localizes to hyphal tips but not septation sites. Overexpression of PkcA in the SepA1 mutant strain does not complement hypersensitivity to the cell wall compromising agent calcofluor white. In order to investigate potential SepA and PkcA physical interactions at tips and septa, we used bimolecular fluorescence complementation (BiFC). We designed SepA::YFPN and PkcA::YFPC chimeras, which were expressed in our model fungus, Aspergillus nidulans. Here we show SepA and PkcA physically interact at hyphal tips and septation sites. We propose a signal transduction pathway for cell wall synthesis involving SepA and PkcA. This study can shed new light on the mechanisms of hyphal development and stress reponse in filamentous fungi.

 # 29 *Functional interactions between PkcA and candidate proteins barA, actA, and rho4 in Aspergillus nidulans*

Matthew Cannavo, Elisabet Olsen

Faculty Sponsor: Loretta Jackson-Hayes, Department of Chemistry

Fungal cell wall synthesis and response to extracellular signals is regulated by the cell wall integrity (CWI) pathway. While the CWI pathway is not fully mapped, protein kinase C (PkcA) has been shown to be essential in this pathway. Through a screening of candidate strains with mutated proteins, we identified three strains that are hypersensitive to the chitin-binding agent calcofluor white (CFW). The three strains carry mutations in the genes encoding barA, actA, and rho4. BarA is an acyl-CoA-dependent ceramide synthase, actA is actin, and rho4 is a rho-like GTPase. Rho4 localizes to septa, while actA localizes to both septa and hyphal tips. BarA localization has not been reported, however it has been shown to have a significant role in cell wall morphogenesis. PkcA also localizes to both septa and hyphal tips, and is essential to cell wall morphogenesis. Thus, we believe that these proteins may functionally interact with PkcA in the CWI pathway of Aspergillus nidulans, our model organism. Here we report potential functional interactions of these proteins with PkcA determined by assessing the ability of overexpressed PkcA to complement the CFW hypersensitive phenotype in the mutant strains.

 # 30 *Synthesis of a Natural Substrate Analogue as a Possible Inhibitor of LpxC in Gram-Negative Bacteria*

Gene Lamanilao

Faculty Sponsor: Larryn Peterson, Department of Chemistry

Treatment of Gram-negative bacterial infections is limited due to the unique structure of the outer bacterial membrane. This membrane includes a lipopolysaccharide (LPS) layer, an endotoxin that when released could result

in septic shock. An essential component of LPS is lipid A; the first committed step in its biosynthetic pathway is catalyzed by the enzyme LpxC. Inhibition of lipid A synthesis compromises the structural integrity of LPS, ultimately repressing bacterial growth. Thus, investigating the active site of LpxC as a possible site of inhibition through the synthesis of natural substrate analogues is the central aim of this research. The natural substrate analogues include features that interact with corresponding elements of the LpxC active site: a uracil-containing nucleoside and a zinc-binding motif. Five natural substrate analogues have been designed, all of which maintain various structural features in order to study the interactions necessary for optimal inhibitory activity. Based on computational modeling, an analogue containing an acyclic nucleoside coupled to an amino acid-containing hydroxamic acid via an ether linkage was determined to have the highest interaction activity. The progress toward the synthesis of this particular analogue will be discussed.

 # 31 *World Economic History: Estimating the Economic Power of Countries*
Shu Yang
Faculty Sponsor: Eric Gottlieb, Department of Mathematics & Computer Sciences
Particle filtering is a general Monte Carlo method for performing inference in state-space models, where the state of a system evolves in time and information about the state is obtained via noisy measurements made at each time step. It is widely used to analyze time series models with non-linear patterns. In this program, four steps of particle filtering-Generation, Translation, Update and Resampling- will be shown in details to indicate how to process a particle filter in Mathematica. The model that is presented here is the world economic center of gravity, which is the weighted mean of world GDP. As the result, the location of the future GDP centers will be predicted. This project is a sequential work of my project "World Economic History: Tracing the Economic Power of Countries". The main point is to maximize the use of Mathematica throughout the process.

