

**UNDERGRADUATE RESEARCH SYMPOSIUM 2017: SESSIONS AT A GLANCE**

<b>12:45 to 1:20 pm</b>	<b>Registration:</b> Presenter check-in at 5th floor lobby												
<b>1:30 pm to 2:50 pm</b>	<p align="center"> <b>Opening Session:</b> Woodruff Auditorium  <b>Welcome:</b> John Augusto, Center for Undergraduate Research  <b>Opening Remarks:</b> Chancellor Bernadette Gray-Little  <b>Presentation of Awards:</b> ACE Talks  <b>ACE Talks:</b> Elizabeth Phillips, Karynn Glover, Billie Lubis         </p>												
Session 2	Centennial	Big 12	Pine	Jayhawk	The Jay	International	Divine 9	English	Parlors	Alderson	Regionalist	Kansas	
<b>3:00 pm to 4:00 pm</b>	Session 2A	Session 2B	Session 2C	Session 2D	Session 2E	Session 2F	Session 2G	Session 2H	Session 2I	Session 2J	Session 2K	Session 2L: Posters	
<b>4:00 pm to 4:30 pm</b>	<b>Break: Join us in the 4th floor Lobby for snacks and a chance to mingle with friends, mentors, and family.</b>												
Session 3	Centennial	Big 12	Pine	Jayhawk	The Jay	International	Divine 9	English	Parlors	Alderson		Kansas	
<b>4:30 pm to 5:30 pm</b>	Session 3A	Session 3B	Session 3C	Session 3D	Session 3E	Session 3F	Session 3G	Session 3H	Session 3I	Session 3J		Session 3L: Posters	
<b>5:30 pm to 7 pm</b>	<p align="center"> <b>Banquet:</b> Ballroom  <b>Welcome:</b> John Augusto, Center for Undergraduate Research  <b>Presentation of Awards:</b>            K. Barbara Schowen Undergraduate Research Mentor Award            Undergraduate Research Mentor Award            Outstanding Presentation Awards         </p>												

**Undergraduate Research Symposium Program**  
**Saturday, April 22, 2017**  
**University of Kansas, Kansas Union**

**12:45 – 1:20 Presenter registration (sign-in & name tags) – 5<sup>th</sup> Floor Lobby**

**1:30 – 2:50 Opening Session – Woodruff Auditorium**

**Welcome:** John Augusto, Center for Undergraduate Research

**Opening Remarks:** Chancellor Bernadette Gray-Little

**Presentation:** ACE Talk Awards

**ACE Talks:**

**1:45: Elizabeth Phillips**, The Perceptual Boundary Between Two Auditory Illusions, mentored by Michael Vitevitch & Nichol Castro

**2:05: Karynn Glover**, The relationship between motivational climate and objective performance, mentored by Mary Fry

**2:25: Billie Lubis**, X-ray testing of silicon forward pixel modules, mentored by Alice Bean

**3:00-4:00 General Session 2**

**Oral Presentations – Sessions 2A-2K:**

**Session 2A: Centennial Room (6<sup>th</sup> Floor)**

**3:00: Saran Davaajargal**, Effects of Environmental Attitudes of Managers and Employees on Environmental Management Endeavors, mentored by Dietrich Earnhart

**3:15: Eli Hymson**, Gender Disparities in Debate: How Gender Interactions Influence Subjective Competitor Evaluations, mentored by David Slusky

**3:30: Meixi Wang**, It Takes a Nation—or Many Nations: A Cross-Country Analysis of the Effects of Family and Social Factors on Program for International Student Assessment (PISA) Scores, mentored by John Keating

**3:45: Edo Saragih**, The Impact(s) of Labour Increment through Immigration towards Germany's Economic Growth since Reunification of 1990, mentored by Brian Lagotte & Steven Epstein

### **Session 2B: Big 12 Room (5<sup>th</sup> Floor)**

**3:00: Emma Anderson**, What variables predict the number of AP STEM courses that public high schools in the state of Kansas offer?, mentored by Thomas DeLuca & Steven Obenhaus

**3:15: Daniel Theisen**, The Restless Monkey: Using Conceptual Metaphor Theory to Facilitate Mindfulness Meditation, mentored by Mark Landau

**3:30: Jacob Chamberlin**, The Influence of High School Athletes' Perceptions of the Motivational Climate on Athletic Identity and Academic Endeavors, mentored by Mary Fry

**3:45: Zachary Green**, Early Steps of Alzheimer's Disease Prevention: Exploring Functional Regulation in Healthy Older Adults, mentored by David K. Johnson

### **Session 2C: Pine Room (6<sup>th</sup> Floor)**

**3:00: Shaina Stasi**, The Effect of Glottal Source Characteristics on Speech Perception, mentored by Jonathan Brumberg

**3:15: Halle Nick**, The Speech-to-Song Illusion in (simulated) Cochlear Implant Users, mentored by Michael Vitevitch

**3:30: Liran Ziegelman**, Identifying Initiation of Firing in Multiple Neuronal Populations, mentored by Rob Kass

**3:45: Katherine Rorick & Amy Baker**, Impact of Speech Rate and Masked Speech on Listener's Perception and Report of Function Words, mentored by Navin Viswanathan & Annie Olmstead

### **Session 2D: Jayhawk Room (5<sup>th</sup> Floor)**

**3:00: Kaylisa Estes**, A Case of Stigma and Mental Health within Black Female College Students: How stigma affects willingness to accept accessibility, mentored by Jenna Lyons

**3:15: Murphy Maiden**, Queering Protections: How Policies and Resource Allocations Shape Queer, Transgender, and Gender Non-Conforming Student Experiences on the University of Kansas Lawrence Campus, mentored by Sherrie Tucker

**3:30: Mara McAllister**, Where are the dads?: Examining the absence of fathers in Early Head Start Home Visiting at Project Eagle, mentored by Ivery Goldstein

**3:45: Francesca Haynes**, Asexuality and Hookup Culture, mentored by Ivery Goldstein

### **Session 2E: The Jay/Spare Room (1<sup>st</sup> Floor)**

**3:00: Tyler Gartner**, Russian Intelligence in cyberspace, 2014-2016, mentored by Brian Lagotte

**3:15: Eric Alseth**, New Pollution: The Effect of Rising Temperatures on the Rheingebiet, mentored by Lorie Vanchena

**3:30: Juliana Hacker**, Phase-out of Nuclear Energy: Good or Bad?, mentored by Lorie Vanchena

**3:45: Sophia Fortmeyer**, Mining Transparency in Zambia and the DRC, mentored by Brian Lagotte & Ebenezer Obadare

### **Session 2F: International Room (5<sup>th</sup> Floor)**

**3:00: Thomas O'Tey**, LGBT Portrayals in BioWare Video Games, mentored by Jenna Lyons

**3:15: Carla Rivas-D'Amico**, More Than You Know: Familial Support and Queer Relational Satisfaction, mentored by Jenna Lyons

**3:30: Mark Livingston**, How environmental differences affect the relationship between masculinity and violence, mentored by Jenna Lyons

**3:45: Harrison Baker**, Implicit Bias Towards LGBTQ+ Identified Individuals Through Resume Evaluation, mentored by Jenna Lyons

### **Session 2G: Divine Nine Room (6<sup>th</sup> Floor)**

**3:00: Joshua Lutz**, Government Desegregation: A Failure to Effectively Desegregate the Kansas City Missouri Schools, mentored by Jonathan Hagel

**3:15: Matthias Bryson**, St. Winefride's Well and the Preservation of Catholic Community in Early Modern England and Wales, mentored by Katherine Clark

**3:30: Paige Cook**, God Save the Tartan and the Dirty Punk: A look into how the Tartan print came to symbolize the Punk Rock movement in 1970s England, mentored by Andrew Denning

### **Session 2H: English Room (6<sup>th</sup> Floor)**

**3:00: Kareem Wall**, Do Moor Harm, Then Good: Defining Black Masculinity in Shakespeare's Othello, mentored by Jonathan Lamb & Sarah Ngoh

**3:15: McKinzey Manes**, Translations of stories from "Priče sa Jališe" by Hajim S. Davičo, mentored by Stephen M. Dickey

**3:30: Courtney Frets**, "In Times of Fading Light" (In Zeiten des abnehmenden Lichts) and the German cultural memory of the German Democratic Republic, mentored by Lorie Vanchena

**3:45: Megan Fox**, A Joke, Revolutionary, and Gillyweed Expert: Reading a Magical Gender Binary into Harry Potter Through Neville Longbottom, mentored by Giselle Anatol & Jonathan Lamb

### **Session 2I: Parlors (5<sup>th</sup> Floor)**

**3:00: Courtney Coda**, Nietzsche, Kant, and Feminist Ethics, mentored by Ivery Goldstein

**3:15: Mitchell Newton**, Foucault's Final Formulation: The World's Most Cited Scholar and the Problem of Historical Ontology, mentored by Benjamin Sax

**3:30: Abigail Fields**, Man, society, and nature: A Rousseauist reading of Émile Zola, mentored by Christine Bourgeois

**3:45: Carla Valenzuela**, An Analysis on the Role of New Technology on Human Consciousness Based on Walter J. Ong's, Orality and Literacy: The Technologizing of the World, mentored by Isidro Rivera

### **Session 2J: Alderson Auditorium (4<sup>th</sup> Floor)**

**3:00: Cecilia Villanueva**, Serum Bactericidal Activity of Animals Immunized Against *Salmonella enterica*, mentored by Wendy Picking

**3:15: Katherin Morales**, Attempt to Produce Lineages of *Caenorhabditis elegans* with Human Tau Protein in its Chromosome as an Experimental Model in the Study of Alzheimer's Disease, mentored by T. Chris Gamblin & Brian Ackley

**3:30: Ricardo Gonzalez**, Synthesis Of Cyclic Peptides and Expression of EC1 Protein To Study The Binding Affinity, mentored by Teruna J. Siahaan

**3:45: Brianna Marsh**, High plasma levels of protein-methionine sulfoxide may be indicative of Alzheimer's disease, mentored by Jakob Moskovitz

### **Session 2K: Regionalist Room (5<sup>th</sup> Floor)**

**3:00: Patrick Griffin**, Museum of Agnotology, mentored by Kapila D. Silva

**3:15: Sekou Hayes**, Dallas Pride Museum, mentored by Kapila D. Silva

**3:30: Zachary Lundgren**, The Museum of Slow Violence, mentored by Kapila D. Silva

**3:45: Stephen McEnery**, A Museum exploring historical socio-spatial injustice in Dallas, TX, mentored by Kapila D. Silva

## **Poster Presentations:**

### **Session 2L: Kansas Room (6<sup>th</sup> floor)**

**Kathryn Brewer (#1)**, Assessing the Post-Translational Modification of PvdJ Module 2 in *Pseudomonas aeruginosa*, mentored by Audrey Lamb

**Cedric Clark (#2)**, Targeting  $\beta$ -barrel Outer Membrane Proteins in the Fight Against Antibiotic Resistance, mentored by Joanna Slusky

**Cara Davis (#3)**, Structural and Functional Characterization of a *Yersinia pestis* Opine Dehydrogenase Involved in Metallophore Biosynthesis, mentored by Audrey Lamb

**Aidan Dmitriev (#4)**, Structural Analysis of RsbU Reveals Sensor Activity for Metabolic Modulation in *Chlamydia trachomatis*, mentored by P. Scott Hefty

**Kayla Wilson (#5)**, Genetic control of tissue-specific growth in the larval trachea of *Drosophila*, mentored by Robert Ward

**Sarah Schaefer (#6)**, The Development of HepG2 as a Fetal Liver Drug Metabolism Model, mentored by Michael Wang

**Siddarth Sharma & Ryan Thomas (#7)**, The Comparative Analysis of Nicaraguan Mestizo Populations, mentored by Jennifer Raff & Kristine G. Beaty

**Jeremy Lippman (#8)**, The Examination of Possible Sex-related Differences in Properties of Motor Units, mentored by Trent Herda

**Sanjay Parashar (#9)**, The Sensitivity and Specificity of SIRS for Organ Dysfunction in Patients Presenting to the KU Emergency Department with Suspected Infection, mentored by Steven Q. Simpson

**Matthew Bierbaum (#10)**, Sex Discrimination in Males of *Zaprionus indianus* by Hearing or Olfactory Modalities Tested by Removal of Aristae and Antennae, mentored by Jennifer Gleason

**Kyle Clark, Michael Fitzmorris, Ragan Armstrong, & Megan Rooney (#11)**, *Colletes inaequalis*: pheromone depths/distance & attraction, mentored by Deborah Smith

**Henry Escobar (#12)**, Male progeny output suggests sperm limitation as a result of sperm gigantism in *Zaprionus indianus*, mentored by Jennifer Gleason

**Michael Long (#13)**, A Highly Efficient Protocol for CRISPR Mutagenesis in *Drosophila virilis*, mentored by Justin Blumenstiel

**Brian Morris & Konner Cue (#14)**, Foraging Habits of *Colletes inaequalis*, mentored by Deborah Smith

**Christopher Norris, Emily Kaplan, & Katie Flynn (#15)**, Soil Analyses of *Colletes inaequalis* Nesting Aggregations, mentored by Deborah Smith

**Luke Schletzbaum (#16)**, Abundance of the endemic Baja lizard *Urosaurus nigricaudus* in relation to tree root system complexity, mentored by Maria Eifler & Douglas Eifler

**Rena Stair (#17)**, mtDNA Variation Among *Colletes inaequalis* on KU's Campus, mentored by Deborah Smith

**Arielle Swopes (#18)**, Social conflict affects sociality in the Prairie Vole, mentored by Adam Smith

**Justin Carlsten, Scott Rutherford, Tingting Guan, & Andrew Wilcox (#19)**, Fracking Impact Study: Continental U.S., mentored by Daniel Hirmas

**Zalma Molina (#20)**, Monitoring the northern advance of injection induced seismicity in southern Kansas, mentored by George Tsoflias & Alex Nolte