 # 32 *The q-Digamma Function*
Blake Wilkerson, Shubho Banerjee
Faculty Sponsor: Shubho Banerjee, Department of Physics
We analyze the q-analog of the digamma function around q=1. At q=1, this function reduces to the regular digamma function, which is the logarithmic derivative of the gamma function. The gamma and digamma functions are fundamental to research in number theory and other branches of mathematics. Our results provide alternate ways to evaluate the q-analogs of these functions close to q=1 that avoid calculating infinite sums/products that display slow logarithmic convergence.

 # 33 *Analyzing Ultraviolet Absorption Lines of Quasars with the Hubble Space Telescope* ◙
Anthony To
Faculty Sponsor: David Rupke, Department of Physics
Quasars are massive black holes that can emit copious amounts of light in many regions of the electromagnetic spectrum. With a focus on quasars that emit in the ultraviolet spectrum, I perform transformations and calculations on data from the Hubble Space Telescope to procure values for covering factor, which describes the amount of light blocked, and optical depth, which describes the transparency of the blockage.

Social Sciences

 # 34 *Yik Yak Investigation*
Becka Hampton, Stephanie Coma, Alden Knipe, Adil Khan
Faculty Sponsor: Dee Birnbaum, Department of Commerce & Business
Our study examined an incident that occurred in the Fall of 2014, in which a series of controversial posts were made expressing racism, homophobia, and sexism on the social media application, Yik Yak. Two weeks after the comments were made on the social media app, we compiled a survey to send to Rhodes' faculty and staff comprised of a combination of nine short answer and multiple choice questions. The questions were intended to gauge their knowledge of posts made on Yik Yak and the overall climate on campus. We used this survey, as well as information gathered from Yik Yak, students, and one-on-one meetings with members of the Rhodes community to determine the differences between Rhodes employees' and students' perceptions of campus climate.

 # 35 *The definition of success*
Shuo Yan
Faculty Sponsor: Dee Birnbaum, Department of Commerce & Business
Inspired by the three mobility theories in Tausky's organized inequality chapter, which suggests that getting ahead may mean quite different things to different people, and furthermore suggests that a person sees himself or herself the way he or she thinks others see him or her, I realized that people's definitions of success are not always the same. Therefore, I am going to explore the relationship between an individual's definition of success, and why he or she defines his or her success in a certain way and his or her mobility toward success. To do this, I am conducting research with Rhodes Students.

 # 36 *Can School Choice Save the Public School System?*
Jack McCleskey
Faculty Sponsor: Zachary Casey, Educational Studies Program
Many scholars and contemporary critics share the belief that the present system of education in the US is in a state of crisis. The cost of public education continues to rise, yet graduation rates and standardized test scores continue to decline. While many believe that an increase in funding is needed to save this system system, others advocate the importance of parental school choice. Parents know what is best for their children, and they are afforded the opportunity to make choices every single day that directly influence their children's lives. When it comes to educating their child, however, parents (especially those of color and those living at or near the poverty line) historically find that they have no choice at all aside from their local public school. Even if these parents believe that the school is failing at providing a quality education and safe environment for their child, they are still forced to keep their child in that assigned school. This paper looks at how school choice, through the use of charter schools and vouchers, can be the solution to our country's failing school public school system, and help ensure that all children are provided with a quality education.

 # 37 *A Happy Marriage: How Federal and Local Governments Can Work Together to Further Education*
Joseph Korth
Faculty Sponsor: Zachary Casey, Educational Studies Program
The battle between local and federal control of education continues to be a contentious topic in the political spectrum. Citizens, as well as the schools themselves have been caught up in this battle. On one hand some see benefits in the schools having local control and autonomy, on the other is a federal government that can hold schools accountable and enforce higher expectations. Also, adding to the complexity of the debate, local governments may not see the benefits of some aspects of curriculum, because they do not view problems on a national scale (e.g. a local government may not have made science a priority during the space race). My research offers a way that these two types of educational control can come to a compromise that would benefit the most citizens. It will show the positive aspects of both, that can be adopted for use in legislation, while also highlighting the negative features that should be eliminated. These two types of thinking can be happily married, and together can actually become a stronger policy towards education.