**Zach Flowers (#21)**, Measurement of the effect of turning off and on the magnetic field in the beam pipe substructure in the CMS detector in 2015, mentored by Phil Baringer & Anna Kropivnitskaya

**Jazmine Jefferson (#22)**, Muon Efficiency Study with Tag and Probe Tool at CMS experiment, mentored by Philip Baringer

**Zachary Wood (#23)**, A REMARKABLY SENSITIVE <sup>13</sup>C NMR APPROACH TO QUANTIFYING ELECTRONIC CHARACTERISTICS OF ISOCYANIDE LIGANDS, mentored by Misha Barybin

**Lawrence Chen (#24)**, Mechanical Properties of Double-Networked Hydrogels in Various Salt Solutions, mentored by Stevin Gehrke

**Karen Vazquez (#25)**, Measuring Energy Consumption in Buildings, mentored by Elaina Sutley

**4:00-4:30 – Break**

**Join us in the 4th floor lobby for snacks with your friends, mentors, and family.**

**4:30-5:30 - General Session 3**

**Oral Presentations – Sessions 3A-3J:**

**Session 3A: Centennial Room (6<sup>th</sup> Floor)**

**4:30: James Paisley**, Between the Dragon and the Eagle: U.S.-Taiwan Security and Chinese Military Development, mentored by Brian Lagotte & Megan Greene

**4:45: Zachary Kelsay**, Varying Experiences in the Cuban Dual-Currency System, mentored by Jennifer Foster

**5:00: Jeremy Barclay**, The Cuban dual-currency system, mentored by Jennifer Foster

**5:15: Jeffery Heppler**, Cuban Agriculture: Insights and Applications to U.S. Policy and Practice, mentored by Paul Stock

**Session 3B: Big 12 Room (5<sup>th</sup> Floor)**

**4:30: Malkie Hematillake & Yasmin Herdoiza**, What Factors Affect Our Emotional Reactions to Recalling Negative Memories?, mentored by Andrea Greenhoot & Robyn Kelton

**4:45: Amir Khaleghi**, The Effect of Religious Affiliation on Charitable Donation, mentored by Donna Ginther

**5:00: Mitchell Holmes, Chris Lansford, & Evan Jackson**, Automotive Demand and Trade Policy, mentored by Myunghyun Oh & Donna Ginther

**5:15: Sean Murray**, The Effect of Locus of Control on Rounding Up Donations, mentored by Jessica Yexin Li

**Session 3C: Pine Room (6<sup>th</sup> Floor)**

**4:30: Ike Uri**, Food Insecurity at the University of Kansas, mentored by Tracey LaPierre

**4:45: Daniel Whedon**, Are We Too Drunk to Have Sex? Students' Thoughts About Guidelines for Sexual Activity When Drinking, mentored by Jenna Lyons & Charlene Muehlenhard

**5:00: Emma Murrugarra**, Looking at Differences in Female Mental Health: The Role of Menstrual Hormone Regulation, mentored by Ruth Ann Atchley

**5:15: Chad Miller**, Being Gay or Homosexual: The Effect of Labeling on Anti-Gay Attitudes, mentored by Monica Biernat & Adrian Villicana

### **Session 3D: Jayhawk Room (5<sup>th</sup> Floor)**

**4:30: Olivia Borland**, Empowering Talk or Something More?: Exploring How Social Media is Used to Discuss Gender Balance in Local Government, mentored by Shannon Portillo & Nicole Humphrey

**4:45: Gabrielle Buckner**, Suppressed by Shame: Structural Impediments to Kenyan Girls' Education, mentored by Brian Lagotte

**5:00: Victoria Calderon**, Narratives of Victimization: The Disparity Between Sex Trafficking Survivors' Stories and U.S. Policy Implementation, mentored by Marta Caminero-Santangelo & Hannah Britton

**5:15: Dean Merris**, Attitudes Regarding Facebook's 'Legal Name' Policy and Effects on At-Risk Populations, mentored by Bill Staples

### **Session 3E: The Jay/Spare Room (1<sup>st</sup> Floor)**

**4:30: Erick Oduniyi & Brad Gibbons**, Modeling Ebola Transmission Dynamics With Media Effects, mentored by Myunghyun Oh & Folashade Augusto

**4:45: Eilish Gibson**, Measurement of the structure of the inner tracking detector of the CMS experiment using nuclear interactions, mentored by Phil Baringer

**5:00: C.W. Robertson**, Assessing the Chemical Abundances in a Population of Star-Forming Galaxies, mentored by Steven Hawley

**5:15: Andres Hernandez Guerra**, Target Location Using Ultrasonic Radar Systems, mentored by Christopher Allen

### **Session 3F: International Room (5<sup>th</sup> Floor)**

**4:30: Carla Rivas-D'Amico**, Taking Matters Into Our Own Hands: A Case Study of Abortion Activism in Lawrence, Kansas Before Roe, mentored by Beth Bailey

**4:45: Anthony Martin**, Immediate Effects of the Printing Press, mentored by Isidro Rivera

**5:00: Taylor McTague**, The Semantics of Ancient Greek Prostitution, mentored by Jane Barnette

**5:15: Marian Phillips**, From Therese to Nympho: The Power of Pornography in the 18th Century and the 21st Century, mentored by Ivery Goldstein



### **Session 3G: Divine Nine Room (6<sup>th</sup> Floor)**

**4:30: Ryan Fullerton**, "I Don't Know About This Monkey Business": Students and the Antievolution Movement, 1909-1935, mentored by Jonathan Hagel

**4:45: Michael Arnold**, Medical Breakthroughs in Spanish Literature: How the Cataclysm of Chronic Illness Introduced Vaccines to 19th Century Spain, mentored by Margot Versteeg & Hattie Miles Polka

**5:00: Isaac Welsh**, Selling Love and Power, mentored by Andrew Denning

**5:15: Caroline Huff**, Digitalization of Incunabula, mentored by Lorie Vanchena & Isidro Rivera

### **Session 3H: English Room (6<sup>th</sup> Floor)**

**4:30: Lauren Roberts**, "Englising," mentored by Isidro Rivera

**4:45: Danielle Peterson**, Uncovering Biases in Edith Grossman's Translation of "Don Quixote" by Miguel de Cervantes, mentored by Isidro Rivera

**5:00: Morgan Thevarajoo**, Inter-discipline in the Study of Art History, mentored by Isidro Rivera & Erik Alder

**5:15: Lauren Cassidy**, Germany's Response to Russia in Crimea, mentored by Lorie Vanchena

### **Session 3I: Parlors (5<sup>th</sup> Floor)**

**4:30: Caroline Roe**, Cine Extraño: Feminism in the Films of Alejandro Jodorowsky, mentored by Jenna Lyons

**4:45: Anne Marie Foley**, Queen Esther and Queen Vashti: Gender Roles in the United States, mentored by Ivery Goldstein

**5:00: Jessica Larson**, Gender, Race, Erasure and the Ethics of Broadcast News Coverage: A Case Study on the Orlando Nightclub Shooting, mentored by Jenna Lyons

### **Session 3J: Alderson Auditorium (4<sup>th</sup> Floor)**

**4:30: Evan Barnes**, Examination of 100% Orange Juice on Plasma Electrolyte Concentration and Rehydration following Repeated Endurance Cycling Exercise, mentored by Dawn Emerson

**4:45: Eli Renfro**, Bovine Tuberculosis in African cattle and buffalo with resource competition, mentored by Folashade Augusto

**5:00: Rebekah Wagner**, Transmission Dynamics for Methicilin-resistant *Staphalococcus aureus* with Injection Drug Users, mentored by Folashade Augusto

**5:15: Ana Huerta**, Investigating the Role of the Wnt Pathway and Runx Gene on Regeneration in *Nematostella Vectensis*, mentored by Pauly Cartwright

## Poster Presentations:

### Session 3L: Kansas Room (6<sup>th</sup> floor)

**Mary Bishop (#1)**, Children's Perceptions About Gender During the 2016 Presidential Election, mentored by Meagan M. Patterson

**Monica Carvajal Regidor, Julia Davis, Hannah Depriest, & Lauren Helms (#2)**, A Phenomenological Exploration of the Self-regulation Practices of Music Therapy Students: Findings from a Course-based Undergraduate Research Experience, mentored by Abbey Dvorak & Amy Smith

**Joel Gallegos (#3)**, The Use of Discretion in Banking Policy, mentored by Terri Friedline

**Zoe Lai (#4)**, Patient outcomes with an iPad application for home-based therapy of chronic low back pain, mentored by Brittany Melton

**Daniel Okolo (#5)**, Electronic Medical Records Impact on Nursing, mentored by Brittany Melton

**John Snyder, Jonathan Plagge, Alex Newkirk, & Yuhan Ye (#6)**, Examining the relationship between medicinal and recreational marijuana in Colorado, mentored by Dan Hirmas

**Hythem Abouodah & Yash Patel (#7)**, Values of Infantile Heart Rate During Habituation and GAP Tasks Across Age Groups, mentored by Brenda Salley

**Ansley Bender (#8)**, Connecting Attachment Style to Resilience: The Contributions of Self-Care and Self-Efficacy, mentored by Rick Ingram

**Layne Bozick, Anna Stumps, & Rucha Kandlur (#9)**, The Role of Context in Cognitive Performance, mentored by Evangelia G. Chrysikou

**Joseph Denning (#10)**, Using Phonographic Networks to Examine Spoken and Visual Word Recognition, mentored by Michael Vitevitch & Cynthia Siew

**Chelsey Faulkner (#11)**, The influence of gender on the perceptions of athletes and punishment, mentored by Chris Crandall

**Heather Jackson, Jennifer Boyce, Sarah Kuckelman, & Ryan Primovic (#12)**, Levels of Arousal in Non-Depressed Individuals During Mood Alteration, mentored by Evangelia G. Chrysikou

**Sarah King (#13)**, Sex, Alcohol, and Gender: College Students' Attitudes and Opinions About Sexual Consent as a Function of Gender and Level of Intoxication, mentored by Charlene Muehlenhard

**Katherin Morales & Jonathan Zhu (#14)**, The Impact of Personality on Electrodermal Response Due to Duchenne Smiling, mentored by Evangelia G. Chrysikou

**Alex Stover, Mandi Ward, & Bernadette Chinn (#15)**, Effects Of Racial Attentional Bias On Physiological Responses, mentored by Evangelia G. Chrysikou

**Liran Ziegelman (#16)**, The impact of classroom based physical activity on time-on-task and academic achievement in elementary school children, mentored by Joe Donnelly

**Liran Ziegelman (#17)**, Examining Changes in Cognitive Control Within the Prevention of Weight Regain Intervention, mentored by Joe Donnelly

**Brittany Bodenheimer (#18)**, Abortion Policy in Kansas: Public Opinion & Passage, mentored by Ivery Goldstein

**Haven Harbert (#19)**, How Heteronormative Stereotypes Build a Framework for Kink and Fetish Participants, mentored by Jenna Lyons

**Jessica (Jess) Lovett (#20)**, Cliché Queens: An Analysis of the Usage of Feminine Stereotypes in RuPaul's Drag Race, mentored by Ivery Goldstein

**Casey McDonald (#21)**, KU Sports and Title IX, mentored by Ivery Goldstein

**Allie Mellor (#22)**, Hooking-Up: A Generational Study on Commitment, mentored by Jenna Lyons

**Victoria Eberlein (#23)**, Rape Myths and American College Athlete Culture, mentored by Ivery Goldstein

**Zoe Bunton (#24)**, Reworking the Digital Binary: Nonbinary Self-Representation in Video Game Avatars, mentored by Jenna Lyons

**Kristina Padilla (#25)**, Gender in Print: A Content Analysis of Contemporary Motorcycle Advertisements, mentored by Ivery Goldstein

**Libby Sanders (#26)**, Sexualization of the Selfie: The Culture of Teenage Girls on Instagram, mentored by Ivery Goldstein

**Liza Stancliffe (#27)**, Shame, Breastfeeding and Instagram, mentored by Ivery Goldstein

**Erin Davis (#28)**, "For Us By Us?": Can something created for us be damaging to us, mentored by Jenna Lyons

**Lu Casarez (#29)**, Bibliographic Description: Hypnerotomachia Poliphili, mentored by Isidro Rivera

**Lindsey Freihoff (#30)**, The Imperfections of Book Copies, mentored by Isidro Rivera

**Sarah Langtry (#31)**, The Evolution of Print, mentored by Isidro Rivera

**Tanner Riscoe (#32)**, Spanish influence in the history of the book from the incunables of Juan Paríx to the creation of a dynasty by the merchant Juan Cromberger and the first transatlantic appearance of the printing press, mentored by Isidro Rivera & Erik Alder

**Taryn Stevenson (#33)**, The Influence of the Spanish Inquisition on Print Culture in 16th and 17th Century Spain, mentored by Isidro Rivera & Erik Alder

**Kimberly Young (#34)**, Woodcut Illustrations Representing Love in Early Printed Texts, mentored by Isidro Rivera

**Christy Altman (#35)**, The Gutenberg Bible, mentored by Isidro Rivera

**Calista Gorrell (#36)**, Dallas Museum of Underground Arts, mentored by Kapila D. Silva

**Sean Herrmann (#37)**, Museum for Cultural Environmentalism, mentored by Kapila D. Silva

**Caitlin McKaughan (#38)**, Dallas Museum of Agnotology, mentored by Kapila D. Silva

**Benjamin Naudet (#39)**, Dallas Deaf Art Museum, mentored by Kapila D. Silva

**Thomas Niemann (#40)**, Museum of American Christianity: connecting Christian cultures and telling their impacting stories throughout U.S. history, mentored by Kapila D. Silva

**McKenzie Samp (#41)**, Museum of Cultural Ignorance in Dallas Arts District, mentored by Kapila D. Silva

**5:30 – Symposium Banquet, Ballroom (5<sup>th</sup> floor)**

*For all student presenters, their mentors, and their guests. RSVP requested.*

**Welcome:** John Augusto, Center for Undergraduate Research

**History of the Symposium:** K. Barbara Schowen, Professor Emeritus, Chemistry

**Presentation of Awards:** Stuart Day, Senior Vice Provost for Academic Affairs

K. Barbara Schowen Undergraduate Research Mentor Award

Undergraduate Research Mentor Award

Outstanding Presentation Awards

**Hythem Abouodah & Yash Patel**

**Values of Infantile Heart Rate During Habituation and GAP Tasks Across Age Groups**

**Mentor(s):** Brenda Salley, Psychology

This paper looks at the correlation between infant age and attention using ECGs that were gathered via BioPak technologies and coded with Acqknowledge and BASICA. Infant heart rate is used as an indicator of attention. Attention values include: the times of onset and offset of attention, attention duration (the period between an onset and offset), and the number of glances throughout the attention duration. Attention values can be measured from infant ECGs. In this longitudinal study, the ECGs were gathered from infants of 6, 8, 10 and 12 months, as they underwent 3 different tasks. Video recording equipment was used to record the attention time and number of glances during the tasks. Averages of the onset, offset, and attention time were separately calculated for these infants, according to their age, and a comparison of these averages was then made. Data analysis has yet to take place. Attention has been used as a predictor for disorders, such as autism, in infants. Having standard values of attention span in healthy infants of different age groups can provide researchers with values to compare. We expect to observe an exponential increase in attention time as infants age, coupled with decreasing onset and offset times, regardless of task.

**Eric Alseth**

**New Pollution: The Effect of Rising Temperatures on the Rheingebiet**

**Mentor(s):** Lorie Vanchena, Germanic Languages & Literatures

Governments, people, and industry face an increasingly short supply of properly regulated water for agriculture and for public and industrial use. Despite the many laws that exist to protect the right to have access to clean water, pollutants and contaminants filter into water supplies around the world. Germany, for example, one of the most progressive countries in terms of environmental laws, is affected by thermal water pollution. Thermal pollution indirectly and insidiously alters the water supply. Warmer water creates risks, ranging from contributing significantly to global warming to destroying local flora and fauna. The biggest watershed in Germany is the Rheingebiet, the geographic area that feeds the Rhine river. Thermal pollution in this region is exacerbated by dense industry and population. In this project, I examine the problem of rising water temperatures by looking at scientific studies that quantitatively show the effects of water and air temperature changes. I consider the data in relation to the way in which society governs aquatic resources. This project looks at how thermal pollution affects individuals and public health and safety interests. I then discuss how these obstacles correspond with the multi-tiered system of water protection in the Rheingebiet. I found that the current system can adequately protect water in Germany, but when it comes to thermal pollution, governments need to pass more legislation to fully protect the water supply.

**Christy Altman**  
**The Gutenberg Bible**

**Mentor(s):** Isidro Rivera, Spanish

This project talks about the three different versions of the Gutenberg Bible and why they are important.

**Emma Anderson**

**What variables predict the number of AP STEM courses that public high schools in the state of Kansas offer?**

**Mentor(s):** Thomas DeLuca, Education Leadership & Policy Studies,

Advanced Placement (AP) courses were originally intended to let advanced high school students earn college credit before entering the postsecondary level. As it has expanded, AP is present in all 50 U.S. states, but the data show access to AP courses is inequitable. Previous research shows that students who tend to have limited access to AP include rural students, racial minorities, and students with low socioeconomic status (Klugman, 2013, p. 1-2). This research examines the predictors of access to AP STEM courses in public high schools in the state of Kansas. The data, collected by school district, describes both community-based and school-based variables that can have an impact on schools offering AP courses. Through multiple linear regression analysis, it was found that enrollment numbers and the educational attainment of the community are greater predictors of AP access than percent free and reduced lunch rates, per pupil spending, percent white population, percent households with public assistance, and median household income. Two interviews were conducted with administrators at Shawnee Mission Northwest High and Perry-Lecompton High to get both a suburban and a rural perspective, respectively. Opposing situations were apparent, with the suburban setting showing ease with implementing and expanding AP, while the rural setting admitted to struggling to get students to have the proper college prep resources. The research findings are important to policy creation to improve equitable education access as well as to teachers and administrators to work to try to combat those inequities.



**Michael Arnold**

**Medical Breakthroughs in Spanish Literature: How the Cataclysm of Chronic Illness Introduced Vaccines to 19th Century Spain**

**Mentor(s):** Margot Versteeg, Spanish & Portuguese

This presentation combines a passion for both the Spanish language and medicine, blending together the literary genius of 19th century Spanish short stories and the medical history that led to some of the most recognizable breakthroughs of modern medicine. Utilizing a synthesis of 19th century Spanish literary short stories, this project will illustrate how the conditions and stigma of chronic illnesses like tuberculosis in 19th century Spain formed the context for the introduction of vaccines into western civilization and medicine.

The goal of this oral presentation based on a PowerPoint is to demonstrate how the poor conditions, social exile, and imminent demise of patients of chronic illnesses of the time period were portrayed in Spanish literature throughout the 19th century. This project shall provide both a commentary on the medical conditions of this specific era in Spain as well as exhibit how the literature of the time period chronicled the necessity and outcome of revolutionary medical breakthroughs such as the vaccines against tuberculosis, cholera, and yellow fever.

**Harrison Baker**

**Implicit Bias Towards LGBTQ+ Identified Individuals Through Resume Evaluation**

**Mentor(s):** Jenna Lyons, Women, Gender, & Sexuality Studies

Through examining the relationship between implicit, internalized bias and hirability of queer individuals this paper frames the research question with concepts about bias and power. It was assumed that the non-heterosexual male “applicants” will be judged more harshly than heterosexual males in all measures while non-heterosexual female “applicants” will be judged less harshly than their heterosexual counterparts. Through the use of a 2x2 factorial designs interactions between the sexuality of the “applicant” and gender of the “applicant” which gives a more holistic view of the biases people have towards those members of society. This particular research supports previous research that has been completed, thus strengthening the field. Beyond that it creates the ground for new, unique research in the future either by building off of this study or by using the data to create something completely new.

**Jeremy Barclay**  
**The Cuban dual-currency system**

**Mentor(s):** Jennifer Foster, Spanish and Portuguese

In order to analyze the effective exchange rate and the effect of the dual-currency system, this research will be using an economic principle known as Purchasing Power Parity. Purchasing Power Parity selects from a list of common goods existing in both countries and determines per unit value of goods in the respective domestic currencies. This then allows an approximation of what the exchange rate ought to be based on a trade of goods rather than investor speculation or governmental interference. Though there are many methods of exactly calculating the Purchasing Power Parity between two currencies, we will be using the agreed upon "market basket of goods" from the consumer price index as determined in 2012.

**Evan Barnes**

**Examination of 100% Orange Juice on Plasma Electrolyte Concentration and Rehydration following Repeated Endurance Cycling Exercise**

**Mentor(s):** Dawn Emerson, Health, Sport, & Exercise Sciences

Hydration has been at the forefront of exercise research throughout the past decade, concentrated primarily on how certain beverages enhance sports performance. Research typically focuses on carbohydrate-electrolyte beverages (CEB) and water as means for hydration, but little to no research has been done on the influence of orange juice (OJ) on exercise performance. This project will seek to better understand that question by researching the effects of OJ supplementation on plasma electrolyte levels during highly aerobic exercise. The purpose of this study is twofold: 1) to determine the acute effects of 100% OJ on plasma electrolyte levels compared to CEBs following an intense cycling session, and 2) to determine the effects of daily 100% OJ on plasma electrolyte levels compared to CEBs over repeated intense cycling sessions. A cohort of 30 moderately endurance trained subjects will undergo 5 submaximal cycling exercises at 80% of their predetermined peak oxygen consumption over the span of 11 days. The subjects will be randomly assigned to 3 beverage conditions: water, OJ, and CEB, and will consume 237 ml/day during the study. Blood will be collected pre-, post-, and 1hr post-exercise for plasma electrolyte analysis. Due to the lack of research surrounding OJ consumption and exercise physiology, this study will allow for academic insight and new literature to the field.

**Ansley Bender**

**Connecting Attachment Style to Resilience: The Contributions of Self-Care and Self-Efficacy**

**Mentor(s):** Rick Ingram, Psychology

Contributors: Kelsey Hagan

The current study evaluates the roles of attachment security, self-efficacy, and self-care in resilience levels among a sample of 279 undergraduate students at the University of Kansas. Specifically, it was hypothesized that self-efficacy and self-care would mediate the association between attachment security and resilience, such that individuals with more secure attachment would experience improved resilience via increased self-efficacy and more frequent practice of self-care. Participants were administered online surveys to assess the relevant factors. Missing data analysis showed that 0.249% of data was missing; multiple imputation was completed in SAS with eleven imputed data sets. In SPSS, correlations were calculated between variables and three multiple mediation models were run, using 10,000 bootstrapped samples. Comfort with closeness and ability to depend on others both positively correlated with resilience, while rejection anxiety negatively correlated with resilience. These relationships were partially mediated by both self-care and self-efficacy, in the expected directions. These findings indicate that attachment style may relate to resilience through the practice of self-care and endorsement of self-efficacy. For clinicians treating a vulnerable client, it may be preferable to focus efforts on these more malleable factors, rather than attempting to modify attachment security.

**Matthew Bierbaum**

**Sex Discrimination in Males of *Zaprionus indianus* by Hearing or Olfactory Modalities Tested by Removal of Aristae and Antennae**

**Mentor(s):** Jennifer Gleason, Ecology & Evolutionary Biology

**Contributors:** Kaila Colyott & Paula Roy

For an organism to determine the sex of another individual, an individual needs to assess sexual identity cues before and during courtship. Sex discrimination allows for males to be more efficient during courtship and not waste time courting another male. The physiological mechanisms that the fruit fly *Zaprionus indianus* uses to discriminate between male and female flies of their same species during courtship are unknown. While working with *Z. indianus* we observed that males rarely attempt to court other males, implying that sex discrimination occurs prior to the initiation of courtship. Although males and females look the same to us, they may differ in their mating song, smell, taste, or general behavior. We tested the hypothesis that olfactory cues are necessary for sex discrimination. Flies detect olfactory cues by their antennae and in removing them, we have to remove the aristae as well because aristae are located distally on the same appendage. Aristae are necessary for detecting auditory communication but we have preliminary evidence that sound does not play a role in *Z. indianus* courtship. We first tested if aristae removal has an effect on sex discrimination before testing antennae. Focal males were video recorded in the presence of a male and a female and the amount of courtship directed toward the male and the female was measured. The focal males included males that had their sensory reception modified (either removal of aristae or antennae) and males that were unmanipulated. Aristae trials and antennae trials differed significantly implying variable sensory discrimination of males. In future studies the sex discrimination importance of vision and gustatory reception can be examined.

**Mary Bishop**

**Children's Perceptions About Gender During the 2016 Presidential Election**

**Mentor(s):** Meagan M. Patterson, Educational Psychology

The 2016 presidential election presented a unique opportunity to investigate children's knowledge and attitudes about gender within politics. Although we interviewed children before and after the election, our core focus was not on change over time, but instead on thoroughly documenting children's attention to, knowledge of, and views on the role of gender in the election.

We interviewed children from the ages of 5-11 of different age, race, and gender, both before and after the election. We collected quantitative and qualitative data, asking them questions about their perceptions of the election, what they expected the outcome to be, and their personal aspirations to become president. We were particularly interested in children's thoughts about the role of gender in the election and how it would affect the outcome.

Although the majority (64.7%) of children are aware that there has never been a female president, a larger quantity (90.8%) indicated that both men and women should be able to take the role as president and that the lack of female presidents is unfair. Data showed that boys and girls equally viewed the lack of female presidents as unfair. Overall, boys and girls expected more women than men to vote for Clinton. The majority (about 50%) of children said that they wouldn't want to be president, but felt as if they could be. The percentage of girls that thought that they could be president did not decrease from the pre-interviews (67.7%) to the post-interviews (75%).

**Brittany Bodenheimer**

**Abortion Policy in Kansas: Public Opinion & Passage**

**Mentor(s):** Ivery Goldstein, Women, Gender, & Sexuality Studies

This research seeks to understand the complexities of Kansas abortion policy by accounting for the myriad factors that contribute to its enactment. Expanding upon David Mayhew's re-election principle, I begin with the understanding that Kansas state legislators' actions are primarily motivated by a desire to be re-elected. I argue that this desire to be re-elected is served by acting upon constituents' views, particularly on the issue of abortion. From here, I argue that these behaviors and subsequent policy on the issue of abortion can be predicted by accounting for legislator demographics, voter demographics, and public opinion markers, such as nonprofit actions and local organizing efforts.



**Olivia Borland**

**Empowering Talk or Something More?: Exploring How Social Media is Used to Discuss Gender Balance in Local Government**

**Mentor(s):** Shannon Portillo, Public Affairs & Administration

For over 40 years now, the lack of representation in Chief Administrative Officer positions in local government has been an issue that scholars and practitioners of the profession have examined and attempted to solve in task forces. In more recent years the movement for balanced representation in local government has been taken to social media. #13Percent is a hashtag movement that has become a popular form of communication between mostly women who are practicing scholars and professionals in local government. This research project is utilizing the relatively new lens of social media to explore the issue of gender balance in local government. The goal of this project has been to discover whether social media is used as just an outlet for expressing thoughts and sharing uplifting messages or if is being used to suggest and structural changes that could help solve the problem of gender inequality. To explore this topic, I have collected and coded data in the form of tweets using the hashtag #13percent. Through the analyses, I am primarily attempting to understand whether or not these tweets are discussing structural change or simply promoting the idea of gender equality and focusing on positive messages.