 # 38 *Early Intervention Education and the Whole Child: Preparing every child to learn*
Mollie Newbern, Dr. Z. Casey, Department of Psychology and Dr. N. Person, Department of Psychology
Faculty Sponsor: Zachary Casey, Educational Studies Program
Early intervention education provides programs for children as young as 2 years of age with support and education programs in order to instill healthy development. The education system in America is constantly changing in order to bring test scores up and to compete with the educational attainment of other countries. However, the problem with our education system is that children are going to school not ready to learn. Most "failing" schools are in low socioeconomic neighborhoods where it is difficult to provide proper nutrition, healthy environments, and parental support for children. Students are continually coming to school hungry preventing them from learning to their maximum potential. Beginning in 1965 Head Start, later followed by the Child Care Development Block Grant have started the increase in early intervention programs. My research explores how the "Whole Child" model gives children the opportunity to be mentally, physically, and emotionally stable at school and to translate better living at home (Learning and Health, 2015). Combining these two approaches, young children could be well equipped to learn later in education. My research adds to scholarship in both education and health policy, in the hope that such work will allow a deeper understanding of how to create the most conducive learning environment(s) for children.

 # 39 *The Disappearing Public School*
Rebekah Barr
Faculty Sponsor: Zachary Casey, Education Studies Program
Charter schools, private schools, magnet schools, and online programs are replacing the necessary 'traditional neighborhood public school'. Schools centralize communities and decrease neighborhood crime. Each development of a for profit or private institution takes away a piece of the community and neighborhood-feel. My paper focuses on the recent and rapid development of schools that don't operate under the 'one size fits all' educational model, and finds that though these schools are beneficial to certain types of students, the disappearing public school model is also taking communities with it. Particularly in urban communities, the maintenance of the public school as a neighborhood pillar is vital to neighborhood safety, personal relationships, and heritage. Starting with the public school, only then can a community and thus students be positively impacted from the outside of the school walls in. Through an examination of relevant research, primary, and secondary sources, this paper argues for the decrease of public support for private-public, for-profit, online educational management organizations and for the cyber-schools they've created to be replaced with robust, local, and neighborhood specific school buildings.

 # 40 *A visual content analysis of stigmatizing and stigma-challenging portrayals of mental patients in Life and Look magazines*
Madison Tallant
Faculty Sponsor: Jonathan Cook, Department of Psychology
Media portrayals of mental illness frequently contain stigmatizing images that support stereotypes about the mentally ill. While stigma-challenging portrayals of mental illness do exist they often fail to correct the misinformation provided by the stigmatizing portrayals. The present study examined the extent to which contemporary stigmatizing and stigma-challenging themes are present in historical media portrayals of institutionalized mental patients. A visual content analysis was conducted on 40 articles containing 350 images featuring institutionalized mental patients from Life and Look magazines. I hypothesized that portrayals of mental patients would differ between magazines and over time (pre- vs. post-antipsychotic eras). Look magazine had significantly more stigma-challenging visual content than Life. No significant differences were found in overall thematic content over time, but subthemes of blame and ability were significantly different in the predicted directions during the post-antipsychotic era. Findings suggest that stigmatizing portrayals found in modern media content can be identified in historical media portrayals as early as the late 1930s. Implications and suggestions for future research are discussed.

 # 41 *An Examination of Microaggressions Among Women at Rhodes*
Iris Mosah
Faculty Sponsor: Anita Davis, Department of Psychology
Much of the literature examining conflict in racial and ethnic interactions has focused on interracial dynamics, ignoring the fact that prejudices and tensions also exist among people of the same race or ethnicity (e.g., Pyke, 2010; Smith & Moore, 2014; Thompson & Keith, 2001). These prejudices and tensions often manifest themselves in microaggressions, which are brief, everyday exchanges that send denigrating messages to certain individuals because of their group membership (Sue, 2008). The purpose of this study was to investigate what factors influence how women of color rate the closeness of their relationships with other women of color as compared to their relationships with White women at a predominantly White, liberal arts college. Additionally, the study examined the types of microaggressions experienced with both groups of women. These findings enrich our understanding of the experiences of women of color on predominantly White, liberal arts college campuses.