**Layne Bozick, Anna Stumps, & Rucha Kandlur**  
**The Role of Context in Cognitive Performance**

**Mentor(s):** Evangelia G. Chrysikou, Psychology

We investigated the effects of faulty expectations on performance and physiological arousal due to stress. Participants were administered the revised Life Orientation Test (LOT-R) followed by a task of 10 difficult anagrams and post-task questionnaire. For the task, the participants were randomly assigned to an incongruent and congruent group. The incongruent group was misinformed that the anagrams were easier than they actually were. Electrocardiography (ECG) and electrodermal activity (EDA) measured heart rate and skin conductance, respectively. Our results showed superior anagram performance by the congruent group, however, the difference between groups was not statistically significant. There was no significant difference found in the mean physiological measures between the two groups. This study contributes to our understanding of the effects of incongruent verbal persuasion on task performance.

**Kathryn Brewer**

**Assessing the Post-Translational Modification of PvdJ Module 2 in  
*Pseudomonas aeruginosa***

**Mentor(s):** Audrey Lamb, Molecular Biosciences

**Contributors:** Annemarie Chilton

Increasing occurrences of infection by antibiotic resistant bacteria are a serious problem for modern medicine. One problematic pathogen, *Pseudomonas aeruginosa*, attacks immunosuppressed patients such as those with HIV and cancer, as well as cystic fibrosis (CF). Indeed, *P. aeruginosa* is one of the leading causes of lung infections in CF patients. A current area of study for *P. aeruginosa* includes examining siderophores, low molecular weight iron chelators synthesized and secreted to acquire iron. *P. aeruginosa* produce nonribosomal peptide synthetases (NRPS), which work in an assembly line to synthesize siderophores. In this project, the structure of the second module of the NRPS called PvdJ (PvdJ-M2), which adds the amino acid formyl-hydroxyornithine to the siderophore pyoverdine, will be determined. Our goal is to exploit a modified coenzyme A (CoA) molecule to promote a stable conformation of the condensation domain for crystallization. This modified CoA will be added via a phosphopantetheinyl transferase (PPTase). The specific *P. aeruginosa* PPTase in this project was recently purified from an *E. coli* overexpression system, so research is underway to assess the ability of the PPTase to add CoA to PvdJ-M2. A fluorescent CoA probe has been synthesized using 7-diethylamino-3-(4-maleimidophenyl)-4-methylcoumarin (CPM) and used to visually detect the activity of the PPTase. While the fluorescent CoA has been successfully attached to PvdJ-M2, recent developments have uncovered a possibility of nonspecific binding, potentially due to the presence of excess CPM reacting with cysteine residues in the module. Future work includes improving the purification method for the fluorescent CoA to remove excess CPM and reevaluating the attachment of fluorescent CoA. Once the phosphopantetheine group from CoA can be reliably added to PvdJ-M2, new derivative CoA molecules will be developed to trap PvdJ-M2 at different stages of catalysis.

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**Matthias Bryson**

**St. Winefride's Well and the Preservation of Catholic Community in Early Modern England and Wales**

**Mentor(s):** Katherine Clark, History

This talk shares the results of research on the veneration of St. Winefride at her shrine in Holywell, Wales, one of the few Catholic shrines in England or Wales to survive the religious reforms of the sixteenth and seventeenth centuries. The figure of St. Winefride had a reputation as a powerful healer, and pilgrims flocked to her shrine to seek miraculous cures. This research argues that St. Winefride's shrine survived the Reformation because the Jesuit missionaries and lay pilgrims at her shrine worked together to successfully reinterpret St. Winefride's role to meet the challenges of a Protestant society. The figure of St. Winefride evolved from a medieval healing saint into a powerful protector of Catholics. This talk examines three aspects of St. Winefride's cult at Holywell in the sixteenth through eighteenth centuries. First, it argues that St. Winefride's worshipers conceived of her shrine as a bodily relic of the saint. Second, it explores how pilgrims looked to St. Winefride to provide social order. Finally, it examines the relationship between Catholic identity and Welsh national identity. Scholarship on Catholicism in early modern Britain too often focuses on Catholics as victims, either worshiping in secret or facing martyrdom. This research challenges this view. At St. Winefride's shrine Catholics worshiped openly, in public, in spite of persecution and the threat of arrest. The results of this study can be applied to other centers of Catholic worship to improve historians' understanding of the experiences of early modern Catholics in England and Wales.

**Gabrielle Buckner**

**Suppressed by Shame: Structural Impediments to Kenyan Girls' Education**

**Mentor(s):** Brian Lagotte, Global & International Studies

The research question looks at how Zero Stains Initiative, a non-profit aimed at assisting menstrual hygiene management, and their dispersal of sanitary products affect a Kenyan girl's education. Kenyan girls receiving aid for menstruation may directly correlate with higher attendance rates in school. This project will use feminist theory to understand how patriarchal societal structures can suppress the female voice by disregarding men and women's different needs. Without supporting women's issues, such as menstruation, androcentric policies may not take women's issues into account and create gender inequity. The project will use qualitative interviews with Kenyan schoolgirls from the Busia County Region to capture perspectives on cultural expectations regarding menstruation and ask how Zero Stains Initiative's sanitary products have affected their lives. Qualitative comparative analysis will be used to identify if the new component of Zero Stains yields a different outcome that keeps a girl in school during menstruation. In addition, qualitative comparative analysis can track trending factors that consistently result in a girl's absence from school during menstruation. The project theorizes cultural stigmas and a lack of sanitary products stack the odds against Kenyan girls who desire an education. By implementing initiatives intended to help menstruating girls, such as Zero Stains, I hypothesize that Kenyan girls will be better equipped to stay in school. Thus, with non-profit initiatives bringing menstrual issues to the surface, menstruation may not continue to serve as a non-existent problem by patriarchal governments.

**Zoe Bunton**

**Reworking the Digital Binary: Nonbinary Self-Representation in Video Game Avatars**

**Mentor(s):** Jenna Lyons, Women, Gender, & Sexuality Studies

This paper examines how nonbinary-identified people express nonbinary identities in video games with binarized tools of character customization. Despite the lack of gender diversity in most video game character creation engines, players are reworking these non-representative tools to represent nonbinary identities in games. Much research on avatars and custom characters tends to focus on the lack of queer representation in games or the use of avatars for identity exploration. This existing research suggests that if an identity is not programmed into a game, players simply are not creating characters with that identity. No research examines how people with marginalized gender identities continue to represent themselves in games, despite programming that suggests their existence is impossible. This paper uses grounded theory to argue that nonbinary people use non-representative character creation engines and supplementary tools to represent themselves in games. The research in this paper is conducted using a survey and a series of interviews with nonbinary video game players to understand if and how nonbinary people are creating nonbinary video game characters. The interviews are analyzed as case studies to represent some of the many ways nonbinary players represent nonbinary gender under restricting and non-representative circumstances. An application of performativity, disidentification, and audience study theories reveals that the tools a game provides and their attached meanings do not determine how players play with or trouble the game's parameters. Therefore, while representation remains an important issue, non-represented players still work to represent their identities in games. This research is important to better understanding how marginalized audiences interact with and transform non-representative texts.

**Victoria Calderon**

**Narratives of Victimization: The Disparity Between Sex Trafficking Survivors' Stories and U.S. Policy Implementation**

**Mentor(s):** Marta Caminero-Santangelo, English

Human trafficking is a monumental issue around the world. The United States Trafficking Victims Protection Act (TVPA) of 2000 estimated that 700,000 people around the world are trafficked each year for the purpose of providing labor or sex. Since the late 1990s, legislation has been appearing globally to combat this phenomenon, with the TVPA being the first of its kind in the U.S. Since then, despite the broad definition of human trafficking victimization provided by the law, victim-survivors of sex trafficking are still being treated as "prostitutes" by society and are subsequently criminalized by antiquated laws. Certain survivors of commercial sexual exploitation that fall under the category of victim by the TVPA are being perceived as complicit in their own exploitation by law enforcement, courts, and communities. The reasons for their perception as a guilty criminal instead of a victim-survivor are often due to various larger social issues, such as race and citizenship status; however, the factors that connect the narratives and serve as the focus of my project are agency, socioeconomic status, relationship to trafficker, sexuality, addiction, prior criminal record, and behavior as a youth.



**Justin Carlsten, Scott Rutherford, Tingting Guan, & Andrew Wilcox,  
Fracking Impact Study: Continental U.S.**

**Mentor(s):** Daniel Hirmas, Geography

Hydraulic fracturing is a method of natural gas mining that uses high-pressure liquid pumped into the ground to create fissures in the rock for the gas to escape. Despite controversy, this method is common in the continental United States and accounts for most of its natural gas wells. We speculated that the fracking process is responsible for an increase in earthquakes in previously stable areas. The goal of this study is to relate historic earthquake data through the present and relate it to the introduction of fracking in the study areas to see if there is any correlation between the two. Our source data for earthquakes and well locations comes from the USGS and is processed in ARCMAP. The results and implications of our findings will be presented and discussed.

**Monica Carvajal Regidor, Julia Davis, Hannah Depriest, & Lauren Helms**  
**A Phenomenological Exploration of the Self-regulation Practices of Music**  
**Therapy Students: Findings from a Course-based Undergraduate Research**  
**Experience**

**Mentor(s):** Abbey Dvorak, Music Therapy  
**Contributors:** Jacob Dakon & Sekyung Jang

Self-regulation is defined as “self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals” (Zimmerman, 2000, p. 14). The purpose of this phenomenological research study was to explore the self-regulation practices of music therapy students as they prepare for their clinical practicum work with clients. Due to the lack of information in this area, an inductive, qualitative approach to gather information from the point of view of students was used. As part of an IRB-approved study in a course-based undergraduate research experience, research team members (MEMT 296 students) interviewed upper level music therapy students involved in practicum (N=17) to better understand their thought processes, preparation of music and verbal discourse, resources used during preparation, and their planning of the overall structure of the intervention. Research team members (RTMs) transcribed interviews, analyzed transcripts using first and second cycle coding, and worked with team members to generate overall themes. A graduate research consultant (GRC) met with RTMs to evaluate their initial coding of the interviews and to plan an in-class small group presentation of their initial findings. This research poster reflects the findings of MEMT 296 students using the data set of collected interviews.

**Lu Casarez**

**Bibliographic Description: Hypnerotomachia Poliphili**

**Mentor(s):** Isidro Rivera

**Contributors:** Mindy Babarskis, Alex Martin, & Kimberly Young

The project is based on being able to know more about the elements of a book. Providing information about the binding and other significant features about the book such as, pages, initials, colophon, hand notes and including illustrations. Making the audience wonder why the book was made a certain way and for them to start thinking on the decisions and marks of this book. The poster gives a higher view for the audience to see the pages of the book. My purpose is for the poster to demonstrate how the Hypnerotomachia Poliphili is a book with interesting elements and how they are different from just a common book today. Furthermore, the poster consists on showing the elements of the book and brief information about the bibliographic within the Hypnerotomachia Poliphili

**Lauren Cassidy**

**Germany's Response to Russia in Crimea**

**Mentor(s):** Lorie Vanchena, German Language & Literatures

My research project illustrates that Germany's foreign policy toward Russia has changed since the Ukrainian crisis in 2014. Although Germany responded to Russia aggression very cautiously after the crisis, it did implement a tougher policy towards Russia. Germany was forced to mediate politically between Russia and NATO. My research shows that Germany had difficulties dealing with both NATO and Russia on this issue. Due to the history of Ostpolitik, or eastern policy, between Germany and Russia and the economic connections between the two countries, Germany had many problems implementing sanctions against Russia. Although Germany strives to maintain a strategic relationship with Russia, the country must also fulfill its obligations to NATO. Germany now defends the sanctions against Russia, but the goal is still to strive for a good diplomatic relationship. This research demonstrates that Germany's relationship with Russia today is much more strained than it was before the Ukrainian crisis.

**Jacob Chamberlin**

**The Influence of High School Athletes' Perceptions of the Motivational Climate on Athletic Identity and Academic Endeavors.**

**Mentor(s):** Mary Fry, Health, Sport, & Exercise Science

Athletics are an important part of many students' lives, and can enrich their overall student experience (Hansen, Larson, & Dworkin, 2003). Poux and Fry (2015), employing Achievement Goal Perspective Theory, found that Division I collegiate athletes who perceived a high caring/task-involving climate on their sport teams were likely to report more engagement in their academic and future career preparation as well as a high athletic identity. These researchers suggest that athletes' commitment to both athletics and academics can compliment one another. These relationships with college athletes have not yet been examined with high school athletes. The purpose of this study, then, was to examine the relationship between high school athletes' perceptions of the motivational climate to their academic motivation, academic endeavors, athletic and academic identities, and coach and teammate support. Athletes (N = 228: 75 females & 146 males; Mage= 15.8 years, SD = 1.09) participating in fall sports at high schools located in the Midwestern region of the U.S. completed a survey that included the measures of interest. A canonical correlation analysis revealed one significant function [ $L = .50$ ,  $F(18) = 7.68$  ( $p < .001$ ); The canonical correlation was .67 with 44% overlapping variance]. In accord with the loadings, athletes who perceived a high caring/task-involving climate reported higher career self efficacy, engagement in their academic and future career preparation, academic identity, and team and coach support. A caring/task-involving motivational climate in sport settings may be critical in developing high school athletes' ability to pursue academic endeavors outside of sports and feel supported.

**Lawrence Chen**

**Mechanical Properties of Double-Networked Hydrogels in Various Salt Solutions**

**Mentor(s):** Stevin Gehrke, Chemical & Petroleum Engineering

**Contributors:** Anahita Khanlari & Tiffany Suekama

The purpose of this experiment was to test the mechanical properties of 10 wt% methacrylated hyaluronic acid combined with 20x1 polyacrylamide double-networked hydrogels. Double-networked hydrogels are of interest to researchers because of their tendency to combine desirable properties of two different gels; for example, MHA is more brittle, but stronger, while polyacrylamide deforms readily with low elastic modulus, so in this case the double-networked gel is tougher and less readily deformed than the individual components. Small cylindrical gel samples were prepared, and groups of these samples were soaked in different molarities and types of salt solutions (Sodium Chloride, Calcium Chloride, and deionized water). Then, these gels were placed in a dynamic mechanical analysis (DMA) machine to test their viscoelastic properties with respect to compression until failure. After this, the gels were weighed, desiccated, and then weighed again to calculate the ratio between the wet weight and the dry weight, known as the swelling degree (Q). From the compression data, the student can calculate the toughness, strain %, strain function, elastic modulus E, shear modulus G, and Mooney Rivlin plot data. We are especially interested in the deviation from "ideal elastomer" behavior of the double-networked gel properties.

**Cedric Clark**

**Targeting  $\beta$ -barrel Outer Membrane Proteins in the Fight Against Antibiotic Resistance**

**Mentor(s):** Joanna Slusky, Molecular Biosciences and Computational Biology

Heavy use of antibiotics over the years has created bacteria that are resistant to them. Meanwhile, the pharmaceutical pipeline for new antibiotics has almost run dry. A of broad spectrum of antibiotic resistance is obtained when antibiotics cannot reach their targets as proteins called efflux pumps push the antibiotics out of the cell. These efflux pumps have an outer membrane component made up of a multi-chain  $\beta$ -barrel. By understanding what interactions allow the chains in the  $\beta$ -barrel to interact with each other, researchers can use those interactions to design inhibitors for these proteins to mitigate the efflux of antibiotics. In this study, we will look at key interactions that occur between pairs of amino acids across chains of  $\beta$ -barrel outer membrane proteins (OMPs). Glycine rescue, salt bridge, and hydrogen bonding interactions are hypothesized to increase the strength of chain-to-chain folding. They have been introduced through specific mutations made to a  $\beta$ -barrel protein of interest by using primers to alter the genomic sequence. An aromatic rescue and a salt bridge interaction has been introduced and expressed. We are developing methods to express, purify, and refold these proteins. We can then assess their ability to fold and the stability of that fold in model membrane systems. This research will provide insight into how to design proteins to target these interfaces and disable efflux pumps so bacteria can be made more susceptible to antibiotics.

**Kyle Clark, Michael Fitzmorris, Ragan Armstrong, & Megan Rooney**  
***Colletes inaequalis*: pheromone depths/distance & attraction**

**Mentor(s):** Deborah Smith, Ecology & Evolutionary Biology

*Colletes inaequalis* is a solitary bee that is common within Kansas and other North American locations. The species *Colletes inaequalis* is primarily active during the spring season in Kansas. Research shows an active compound in species of *Colletes cunicularius*' pheromones is enantiomerically pure (S)-(+)-linalool (Borg-Karlson et al 2003). In other species of *Colletes*, linalool was also demonstrated in a behavioral study to be a male attractant, and greatly diminished in production once the female had found a mate (Borg-Karlson et al, 2003). Similarly, citronellol was identified within *Colletes inaequalis*. What effect will female pheromones have on larger groups of males? Will they aggregate in groups near the pheromone release site, or due to the presence of others, leave the area?

There has been speculation as to whether or not the male bees, which emerge several weeks before the female bees (Batra 1980), can sense the pheromones she releases before she emerges from the ground. Research has shown that male bees will detect emerging males and females and excavate them in an effort to mate as soon as possible (Cane & Tengo 1981). It is not known, however, how deep the male bees can sense or smell these pheromones. Can they detect high concentrations or low concentration of (S)-(+)-linalool/Citronellol? At what depth will male bees begin flight activity around the pheromone, actively searching for a freshly emerged mate? How effective are the acyclic monoterpenoids Linalool and Citronellol at attracting *Colletes inaequalis*?



**Courtney Coda**

**Nietzsche, Kant, and Feminist Ethics**

**Mentor(s):** Ivery Goldstein, Women, Gender, & Sexuality Studies and American Studies

In feminist scholarship, authors often rely on ethical theories to support their arguments. Feminist ethics has worked to critique some traditional ethical theories for their treatment of women and power. This paper answers the question of, between Nietzsche's noble ethics and Kant's categorical imperative, which better supports feminist ethics? I argue that Nietzsche's noble ethics better upholds feminist ethics, based on what the theory offers for feminist scholars. To do this, I first describe what feminist ethics aims to accomplish in addition to developing and providing my definition of feminism. I then examine the treatment of the two theories within feminist ethical literature, followed by my own analysis of each theory. Finally, I argue that Nietzsche's noble ethics provided feminist scholars with tools to critique socially constructed theories of ethics and morality. Contrastingly, Kant's categorical imperative attempts to universalize morality while treating individuals as interchangeable and ignoring identity and power differences. Due to this, I claim that Nietzsche's noble ethics are more favorable in terms of feminist ethics and for feminist ethical scholars.

**Paige Cook**

**God Save the Tartan and the Dirty Punk: A look into how the Tartan print came to symbolize the Punk Rock movement in 1970s England**

**Mentor(s):** Andrew Denning, History

The Scottish Tartan currently and historically is one of the most iconic images of Scottishness and rebellion. From its roots in the Jacobite rising to King George the Fourth; it has remained a permeant fixture. The Tartan has however been able to cross boundaries and become an image of rebellion and resistance for many other wearers and movements. My research will focus on how the Scottish Tartan print came to symbolize the strength of the Punk Rock movement in 1970s England.

Focusing on the history of material culture, history of Punk counterculture, and the History of England 1969-1979. Gives valuable insight into the overall research of the case study while also highlighting the lack of work done on the topic of Punk Fashion. Punk Fashion showcases not only the disgruntled feelings of British youth but also the freedom of expression between periods of gentle domestic ways of life. Punk embraced loud dress, language, and actions which why the Tartan became adopted. Signifying the end of acceptance by British youth of the lack of employment, societal changes and economic failings of the state fueling the Punk movement.

The first section will look into Scottish history and the views of the Tartan print. Reviewing primary sources of the Kings travels to the Highlands and his thought of the traditional dress.

Second, will give us a background for the social unrest which was happening in England during the change in the times. The 1970s faced the Oil Crisis, power cuts and the introduction to the three day week.

Third and Fourth sections focus mainly on the Punk movement which started to the civil unrest during the 1970s in England. Two main characters come from this time as icon persons for the fashion, ideas, and music of Vivienne Westwood and Malcolm McLaren who push the boundaries of society.

**Saran Davaajargal**

**Effects of Environmental Attitudes of Managers and Employees on Environmental Management Endeavors**

**Mentor(s):** Dietrich Earnhart, Economics

As the world's environmental problems have become more severe in the recent years, effective environmental management efforts have become increasingly important. As large companies, especially the ones that directly emit pollution have significant impact on the environment, studying about the companies' environmental practices is essential to the improvement of the companies' environmental efforts. Furthermore, many studies have found employees' environmental involvement at their workplaces to be crucial in improving pollution control. Yet studies that explore what motivates the employees' and managers' involvement remain scarce. This research project aims to fill in this gap.

This project specifically explores the effect of the environmental attitudes held by managers and employees at large companies with chemical facilities. It aims to find out what extent the attitudes impact the companies' environmental management endeavors. More knowledge about managers' and employees' involvement can lead these facilities to make more informed decisions. Ultimately, more effective environmental efforts by large companies can reduce the negative impact the companies' operations have on the environment and help prevent more severe environmental problems.

**Erin Davis**

**"For Us By Us?": Can something created for us be damaging to us**

**Mentor(s):** Jenna Lyons, American Studies

This paper will address the underlying message Tyler Perry sends to his audience about blackwomen and their place in society. This essay will seek to understand the message being sent to the audience and how this could be damaging towards the community. This essay will reflect on the themes of Black Female Sexuality, Black Female Representation in Film, and most importantly Tyler Perry. Some of the topics that have been explored within Tyler Perry Films, are the type of man that he portrays in his films which leads to the question as to why no one has explored the exploitation of black women. Another route of researching female representation in film was that how black women are always portrayed as someone who supports the other characters, in the movie *The Help* it was referred to how it was supposed to be about the maids yet it was more about how the author was perceived as the savior, she was the reason they had a voice rather than their actual stories being the reason for change. This leads to understanding how black women are supposed to go through the hardwork and let someone else take on the recognition. This paper will examine the stereotypes that Tyler Perry portrays in movies to portray the strong black woman trope, these four movies create an image that black women can only be saved by God and then they themselves must save everyone else. The main themes that will be addressed are Strong Black Woman Trope, the idea of religion and the black woman how that is the only thing she can depend on, and most importantly though Tyler Perry makes his main characters black women what is the underlying message that he wants his female audience to receive.

**Cara Davis**

**Structural and Functional Characterization of a *Yersinia pestis* Opine Dehydrogenase Involved in Metallophore Biosynthesis**

**Mentor(s):** Audrey Lamb, Molecular Biosciences

Bacteria produce compounds called metallophores, which allow for the chelation of various metals from the surroundings. Metals are essential to many processes in bacteria, thus metallophores are of interest as inhibiting their production may slow bacterial infection. An operon encoding for a siderophore-producing biosynthetic pathway has been identified in *Yersinia pestis*. Metallophore biosynthesis involves two enzymes, the first of which likely combines a molecule of SAM and histidine, and the second combines that initial product with an unknown substrate, likely an  $\alpha$ -keto acid, leading to the metallophore. The goal of this project is to study the structure and enzymology of the second enzyme in the pathway, termed *Yersinia pestis* opine dehydrogenase (YpODH). Thus far, YpODH has been heterologously expressed in *E. coli* and purified using column chromatography. Initial crystal trials by sparse matrix screening yielded many potential crystal growth conditions. While optimization of crystal growth is underway, several crystals were tested for diffraction quality at the Stanford Synchrotron Radiation Lightsource. One crystal yielded a 2.3 Angstrom dataset, which will be used for molecular replacement trials using the previously determined opine dehydrogenase structures from king scallop and *Anthrobacter* as models. However, these proteins share low sequence similarity with YpODH, and likely experimental phases will be required. Crystal growth will continue to be optimized in order to increase the resolution. Future efforts include production of selenomethionine protein for anomalous phasing, and determination of the substrate through kinetic methods.

**Joseph Denning**

**Using Phonographic Networks to Examine Spoken and Visual Word Recognition**

**Mentor(s):** Michael Vitevitch, Psychology

**Contributors:** Cynthia Siew

Network science is a tool used to conceptualize and analyze the mental lexicon. In the past, phonological networks and orthographic networks have been treated as two separate types of language networks, but the proposed research seeks to demonstrate that considering the two networks as a single, holistic network, i.e., the phonographic network, will significantly increase our understanding of visual and spoken word recognition. Specifically, this project will examine if phonographic degree, which represents phonological and orthographic similarity among words, affects spoken and visual word recognition.

**Aidan Dmitriev**

**Structural Analysis of RsbU Reveals Sensor Activity for Metabolic Modulation in *Chlamydia trachomatis***

**Mentor(s):** P. Scott Hefty, Molecular Biosciences

**Contributors:** Scott Lovell

*Chlamydia trachomatis* causes ocular and sexually-transmitted infections that significantly impact public health. This obligate intracellular bacterium exhibits a biphasic developmental cycle and interactions with its host. However, the host signals that modulate developmental events and associated phenotypic changes are not completely understood. One signaling pathway that may respond to an external host signal is the Rsb phosphoregulatory network, which operates via a partner switching mechanism and regulates the activity of the main chlamydial sigma factor,  $\sigma_{66}$ .

In order to further understand the function of the Rsb network, this study focused on the role of its membrane-bound RsbU component. A crystal structure of the RsbU periplasmic domain was solved and refined to a resolution of 1.7 Å. This domain does not exhibit sequence-based similarity to support functional annotation, but high structural similarity to the histidine kinase sensor DctB revealed the presence of a C4-dicarboxylate sensor domain.

C4-dicarboxylates such as succinate and malate are substrates of the citric acid cycle (CAC), which is incomplete in *C. trachomatis*. In order to function, the chlamydial CAC must use imported host substrates. Therefore, we hypothesize that RsbU binds host C4-dicarboxylates that act as the signal to express genes implicated in CAC function and/or substrate influx.

**Victoria Eberlein**

**Rape Myths and American College Athlete Culture**

**Mentor(s):** Ivery Goldstein, American Studies & Women, Gender, and Sexuality Studies

In 2016 the University of Kansas had a rape allegation reported against one of their football players. In that same year the University of Minnesota had a rape reported against ten of their football players and one of their recruits. This essay will attempt to compare and contrast similarities and differences between these two schools such as, one is in the BIG 10 division and the other in the BIG 12 and, one had multiple rapists the other had one, etc. It will attempt to compare these similarities and differences to answer whether or not any of these characteristics made a difference in the outcome of the allegations. This essay will argue that the University of Kansas and the University of Minnesota perpetuated rape myths and victim blaming through cases involving football players in 2016 because of the culture they have created surrounding their athletes. This paper will argue this by exploring the details of the sexual assault reports, media statements, statements made by the universities, and the literature about stereotypes of rape and rape culture in American society. This essay will also make the argument that the University of Minnesota and the University of Kansas are just two examples of many Universities in the same situations and they are not the only two Universities creating specific societal norms for their athletes. Through understanding rape myths and the American culture surrounding athletics, one may better understand rape culture and how to fight back against rape, stereotypes, and myths.