 # 42 *Identification of Candidate Genes that Underlie the QTL on Chromosome 1 that Mediates Genetic Differences in STress-Ethanol Interactions* ◙
Jessica A. Baker, Rhodes College; Melloni N. Cook, Department of Psychology, University of Memphis; Scott A. Heldt, Kristin M. Hamre, Department of Anatomy and Neurobiology, University of Tennessee Health Science Center; Robert W. Williams, Department of Genetics, Genomics and Informatics, University of Tennessee Health Science Center; Lu Lu, Department of Genetics, Genomics and Informatics, University of Tennessee Health Science Center & Jiangsu Key Laboratory of Neuroregeneration, Nantong University
Faculty Sponsor: Rebecca Klatzkin, Department of Psychology
Alcoholism, stress and anxiety are strongly interacting heritable, polygenetic traits. In a previous study, a quantitative trait locus (QTL) was identified on murine chromosome (Chr) 1 at 23.0–31.5 Mb that modulates genetic

differences in the effects of ethanol on anxiety-related phenotypes (Ziebarth et al., 2012). The goal of the present study was to further evaluate these phenotypes focusing on the identification of candidate genes within the QTL region using newly available resources. Anxiety-like behavior was evaluated using an elevated zero maze following saline or ethanol injections (1.8 g/kg) in C57BL/6J, DBA/2J, and 72 BXD strains. A significant effects of strain and treatment and their interaction on anxiety was detected. The Chr 1 QTL is specific to the ethanol-treated cohort. Candidate genes in this locus were evaluated using bioinformatic criteria, including sequence polymorphisms, significant expression in relevant brain regions, correlation with the phenotype, and expression QTLs. Two genes, Ptp4a1 and Phf3, met each of our bioinformatic criteria. Interestingly, Ptp4a1 and Phf3 have been nominated as candidate genes for alcohol dependence in a human GWAS. These findings support the hypothesis that variants in one or both of these genes modulates heritable differences in the effects of ethanol on anxiety-related behaviors.

 # 43 *Examining the Contributions of Encoding Variability and Desirable Difficulty to the Benefits of Repetition*
Aubrey Schonhoff
Faculty Sponsor: Geoffrey Maddox, Department of Psychology
The spacing effect describes improved memory performance for material repeatedly studied across time compared to memory performance for material continuously studied. The encoding variability account assumes that spacing is associated with additional contextual cues that facilitate retrieval. The study-phase retrieval account suggests that retrieval of an item's first presentation is necessary for enhanced memory. This memory will increase with effort of retrieval (i.e., desirable difficulty). In the current study, participants studied a list of words. Items were presented once or twice separated by one (Lag 1) or five (Lag 5) other items. This represented encoding variability with longer spacing yielding more variability. Participants were asked to detect repeated items. Reaction times for judgments signified the difficulty of reminding where longer latencies reflected greater effort. Results showed increased recognition for Lag 5 compared to Lag 1 items. To determine the contributions of the two accounts, performance was analyzed separately for items types as a function of response latency. Moreover, response latency was binned, and lag for each bin was analyzed to assess encoding variability's influence when reminding difficulty was held constant. Results suggest that encoding variability provides a unique contribution to the benefit of spaced study exceeding the difficulty of reminding.

 # 44 *Understanding the Influence of Individual Differences in Cognitive Abilities on the Spacing Effect*
DeSonya Tyms, Rachel Giacobbe, Jane Joyner, Ernie Valente
Faculty Sponsor: Geoffrey Maddox, Department of Psychology
The spacing effect reflects a benefit in long term memory when material is repeatedly studied with intervening material or time as opposed to when studied in mass. Recent research has examined an inverted u-shaped relationship between lag time and memory in which lag time increases memory performance on a free recall test up until the time when participants reach their optimal lag and study phase retrieval fails . After this point memory performance decreases. The current study examined 1) the inverted u-shaped relationship between lag time and memory performance and 2) individual differences in multiple cognitive abilities (e.g., cognitive control) that may affect a participant's optimal lag time and overall memory performance. Participants studied a list containing 56 critical words which were repeated following one of seven lags. Following the learning phase, participants completed a free recall task in which memory performance was assessed. Results from this study will further our understanding of the relationship between individual differences and optimal lag intervals.