**Henry Escobar**

**Male progeny output suggests sperm limitation as a result of sperm gigantism in *Zaprionus indianus***

**Mentor(s):** Jennifer Gleason, Ecology & Evolutionary Biology

**Contributors:** Kaila Colyott & Paula Roy

In Drosophilids with sperm gigantism, sperm is large, takes up space in the reproductive tract, and is costly to produce so that males have low sperm counts. Limited sperm production leads to differential sperm allocation, and therefore low total reproductive output. *Zaprionus indianus* is an invasive African Drosophilid that has sperm gigantism. Because the sperm of *Z. indianus* are large, we hypothesize that the species may be sperm limited, which reduces the number of females with which a male can produce offspring with. We determined male remating rate and offspring production quantity by allowing males to mate with a maximum of 48 females sequentially over a four-day period. Males remated frequently, but the offspring produced decreased significantly over the successive copulations. The progeny count analysis allows us to develop predictions about how males allocate their sperm across matings.

**Kaylisa Estes**

**A Case of Stigma and Mental Health within Black Female College Students:  
How stigma affects willingness to accept accessibility**

**Mentor(s):** Jenna Lyons, Women, Gender & Sexuality Studies

This paper will examine how community stigma within the female African-American community regarding mental illness limits their ability to accept access to mental health services at collegiate institution such as the University of Kansas. This paper will also explore how institutional methods may be ineffective in limiting stigma geared toward mental health by African- American female populations. The claim is that current stigmatized attitudes by African-American female populations at the University of Kansas, limits their ability to receive accessible mental health services. In addition, the university's methods in which mental health is advertised to minorities on campus does not actually increase retention of the above demographic but actually increases stigmatized attitudes towards mental health care and its services. By applying feminist theoretical frameworks and African/African-American theoretical intersections to the field of disability studies, one is able to study how both stigma and advertising methods increase stigma amongst minority populations and accessibility by institutions. By using quantitative data, qualitative surveys and focus groups one will be able to explore trending attitudes and demographic concerns related to each population (i.e. African-American female students, and the University of Kansas Mental Health Care facilities).

**Chelsey Faulkner**

**The influence of gender on the perceptions of athletes and punishment**

**Mentor(s):** Chris Crandall, Psychology

**Contributors:** Jason Miller & Ariel Mosley

This project will examine gender bias that people demonstrate toward male and female athletes. Double deviance theory suggests that people have biases against females who deviate from gender norms, and other rules or laws set forth by society, get persecuted twice as much as females who do not deviate from typical gender norms. Specifically, research shows that female athletes get more sporting and disciplinary sanctions than male athletes, as being an athlete violates typical gender norms. This suggests that people perceive punishment of female athletes as more justified than punishment of male athletes, or female non-athletes.

We expect that people perceive female athletes as deviant from the expected gender norms, and therefore will be more harsh when examining the negative treatment of female vs male athletes. We expect that participants will perceive punishment (suspension over a violation of a team rule) against a female athlete (vs. male athlete) as more justified. We expect that this effect will not exist among male and female members of a debate team. We also expect that participants' scores on sexism will moderate these effects.

**Abigail Fields**

**Man, society, and nature: A Rousseauist reading of Émile Zola**

**Mentor(s):** Christine Bourgeois, French & Italian

Émile Zola, a French author from the 19th century, and his 20-book collection following the Rougon-Macquart family marks, for many experts, the birth of French Naturalism. The characteristics of this literary school, including its descriptive realism, its application of a pseudo-scientific method, and its consideration of political or philosophical hypotheses within the confines of a described reality, have been extensively related to Zola's work. However there is little study to date of the social hypotheses that the author aims to prove through his writing. I shall argue that, through the Rougon-Macquart series, Zola presents the distinctly Rousseauist hypothesis of human devolution as the direct result of the expansion of societal structure and the related loss of connection to Nature.

Zola supports his argument with various methods, including realism characteristic of Naturalism, symbolism characteristic of literary Impressionism, and a preoccupation with heredity influenced by the current scientific research. Specifically, I shall explore the development of the female as a symbol for Nature, following the Rougon-Macquart genealogy from the original mother to its eventual collapse. I will draw parallels between this trajectory and the devolution of man and the breakdown of society as a result of disassociation from Nature. This study, which considers *La Fortune des Rougon*, *La Terre*, and *La Débâcle*, considers a subset of this series underrepresented by modern literary analysis, and explores a relationship between the philosophies of Rousseau and Zola, which has not yet been discussed in any detail with respect to the Rougon-Macquart cycle.

**Zach Flowers**

**Measurement of the effect of turning off and on the magnetic field in the beam pipe substructure in the CMS detector in 2015**

**Mentor(s):** Phil Baringer, Physics & Astronomy

**Contributors:** Anna Kropivnitskaya & Eilish Gibson

The beam pipe is the structure in the CMS detector where particle collisions take place. In 2015, the magnet of the LHC was frequently turned off and on. This can cause the beam pipe to move over the course of the year. We have performed a measurement of the beam pipe, using nuclear interactions inside the inner tracking detector that houses the beam pipe. The data come from proton-proton collisions at a center-of-mass energy of 13 TeV. Secondary vertices are reconstructed from hadronic interactions with the detector material. We found that the position of the beam pipe remained stable during 2015.

**Anne Marie Foley**

**Queen Esther and Queen Vashti: Gender Roles in the United States**

**Mentor(s):** Ivery A. Goldstein, Women, Gender, & Sexuality Studies and American Studies

This research paper examines two biblical women; Queen Esther and Queen Vashti. It will examine how the two women are depicted in the Book of Esther, and how the story reinforces, creates, and maintains dichotomies and gender roles in the United States. By examining the two Queens, we can begin to analyze and articulate how gender roles in society are under surveillance from both people and institutions. Other than the Book of Esther, the sources used in this paper have been from the past fifteen years and focus on Queen Esther specifically. I have used literature analysis and theories as research strategies. Data has been collected from the Old Testament, scholarly articles, and #IamEsther on social media. This research paper challenges the traditional understanding of the relationships between Queen Esther and Vashti's roles in the Bible and how that interacts or shapes women's lives today through dichotomies. The paper will connect scholarly literature and theories to a current movement called #IamEsther which seeks to unite women to be like Queen Esther in the current political climate.

**Sophia Fortmeyer**

**Mining Transparency in Zambia and the DRC**

**Mentor(s):** Brian Lagotte, Global & International Studies

**Contributors:** Ebenezer Obadare

This research focuses on the sustainability of mining practices in Zambia and the Democratic Republic of Congo, concentrating on the transparency of agreements and regulation, or lack thereof, that contributes to the longevity of mining practices and the livelihoods of local citizens. The current state of public information regarding natural resource extraction in both countries creates questions about state motives and investors' economic incentive, with reciprocal effects of inequality, human rights offenses, and underdevelopment. Applying Wallerstein's world-systems theory, I describe the economic rationale behind global involvement in the region's mining operations and identify potential power imbalances. A comparative study of the trends in each country's public disclosure of mining activities, I use commodity statistics, state reports, and local testimony to analyze levels of sustainable development in communities affected by mining, particularly through means of international investment. In this research, I have found a lack of transparency of mining activities within state-released data in the DRC, with a majority of public data accessed from internationally affiliated research hubs. Zambia, on the other hand, while still not perfect, provides more accessible and transparent documentation of mining activity within the state. With local livelihoods at stake, along with the credibility of mining companies and both states, I hope to emphasize the importance of providing transparent data about mining activities within these resource abundant countries and incentivize participation in accountability initiatives to increase future sustainability of the industry.

**Megan Fox**

**A Joke, Revolutionary, and Gillyweed Expert: Reading a Magical Gender Binary into Harry Potter Through Neville Longbottom**

**Mentor(s):** Giselle Anatol, English

**Contributors:** Jonathan Lamb & Misty Schieberle, English

Throughout the medieval ages and into the early modern era, cultural conceptions of magic developed into two distinct, gendered spheres. Male magic was bookish and scholarly, while female magic was affiliated with nature. This binary can be traced throughout literature, and remains prevalent in the modern day. Harry Potter, the modern epitome of the fantasy genre, is a product of this legacy. By examining Neville Longbottom's changing positionality and character development within the series, I explore how J. K. Rowling both subverts and maintains the gender binary in regards to historical conceptions of magic, providing another lens to explore sexism in contemporary society.



**Lindsey Freihoff**  
**The Imperfections of Book Copies**

**Mentor(s):** Isidro Rivera, Spanish & Portuguese

This research will be a comparative study of the work "Don Quixote" by Miguel de Cervantes. Every edition of a book is a kind of translation from one medium to another. In this project, I will argue that there is no such thing as a perfect book copy, or translation. In order to accomplish this, I will utilize the resources at the Kenneth Spencer Research Library to analyze the Spanish edition of "Don Quixote" by Miguel de Cervantes, which was published in Madrid, Spain in 1605, and I will compare this with the 1617 English version of "Don Quixote" by Miguel de Cervantes, which was published in London, England. I will analyze these book copies to further explain their instability in regards to images, and historical contexts, such as the Spanish Inquisition and the process of publishing complexities before the printing process, and lastly I will further investigate translation complications amongst the different languages.

**Courtney Frets**

**"In Times of Fading Light" (In Zeiten des abnehmenden Lichts) and the German cultural memory of the German Democratic Republic**

**Mentor(s):** Lorie Vanchena, Germanic Languages & Literatures

This research examines the generational novel *In Times of Fading Light* (*In Zeiten des abnehmenden Lichts*) by Eugen Ruge and the role that Real Socialism plays in the post-reunification cultural memory of the German Democratic Republic (GDR). Ruge's novel, which won the German National Book Prize in 2011, follows a family from East Berlin over the course of fifty years, from 1951 to 2001. This study draws on a variety of scholarly monographs and articles about cultural memory, written by psychologists and Germanists, to interpret the theme of Real Socialism within the framework of cultural memory in unified Germany. Prior research on East Germany in cultural memory focuses either on the post-1990 memory of the GDR in a nostalgic sense, "Ostalgie", or the memory of Russian-occupied Germany as "Stasiland" (Stasi refers to the repressive and authoritarian State Security Service in the GDR). Ruge provides a unique and realistic perspective on the everyday-life of GDR citizens, not only because the novel is semi-autobiographical, but also because he explores the GDR in the German cultural memory from the differing viewpoints of his fictional characters. This study is among the first to explore Real Socialism and cultural memory in post-reunification Germany.

**Ryan Fullerton**

**"I Don't Know About This Monkey Business": Students and the Antievolution Movement, 1909-1935**

**Mentor(s):** Jonathan Hagel, History

As Christian fundamentalism gained strength in American political culture at the beginning of the twentieth century, debate sparked over whether or not the theory of evolution should be taught in science classrooms. When John Thomas Scopes was indicted for teaching the theory in Tennessee in 1925 in violation of a recent fundamentalist law, the debate reached the national stage. Yet although the controversy included the voices of politicians, parents, pastors, and many others, the voices of students seemed unheard, even by historians who have since written about this debate. Primary documents telling their story are available, however, and together they display that students in the 1920s were far less in danger of abandoning Christianity because of learning about evolution than fundamentalists proclaimed.

**Joel Gallegos**

**The Use of Discretion in Banking Policy**

**Mentor(s):** Terri Friedline, Social Welfare

**Contributors:** Ashley Williamson

During the Mapping Financial Opportunity project, the research team surveyed hundreds of banks, gathering quantitative and qualitative information. After we realized that there was more to discover, we started to analyze the massive amounts of qualitative data. My research partner and I decided to code the surveys to find any recurring practices in the banks. While the initial source of data came from over-the-phone questionnaires, we transferred the responses to a website called Dedoose. This program helps us code the transcripts, by allowing us to identify and highlight key terms. The bank practices we searched for were mainly about the use of discretion in banking policy and details of services offered. For example, how overdrafts were handled by each and every bank, or a clarification on when customers were charged for certain account features. While coding these themes, we found a large number of instances where bank employees used discretion to make decisions concerning overdrafts. The usage of discretion in situations can often lead to more nuanced communication between the employees and customers, but can also open the door for discrimination. We also discovered that a bank's heavy use of fees can potentially start a cycle of accumulating fees and loss of basic account features. This can be especially hard on low- to moderate-income persons, possibly leading to further discrimination and use of discretion in these tricky situations. This research hopes to identify uses of discretion to highlight instances where it was either beneficial or harmful to the customer.

**Tyler Gartner**

**Russian Intelligence in cyberspace, 2014-2016**

**Mentor(s):** Brian Lagotte, Global & International Studies

This project is a look at Russia's operations in cyber space from 2014-2016. The project will focus on the way Russian intelligence agencies such as the FSB and GRU use cyberspace to help reach Russia's objectives internationally. The project will be based on online research from online sources from both Russia and Western countries. The project will examine how Russian agencies have developed their cyber capabilities over the time the project will examine. The project will also explore how Russian actions in cyberspace are affecting international relations using realist theories to explain Russian actions and Western reactions to cyber operations, and those reactions will contribute to the future of international relations.

**Eilish Gibson**

**Measurement of the structure of the inner tracking detector of the CMS experiment using nuclear interactions**

**Mentor(s):** Phil Baringer, Physics & Astronomy

**Contributors:** Anna Kropivnitskaya & Zach Flowers

The Compact Muon Solenoid (CMS) detector at CERN's Large Hadron Collider (LHC) is a multilayered, complicated machine. Its innermost layer, the tracker system, reconstructs the paths of charged particles that are produced in proton collisions. The charged particles fly through the detector and deposit a small amount of charge in the detector, which is read out as a signal. An algorithm reconstructs the paths of all charged particles that flew through the tracker system. The structure of the CMS inner tracking system has been studied with interactions between hadrons, proton-like particles, and the nuclei of atoms in the detector material. The data come from proton-proton collisions at a center-of-mass energy of 13 TeV recorded in 2015 at the LHC. Secondary interaction points are reconstructed from hadronic interactions with the detector material. Precise positions of the material can be measured from these vertices. In particular, the locations of inactive elements in the tracker system such as the beam pipe, pixel shield, pixel support, and pixel support rails are determined, which were previously unmeasured during data taken conditions. These measurements are important for simulations of detector performance, which are used in data analysis. The CMS detector is being upgraded with a new layer of pixel detectors close to the beam pipe. These measurements of inactive elements will also be important for pixel detector upgrade studies after the CMS detector resumes taking data in June.

**Karynn Glover**

**The relationship between motivational climate and objective performance**

**Mentor(s):** Mary Fry, Health, Sport, & Exercise Sciences

Research in sport psychology has consistently revealed that when individuals perceive a caring and task-involving climate they are more likely to display adaptive motivational responses including higher effort, enjoyment, and persistence. Limited research has examined the relationship between individuals' perceptions of the climate to their objective performance.

Further, though relevant, climate research has not yet been extended to the performing art of marching band. The purpose of this study is to examine the relationship between individuals' perceptions of two distinct climates in a high-step fundamental workshop session and their objective performance (i.e., ability to effectively demonstrate the high-step). High school band members will be randomly assigned to participate in a single session where they are taught the high-step marching technique in either a caring/task-involving or ego-involving climate. Participants in both climate groups will complete pre and post surveys assessing their effort, enjoyment, self-efficacy, and perceptions of the climate. Participants will respond to the measures on the pre-workshop based on their high school band experience, and to the post workshop measures with regard to the high-step workshop. Performance is expected to be positively associated with the participants' perceptions of a caring and task-involving climate within the high step workshop.

**Ricardo Gonzalez**

**Synthesis Of Cyclic Peptides and Expression of EC1 Protein To Study The Binding Affinity**

**Mentor(s):** Teruna J. Siahaan, Pharmaceutical Chemistry

It is a challenge to develop drugs to treat brain diseases because it is difficult to deliver the drugs to the brain due to the Blood Brain Barrier (BBB). The BBB is membrane made of brain endothelial cells connected by intercellular junctions used to block foreign substances such as toxins and bacteria, but still allow key nutrient to pass by. We have developed several BBB modulating peptides including ADTC5 (Cyclo(1,7)Ac-CDTPPVC-NH<sub>2</sub>), HAV6, cHAVc3, which modulates cadherin-cadherin interactions in the adherens junctions in BBB to enhance the in vivo brain delivery of different paracellular marker molecules. In this study, novel cyclic peptides will be synthesized to modulate the E-cadherin interactions in the BBB. The peptides have been synthesis using solid phase peptide synthesis technique using Fmoc-Chemistry in a peptide synthesizer. The finished product is a linear peptide, which is then cyclized, then purified using High Performance Liquid Chromatography (HPLC). To confirm the peptides identity, its mass is determined using mass spectrometry. The E-Cadherin consist of 5 extracellular domains (EC 1-5), a transmembrane domain, and a cytoplasmic domain. Using BL21 *E. coli* cells, <sup>15</sup>N labeled EC1 protein domain is expressed and purified and the <sup>15</sup>N Labeled protein allows the use of NMR spectroscopy, TOCSY and NOESY to investigated to obtain insight on the structure and binding affinity between the novel peptides and the EC1 protein.



**Calista Gorrell**  
**Dallas Museum of Underground Arts**

**Mentor(s):** Kapila D. Silva, Architecture

The goal for this museum design was to represent the underground artists and their art in a way that epitomized their unassigned identity. These artists have built up an air of mystery around their community because they strive to remain invisible. Their galleries and studios are hidden in plain sight making it an inclusive scene. You may spot an unmarked, seemingly vacant store front in a strip mall on your drive every day, and not realize it is a gallery. As physical expressions of the ideals of underground art culture, the key architectural ideas of the museum emphasize the unassuming first impression of the structure from people passing by and the incorporation of hidden and unexpected elements. The site selected adjoins the main spine of the Dallas Arts District. The museum is conceived as a network of underground gallery spaces, with two building volumes extruded above ground which have no windows – a sort of muted expression. Only one entry to the building directly off the spine of the District controls foot traffic to and around the museum. Use of a poured in place method of concrete construction allows to leave the surfaces exposed and unfinished on the exterior as well as the interior. Designing a façade without windows and keeping doors carefully near the back of the site created a non-communicative “faceless” building. In keeping the two building volumes ambiguous or “faceless” but differentiated from each other, one volume, which has the main entry, is partially encased in double layered channel glass while the other is exposed concrete. With the intervention of light wells placed strategically through the museum, underground spaces are lit with natural light.

**Zachary Green**

**Early Steps of Alzheimer's Disease Prevention: Exploring Functional Regulation in Healthy Older Adults**

**Mentor(s):** David K. Johnson, Psychology

Declines in physical and mental health in American seniors causes significant disability and loss of functional independence; this loss of independence can result in a heavy societal and economic burden. These declines are worsened by diseases like Alzheimer's Disease (AD). AD causes an extreme acceleration of health decline in age. A great need exists to develop early interventions for the young-old to maximize cognitive and physical function, preserve independence, and address the increasing prevalence of AD.

As America ages, it becomes necessary to explore the cognitive-behavioral building blocks of physical health and psychological well-being in aging. Development of a rational assessment strategy able to predict future risk will allow for more comprehensive planning to reduce functional loss and disability. To this goal, one may ask, "What makes a healthy senior – healthy?". We propose to use a well-understood battery of the cognitive components in executive functioning to predict processes of self-regulation, which may contribute to physical health and psychological well-being.

Secondly, understanding the susceptibility of individuals to cognitive decline is difficult, as there are a variety of factors that may contribute protective or risk-inducing effects. For example, Hispanics, both in the U.S. and Latin America, are disproportionately affected by Alzheimer's Disease. Better understanding the contributing factors to cognitive decline could contribute to designing more effective prevention strategies, particularly in the developing world. We intend to examine different components of lifestyle and their relationship to risk of cognitive decline in both healthy and pathological aging.

**Patrick Griffin**  
**Museum of Agnotology**

**Mentor(s):** Kapila D. Silva, Architecture

Agnotology is the study of ignorance on a social level, how ideas pass like an organism between people and are not always purely truthful. Climate change, the five second rule, white privilege, racism, that we only use 10% of our brains. A museum which challenges ignorance must do so with the tools that people use to sell a lie, a magic trick, or simply convince someone of the lie that you believe. In order to do this in a building, ignorance must be established from the start of the relationship between the visitor and the space. A perfect parallel for this is the iceberg, in which 90% of the volume lies invisible below the surface. A building would express the notion of ignorance in the same way, by hiding most of its volume below the surface. At the same time, any successful building must have a presence, otherwise there can be no economic prosperity for whatever it is home to. The challenge then is an 'invisible building' that has a presence in an urban fabric, and is completely considerate of the environment. The site chosen is immediately adjacent to a flourishing park (Kylde Warren Park) in Dallas, TX. The museum easily acts as an expansion to this park. On the surface, its design acts as a park and water garden; under the water would be glass reveal moments allowing light into the submerged building and giving people a view of those on the surface looking in, but not a view of the people inside looking out. The plan developed in parallel with this idea, taking many different variations but consistently keeping a handful of moments I wanted to achieve. The building, first and foremost, ramps down into a final deep space which would tell the story of the changing distance between a visitor and the surface; this acts as a metaphor for the distance between them and their ignorance; the further they push the greater it is evident. There are moments where people would break out of this winding path into a space where they could see others inside the museum. This space would have water cascading down into it, and the water would land in a space covering a final gallery, which is invisible to those standing outside the path. The final gallery is a transparent space covered with water, giving the people inside a view of those above, acting as a third moment of reveal for ignorance throughout the museum. Ultimately a viewer is ignorant of the volume and approaches to reveal the space. They are then ignorant of the path ahead, and push further down the ramp to reveal more. Finally they are ignorant of the last gallery which they are shown many times but do not see. It is this repetition which acts as a teaching mechanism for reflection in one's own life, hopefully to expose truth.

**Juliana Hacker**

**Phase-out of Nuclear Energy: Good or Bad?**

**Mentor(s):** Lorie Vanchena, Germanic Languages & Literatures

This research project discusses the controversial nuclear phase-out occurring in Germany and proves that although this phase-out creates many economic challenges for Germany, like job loss, the environmental and health benefits of not having nuclear energy out-weigh the challenges. To form my argument and show me the multiple sides of this contentious debate, I read multiple academic journal articles, news articles and websites. Germany has a long history of being anti-nuclear energy. In 2001 as part of the "Energiewende", Germany's transition from nuclear and fossil fuel energy to renewable energy, Germany passed its first nuclear phase-out law, the Atomic Energy Act, which set dates for shutting down several nuclear power plants. An extension was given in 2010 for eight more years, but when the earthquake and tsunami in Fukushima, Japan occurred, German Chancellor, Angela Merkel, quickly made the decision to void the extension and shut down eight nuclear power plants by the year 2022. The suddenness and reversal of this decision to no longer extend the lifespan of the nuclear power plants sparked a debate throughout the country. As history has shown, a nuclear disaster has horrible environmental and health effects, which often cause cancer, but the phasing out of nuclear energy leaves the country facing many business challenges. Only time will tell, if Germany has made the right decision.

**Haven Harbert**

**How Heteronormative Stereotypes Build a Framework for Kink and Fetish Participants**

**Mentor(s):** Jenna Lyons, American Studies

This paper examines the effects of female gender stereotypes within a large societal sphere and how they carry over into a smaller communal arena. In everyday society, people assign roles to gender and create stereotypes. Within the larger everyday society, stereotypes will carry over into sub cultures. A specific sub culture that puts emphasis on gender stereotypes are local kink and fetish communities. Because there is an overlapping theme of gender stereotypes, specifically female stereotypes and stigmas, it is important to note the effects of them within the sub communities of kink and fetish lifestyles to help said communities create better educated and safe spaces for members to have a sex-positive experience. The importance of this research is essential to kink and fetish communities as well as an everyday life. With this research it breaks down areas of taboo within one community while also creating a better educational environment for the kink and fetish community. In hopes of this research having a positive effect within the kink community, it could impact the diversity and knowledge displayed for participants of the lifestyle. As an overall approach to the collection of data, I plan to use qualitative data. My reason behind this is that the research is based off of people's thoughts, morals, and ideals. The specific methodology that is used with this research are oral interviews with participants within the kink community as well as participant observation.

**Sekou Hayes**  
**Dallas Pride Museum**

**Mentor(s):** Kapila D. Silva, Architecture

This design studio investigated how to create a museum typology that narrates the experience of an American subculture through formal design, spatial programming, materiality, and urban contextual relations. For this design investigation, I chose the LGBTQ community. The museum narrates how politics and art created an intersection for queer visibility since its activism came into fruition in the early 1970's.

The intersection between politics and art not only shows the solidarity with community through activism and creative expression, but it also showcases the complexities of issues the community faces. Creating a space that narrates the experience of queer identities in America means critically accessing the full of their experience in America. The LGBTQ community has been known for their flamboyance, vibrancy, and defiance of normality. These very characteristics make them targets of social scrutiny, defamation, and murder. Being a part of the LGBTQ community and often times engaging in the discourse, I have notice a recurring pattern of frustration. This pattern of frustration stems from a lack of understanding and acknowledgment of the integral struggle the community instills in spite of the pride. This is often a perpetuation by members outside of the community. The most viable solution to address this issue, architecturally, is by educating visitors through conscientious, programmatic design. The design task was then how one can make a space that not only serves as a celebratory landmark for the LGBTQ community of Dallas, but also create a space that educates people outside of the community on the complexities of the queer experience in America.

A site located within the predominantly LGBTQ neighborhood in Dallas and that adjoins the route of the annual Dallas Pride Parade was selected. The design brings the parade route into the site and allows it to run through the site back into the streets. A large social gathering space at the ground level of the museum provides a celebratory pause for the parade. The museum is raised above the space, but is accessible from above and below with a central lobby cum atrium space. The program of the museum is divided into three levels: entry level, displaying the beginnings of LGBTQ movement in America; the second level displaying the struggle of the community; and the topmost level with the 'pride' gallery celebrating the achievement of the community. The curvy form of the museum is shaped in such a way to maximize the visibility of the building. The

glazed skin of the building is an iridescent reflective surface that showcases the original colors of the pride flag.

**Francesca Haynes**  
**Asexuality and Hookup Culture**

**Mentor(s):** Ivery Goldstein, American Studies and Women, Gender, and Sexuality Studies

Asexuality holds a unique position amongst other sexualities, and my research will explore this position in the context of hookup culture. For my paper, I define asexuality as a lack of sexual attraction (Bogaert 2015), and a hookup as a casual sexual relationship between people who are not romantic/dating partners (Garcia et al., 2012). However, when choosing research participants, I included people who self identified as asexual rather than selecting people based only on my chosen definition. Prior research focuses on defining asexuality and increasing visibility for asexual people (Bogaert 2015, Chasin 2015, Yule 2015), but I plan to go beyond this and learn more about the personal experiences of asexual people in romantic and sexual relationships. This is important because regardless of the potential reification of asexuality or the importance of asexuality gaining visibility, if we do not understand asexuality at a deeper, more complex level, none of that information will be all that useful. In fact, without a more complex understanding of asexuality, we may overlook important aspects of it. I will use feminist ethnographic techniques (Buch, 2014), specifically one focus group and a handful of interviews to learn more about the asexual experience. I hope to discover how asexual people navigate hypersexualized dating apps, casual sex, and romantic relationships. I will use the data I collect to find ways that our culture could be more inclusive of asexual people and their experiences.