 # 45 *Optimizing memory performance: How individual differences influence the Spacing Effect following Short and Long Retention Intervals*
Emily Davidson, Anna Freymeyer, Bryn Terry, Skylar Menist
Faculty Sponsor: Geoffrey Maddox, Department of Psychology
Long-term memory is typically enhanced when study events are separated in time rather than massed in time (i.e., the spacing effect). Moreover, evidence suggests that the benefit of spacing increases as the time between learning and final test increases (i.e., a Spacing Interval x Retention Interval interaction). The current study examined the optimal level of spacing between repetitions of an item that maximized memory performance across individuals. Moreover, we examined the role of various individual differences that may contribute to differences in optimal spacing intervals across participants when final testing occurred following short (60 second) and long (20 minute) retention intervals. The results and discussion explain how individual difference measures and optimal lag intervals relate to and influence memory across participants.

 # 46 *The Roles of Self-esteem and Motivation in Modulating the Lag Effect*
Emily Doherty, Kat Millis, Andrew Smith, Cailey Wagner
Faculty Sponsor: Geoffrey Maddox, Department of Psychology
The lag effect refers to the benefit observed in long-term memory for material repeatedly studied with intervening material compared to material studied in massed fashion. Recent evidence suggests that the optimal amount of spacing between repetitions may differ across individuals. The current study examined the effect of lag on a final memory test. Moreover, individual differences (e.g., self-esteem, motivation) were assessed in order to evaluate possible explanations as to why different people have different optimal spacing intervals. Results and discussion examine the importance of individual difference's in self-esteem and motivation as modulating factors of optimal lag interval. This relationship should be considered in optimizing the benefits of repetition learning.

 # 47 *Training improves participant-implemented equal spaced and expanded retrieval practice*
Rahul Peravali, Jessica Gatewood
Faculty Sponsor: Geoffrey Maddox, Department of Psychology
The benefit of spaced retrieval over massed retrieval (i.e., cramming) is well documented (e.g., Delaney, Verkoeijen, & Spirgel, 2010). However, little work has examined how participants naturally space their retrieval and the extent to which they can implement specific forms of spaced retrieval. The current study examined the extent to which training improves the implementation of equal spaced and expanded retrieval schedules and influences reading comprehension. Using a paradigm similar to the paradigm used by Maddox and Balota (2012), participants received two training trials and one critical trial for equal spaced and expanded retrieval. At the end of the experimental session, participants completed a final test over all of the associations learned in the task. Results revealed improved implementation of experimenter-instructed strategies with training. Moreover, a benefit in acquisition of face-name associations was observed with expanded retrieval over equal spaced retrieval but similar levels of memory were observed across strategies following a retention interval (i.e., 50 minutes).

 # 48 *Examining the Influence of Task Difficulty on Participant Choices to Mass or Space Retrieval Practice*
Zachary Kauffman, Claira Winget
Faculty Sponsor: Geoffrey Maddox, Department of Psychology
The current study examined one factor that may influence the choice to mass or space retrieval practice. Namely, we examined how an individual's choice to repeatedly retrieve information is modulated by task difficulty (i.e., the number of to-be-learned items). The current experiment extended past research in three ways. First, participants could review a set of face-name pairs (4 vs. 12 pairs) at their own choosing. Second, the current experiment utilized retrieval practice rather than repeated study. Third, participants were allowed four tests per block. Results revealed that the order of completion of easy and difficult memory tasks influenced the number of tests taken. Completing the difficult task first led to increased testing in the easy task relative to when the easy task came first. Importantly, individuals spaced their tests to a greater extent for difficult material than easy material (c.f. Benjamin & Bird, 2006). However, retrieval of both easy and difficult material was spaced across the ongoing task (M = 3 vs. 4 minutes, respectively). These results suggest that increased flexibility and participant control of repeated retrieval practice can provide novel insights into participant beliefs regarding the efficacy of this technique.

 # 49 *Connecting the Dots: Teaching White Students about Racial Privilege and Discrimination*
Katherine Fritzlen
Faculty Sponsor: Chris Wetzel, Department of Psychology
Privilege is the unearned advantage and systematically conferred dominance based purely on one's race or membership to a group. White privilege refers to the benefits and advantages that Whites have for being white. We wanted to see if teaching White students about White privilege make students more aware of Black discrimination, privilege linked to discrimination and Whites as the perpetrators of this discrimination. We manipulated the type of game played, character roles, and affirmation and collected demographic data. We found the self-affirmation compared to other affirmation had opposite effects on the student and non-student games. We also found that participants who other-affirmed in the privileged role experienced a greater gain in their awareness of Black discrimination than those who played the non-privileged role and those who self-affirmed as a privilege player. Political orientation was negatively correlated with all variables. We discuss the implications of these findings for educating White students about racial privilege.

 # 50 *Reactions to White Privilege: Perceived Costs, Confrontation, Self-efficacy, and the Responsibility of White Privilege*

Mollie Newbern, Chris Wetzel, Department of Psychology
Faculty Sponsor: Chris Wetzel, Department of Psychology

"White Privilege" is the advantage or benefit one obtains due to their own white skin color. Most Whites do not believe or realize the benefits they have because of the color of their skin. Without being aware of White privilege, Whites may believe in reverse discrimination that they are at a disadvantage due to their race. The impact of Whites learning about white privilege was assessed in this experiment, which had participants interact with a series of race oriented scenarios. I manipulated three independent variables: player role in the simulation (privileged or non-privileged), whether or not they self-affirmed, and type of simulation (a student-oriented vs an older adult variation). My dependent variables were the Perceived Costs of White Privilege, Willingness to Confront White Privilege, Responsibility for racial inequality, and Self-Efficacy in dismantling the privilege. Results showed that the different game types effected the results of perceived costs of white privilege and self-efficacy. Further analysis showed a gender and political orientation effects within assigned role and game type.

 # 51 *Influencing attention: How emotion fucks with speech production*

Andrea Davis, Liz Giraud, Rebecca Brewster, Abby May
Faculty Sponsor: Katherine White, Department of Psychology

Past research has shown that attention plays an important role in the production of speech, and that strong emotional stimuli, such as highly arousing or socially-inappropriate (taboo) words, tend to draw attention away from speaking. However, less is known about which characteristics of emotion words engage attention to disrupt speech production. In this study, participants were asked to name a series of pictures presented one at a time on a computer screen and to ignore superimposed distractor words. Distractor words varied in two emotional characteristics: valence (negative, neutral, or positive) and arousal (lower or higher). The context in which the pictures and distractors were presented was also varied: Half of the pictures were presented in a block that contained pictures with taboo distractors and the other half did not include any taboo distractors. Statistical analyses will explore how the emotional context and the distractor emotional characteristics of valence and arousal influence picture naming, while controlling for other characteristics known to affect word retrieval (e.g., word frequency and length). Results will be discussed within theories of attention and speech production.

 # 52 *Viewer Discretion Advised: Warning Enhances Attentional Control of Emotion*

Anne Hohlt, Lisa R. Hsi, Sarah M. Koehler
Faculty Sponsor: Katherine White, Department of Psychology

The purpose of this experiment was to investigate the role of attentional control in speech production. Previous research has shown that attention is diverted from speaking when strong emotional (particularly taboo) material is unexpectedly encountered. In this experiment, participants named black-and-white pictures of common objects while attempting to ignore a taboo, negative, or neutral distractor word superimposed over each picture. Speech production was measured by the time to name each picture. We investigated whether interference from taboo and negative distractors can be reduced when participants are expecting to encounter an emotional word. Half of the trials were preceded by a color cue fixation (+) that signaled the type of distractor word (taboo, negative, neutral) that was to appear with the picture. The remaining trials were cued with a black fixation that did not indicate the type of distractor. We predict that participants will proactively engage attentional control to reduce interference from taboo and negative distractors, thus demonstrating the importance of attention in speech production.

 # 53 *The Killer Effects of Emotion on Attention During Speech Production*

Harrison Adams, Eann Malabanan, Elyse Smith, Rebecca Thompson
Faculty Sponsor: Katherine White, Department of Psychology

The purpose of this experiment was to investigate the role of emotionally distracting information on attention during speech production. Specifically, we investigated how two emotional characteristics – a word's valence and arousal – engage attention to interfere with speech production. Participants completed a picture-word interference task that required them to name target pictures that had superimposed distractor words. Distractor words ranged in valence (degree of pleasantness) and arousal (degree of excitement), as well as in lexical characteristics such as word frequency and word length. In order to determine how much variance in naming is accounted for by distractor valence and arousal, results were analyzed using a hierarchical regression that controlled for the lexical characteristics of both target pictures and distractors. We predict that naming times will be slowest when distractor

words are high arousal and negative valence. This research should lead to a better understanding of how emotional words influence the cognitive processes involved in speech production.

 # 54 *When Bad is Good: Taboo Words Improve Homophone Spelling*
Jason B. Crutcher, Sunanda S. Mattancheril,; Katherine White, Department of Psychology, Rhodes College; Danielle K. Davis, University of Florida; & Lise Abrams, Department of Psychology, University of Florida
Faculty Sponsor: Katherine White, Department of Psychology
Research on homophone spelling shows that orthographic primes (stair) increase homophone substitution errors (producing hair instead of hare) during sentence production. This experiment investigated whether the presence of taboo words can also influence homophone errors, as taboo words have been shown to interfere with speech production. Participants heard sentences over headphones and attempted to type them verbatim. Half of the sentences contained a contextually-appropriate taboo word or a neutral, non-taboo word, which was followed 1-2 words later by either an orthographic prime containing the inappropriate spelling of the target homophone or an unrelated word. Results showed that sentences containing highly taboo words reduced homophone errors compared to sentences containing neutral words. However, tabooness did not reduce susceptibility to orthographic priming, as sentences with primes increased errors relative to unrelated sentences. These findings suggest that unlike speech production, taboo words facilitate written sentence production by decreasing homophone errors, which may be a consequence of taboo words increasing attention to the overall task.

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 # 55 *Do Crickets Have a Preference between Fresh or Processed Food?*
Arianna Amini, Reggie Eskridge, Jacob Stansberry, Courtney Link
Faculty Sponsor: Laura Luque de Johnson, Department of Biology

 # 56 *The Effect of Miracle Grow on Duckweed Growth*
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Faculty Sponsor: Laura Luque de Johnson, Department of Biology

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Faculty Sponsor: Mel Durrett, Department of Biology

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Tyler Bierschenk, Ellie Fratt, Mary Passmore
Faculty Sponsor: Mel Durrett, Department of Biology

Anthropology Display

The Art of Anthropology
Faculty Sponsors: Julia Hanebrink and Ashante Reese, Department of Anthropology & Sociology
The common ground on which art and anthropology engage can be defined in terms of their observational and knowledge producing practices. Both art and anthropology rely on observational skills and varying forms of visual literacy to collect and represent data. Anthropologists represent their data mostly in written form by means of ethnographic accounts, and artists represent their findings through a variety of artistic mediums.
Furthermore, arts-informed inquiry looks towards the arts not only as a form of individual expression, but also as a key instrument in confronting current and historically significant issues. Art creates stories which tell about how people can resist inequality, challenge the dominant ideologies that support it, fight for more equal and inclusive social arrangements, and challenge an unjust status quo. Rupturing the status quo and producing alternative constructed situations enables us to interrogate hegemony and expose oppressive practices of power and domination, thus enabling new possibilities for an inclusive human community.

Students in Professor Ashante Reese's and Professor Julia Hanebrink's Introduction to Anthropology (ANSO 103) courses have created works of art that represent important social issues. The goal of this visual anthropology project is to enable the exploration of ways to visually represent and interpret stories of power, domination, resistance, and inequality on a personal level through an artistic medium.

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