**Malkie Menatillak and Yasmin Herdoiza**

**What Factors Affect Our Emotional Reactions to Recalling Negative Memories?**

**Mentor(s):** Andrea Greenhoot, Psychology

**Contributors:** Robyn Kelton

For most people, thinking about stressful memories prompts negative emotions, but the nature and intensity of their emotional reactions likely depends on many factors. This study looked at changes over time in how people feel after recalling their negative memories, and whether those changes are related to the conditions of recall, personal characteristics, and memory characteristics. Participants recalled three negative memories in one of two randomly-assigned conditions: an Audience condition, in which participants recalled to a researcher, and a No Audience condition, in which participants recalled their memories into a microphone with the researcher in the next room. All memories were audio-recorded for analysis. After each memory, participants filled out a questionnaire regarding their levels of post-recall positive and negative emotion and their history of sharing the memory. They also completed measures of depressive symptoms and life satisfaction. Participants returned to the lab 12 to 24 days later for a follow-up appointment. All participants again recalled three negative memories (without an audience) and were then prompted to individually recall any Time 1 memories they had not already recalled at Time 2. Participants filled out the same questionnaires after each memory. Analyses will examine whether there are significant differences in positive and negative feelings reported between initial and follow-up recall. Based on previous research, we expect to see a significant decline in negative feelings reported after the follow-up recall. Additional analyses will look at how changes in affect are related to the audience manipulation, memory sharing, and measures of mental health.

**Jeffery Heppler**

**Cuban Agriculture: Insights and Applications to U.S. Policy and Practice**

**Mentor(s):** Paul Stock, Sociology and Environmental Studies

**Contributors:** Tim Hossler, Environmental Studies

Cuban farming has been in the spotlight ever since the complete transformation of their agricultural sector. Decades prior to the collapse of the Soviet Union, Cuba heavily invested in industrial agriculture, namely sugar. The subsequent Special Period (El Periodo Especial) was defined by scarcity of oil and food. Lack of cheap oil and other imports left Cubans to farm and feed themselves. In response, universities and institutions developed curriculum in agroecology. Individuals, organizations and cooperatives emerged to disseminate traditional and novel knowledge. The government turned over lands of large state-owned farms and abandoned lands to those willing to grow food for the general population. It was a movement of every segment of society out of necessity. My visit to Cuba in January of this year gave me valuable insights into the differences and similarities of how we grow food in the United States. With this research, I seek to comparatively examine how Cuban and U.S. government, organizations, and individuals influence agricultural policy and practice. Three entities from each country are coupled to illustrate this. Unless there is cooperation to alter our current food system from all levels and breadths of society, nothing will change short of collapse. History has taught the Cubans to work with what they have in order to thrive. Is adversity required for us to do the same?

**Andres Hernandez Guerra**

**Target Location Using Ultrasonic Radar Systems**

**Mentor(s):** Christopher Allen, Electrical Engineering & Computer Science

Use ultrasonic signals for target detection and ranging. This project focuses on applying the ultrasonic frequency spectrum to transmit and receive ultrasonic signals for the purpose of detection, ranging, and positioning resolution. The end objective of this project is to refine the algorithm created for detection of the angle of the arriving signal in order to adapt it to UAVs for autonomous flying. The project was started by measuring the azimuth angle of the signal incoming to the microphone from the speaker when they are both on opposite sides, facing each other, at a fixed distance. Thereafter, a program on MATLAB was constructed to analyze the signals obtained through a 200MHz oscilloscope, and calculate the azimuth angle of the incoming signal and the power of the same. From this point, measurements will be taken with variations of mechanical angle,  $\Delta\theta_m$ , of + 5 degrees and obtain a plot of mechanical angle vs. calculated angle. With the information gathered, a plot of power vs mechanical angle will also be generated for comparison. The project is currently still in progress.

**Sean Herrmann**

**Museum for Cultural Environmentalism**

**Mentor(s):** Kapila D. Silva, Architecture

The Art District of Dallas, TX is host to a great number of renowned museums which promote social and cultural diversity in the greater metropolitan area. To further encourage awareness and activism, the Dallas Arts District Foundation seeks to build a Museum for Cultural Environmentalism. While the main purpose of the museum is to promote awareness of the impact humans have on Earth, exhibits will also feature prominent environmentalist movements and cultures throughout the United States. Additionally, the museum will stand as a prime example of how the built and natural environments can co-exist harmoniously in bustling urban surroundings. Located across the street from famous Klyde Warren Park, the Museum emerges from the earth in a series of staggered wedge shapes. The form of the building stems from sunlight availability on the site, maximizing access to natural daylight. Sustainable plant pods cover a significant portion of the building's façade, while a large, south-facing sloped roof is covered in plants native to the area. A reflecting pool at the base of the building's slope holds rainwater collected on site, in addition to utilizing evapotranspiration to keep the roof greenhouse cool. Unique "didactic" pods – constructed of glulam – provide areas throughout the site for group gathering, informational exhibits, and workshops. Visitors entering the museum are greeted to an expansive three-story atrium. On the ground floor, a café, gift shop, and main exhibition space are available to museum-goers. A suspended central glass stair takes visitors up to the next floor, providing access to educational classrooms, a research library, and interactive exhibits promoting sustainable living. One floor above is additional gallery space, administrative offices, a lounge, and large outdoor patio overlooking the Dallas skyline. As the museum's stand-out feature, visitors journeying to the roof get to experience an expansive greenhouse. With a sweeping glulam and glass canopy, adequate sunlight is provided for each of the four terraces. Rain water is collected from the canopy through an integrated gutter, which is filtered and then used for irrigation purposes. Enhancing the museum's vision as a place for learning and exploration, the greenhouse provides four different soil depths and climate adaptability. This allows curators to create up to three unique ecosystems in close proximity for guests to discover.

**Mitchell Holmes, Chris Lansford, & Evan Jackson**  
**Automotive Demand and Trade Policy**

**Mentor(s):** Myunghyun Oh, Mathematics

**Contributors:** Donna Ginther & Anthony Guy

All automotive manufacturers must ask the question: how many cars need to be produced? Microeconomics dictates that manufacturers will choose a profit-maximizing production strategy. This means there is neither a shortage of cars nor an over supply. The answer is clear then: produce just enough cars. However, it is not that easy. Everyone has a different preference for cars. Moreover, automobiles are made all over the world and, as a result, are subject to international trade agreements. This report will attempt to determine the demand for non-commercial cars given various factors. While tastes and budget constraints are large factors of demand, the major emphasis of this report will be on how trade policy between countries affects automotive demand. To do this, we will expand upon already established demand models for durable goods. Notably, we will use the General Sales Forecast Model for Automobile Markets and Analysis from Ibai publishing in 2012 [1]. To expand upon these models, this report will offer advice on how to parametrize a trade policy, which will be done through econometric methods. Descriptive statistics and time series data from the automotive industry will be used to check and verify our results. Since this report is part of an ongoing project, instead of a conclusion, a hypothesis is offered.

**Ana Huerta**

**Investigating the Role of the Wnt Pathway and Runx Gene on Regeneration in *Nematostella vectensis***

**Mentor(s):** Paulyn Cartwright, Ecology & Evolutionary Biology

Regeneration is the intrinsic ability to regrow damaged or missing anatomical parts of the organism. Understanding regenerative mechanisms can potentially lead to insight for treatment of humans who have suffered cell damage due to aging, disease, or trauma. The sea anemone *Nematostella*, has the ability to fully regenerate amputated body parts, and is an excellent model for regeneration experiments. After bisecting the polyp, *Nematostella* will completely regenerate its missing half within a few days. The canonical Wnt Pathway is an important signaling pathway that is conserved amongst all animals, and plays a key role in axial patterning. The Runx gene, is also conserved and thought to play a role in regulating cell division during differentiation. We used two pharmacological agents, an inhibitor of the catenin-responsive transcription factor of the Wnt pathway iCRT, and an inhibitor of Runx, Ro5-3335 to investigate the role of the Wnt pathway and Runx on regeneration. We observed iCRT delayed regeneration activities, and Ro5-3335 had no effect on the period of regeneration. Thus it appears that the Wnt pathway, but not the Runx gene, plays an important role in *Nematostella* regeneration.

**Caroline Huff**  
**Digitalization of Incunabula**

**Mentor(s):** Lorie Vanchena, Germanic Languages & Literatures and Isidro Rivera, Spanish & Portuguese

This research analyzes the study of incunabula, books printed between 1454 and 1500, and the effect digitalization has on the study of such artifacts. With the progression of the digital age, the study of incunabula has become available to a wider public. High quality images can be as valuable as physical copies when taken correctly. Currently, the Bayerische Staatsbibliothek in Munich has the largest collection of incunabula and is working to completely digitalize these volumes, as are many other libraries. This study analyzed the digitalization of two books, *De civitate dei*. Comm and *Vitae illustrium virorum*, by four libraries – the Bayerische Staatsbibliothek, the Thüringer Universität und Landesbibliothek Jena, the Bibliotheque Mazarine in Paris, and the Biblioteca Nazionale Marciana in Venice – and compared these electronic facsimiles with physical copies held by the Kenneth Spencer Research Library at the University of Kansas. Our study found that the online images produced by these libraries are equivalent to physical copies. The book in its entirety was provided, and it showed accurate sizing as well as being true to the original colors. This research is important because it demonstrates that online images can be an adequate substitute for physical copies when surveying and analyzing incunabula. With fully digitalized incunabula, researchers will be able to study more incunabula from different parts of the world without having to worry about travel expenses. It will also better preserve fragile copies, as they can be studied without having to be touched.

**Eli Hymson**

**Gender Disparities in Debate: How Gender Interactions Influence Subjective Competitor Evaluations**

**Mentor(s):** David Slusky, Economics

This paper uses tournament registration data to examine how gender interactions between competitors, opponents, and judges contribute to the male-female achievement gap in competitive high school debate. Using panel data spanning seven years and over 130 tournaments, I isolate differential outcomes in subjective evaluations for female competitors contingent on the genders of their judge and opponent. In all specifications, female competitors perform significantly worse than male competitors in subjective measures with a male judge and/or opponent, but no worse with both a female judge and opponent. Holding opponent gender constant reveals an insignificant improvement in performance with a female judge versus with a male judge. Holding judge gender constant reveals a significant improvement in performance with a female opponent versus with a male opponent. The findings suggest a lack of evidence that judges are inherently biased against female debaters, but raise questions about how expectations of gender traits frame male-female interactions and how they are perceived. Because subjective evaluations influence long-term competitive success, understanding the criteria by which they are decided should prove useful in formulating strategies to promote inclusivity and fairness in the activity.



**Heather Jackson, Jennifer Boyce, Sarah Kuckelman, Ryan Primovic**  
**Levels of Arousal in Non-Depressed Individuals During Mood Alteration**

**Mentor(s):** Evangelia G. Chrysikou, Psychology

The objective of the current study was to determine the differences in arousal levels between non-depressed individuals who had undergone mood alteration via the Musical Mood Induction Procedure (MMIP) and those who had not, in order to determine whether non-depressed individuals placed in a negative mood respond similarly to clinically depressed individuals. More specifically, it was hypothesized that those in the MMIP condition would have decreased levels of arousal to positive stimuli and increased arousal levels to negative stimuli. Electrodermal responses and electrocardiography were used as physiological measures of arousal, while the Brief Mood Introspection Survey (BMIS) was used to capture mood. The results showed that those in the MMIP condition had significantly higher scores on the BMIS, implying that the negative mood alteration was successful. This group also showed significantly higher levels of arousal for both positive and negative stimuli. Further research is necessary to examine arousal levels directly between depressed and non-depressed individuals.

**Keywords:** arousal, MMIP, electrodermal response, electrocardiography, mood alteration

**Jazmine Jefferson**

**Muon Efficiency Study with Tag and Probe Tool at CMS experiment**

**Mentor(s):** Philip Baringer, Physics & Astronomy

**Contributors:** Anna Kropivniskaya

The Compact Muon Solenoid (CMS) is a detector built for the Large Hadron Collider (LHC) at CERN. As the name suggests, the identification of muons is one of the most important tasks for CMS, though it is designed to operate for a wide range of physics applications. The efficiency of muon identification is calculated using a tag and probe method. This method is utilized through identifying a “tag” muon which satisfies a certain tight criteria and pairing it with another muon candidate, or “probe,” that satisfies looser criteria. To obtain the most precise measurements, tags with passing and failing probes are then compared to calculate an efficiency, which involves corrections to Monte Carlo simulations using real data. Data come from proton-proton collisions at a center-of-mass energy of 13 TeV recorded in 2016 at the CERN LHC.

**Zachary Kelsay**

**Varying Experiences in the Cuban Dual-Currency System**

**Mentor(s):** Jennifer Foster, Spanish & Portuguese

**Contributors:** Jeremy Barclay

During the winter 2016-2017, I conducted research regarding the Cuban Economy, with a focus on the Cuban Dual-Currency system. This research was significant because Cuba is the only country in the world with two domestic currencies. At present, there exists no quantitative data or testimony from Cuban citizens since 1998. Furthermore, research focusing solely on the Cuban dual-currency system has never been documented.

I carried out my research goal by conducting on-the-ground interviews with Cuban citizens and entrepreneurs in the private sector. Additionally, I collected price points from over one-hundred Cuban shops and businesses in three different cities to compare interactions between the two currencies and Cuban citizens. I discovered differences in the way individuals interacted with the currency market depending on their location. Additionally, I found instances in which individuals made efforts to integrate the two systems for the sake of convenience and to reduce transaction costs. In other words, some completely disregarded laws and regulations by treating the Cuban Convertible Peso as a higher-valued denomination of Moneda Nacional to save time exchanging at Cuban banks.

**Amir Khaleghi**

**The Effect of Religious Affiliation on Charitable Donation**

**Mentor(s):** Donna Ginther, Economics

This study examined the effect of religious affiliation on charitable donations. Specifically, whether religiously affiliated individuals donated more than those who are nonreligious. Most prominent religions promote altruistic behaviors, such as donation, but do the practitioners reflect this behavior? Results obtained by hierarchical regressions will aim to answer whether a religiously affiliated individual donates more than those who are nonreligious. The hypothesis is that if an individual is religiously affiliated then they will donate more than those who are nonreligious. Data was gathered from the cross-panel study of income dynamics (PSID), which is conducted yearly by the University of Michigan. Regressions examined the data to determine the effect of religious affiliation donation amounts while controlling for gender, race, religion, age, education, employment and marital status, number of children and frequency of religious attendance. Two separate regressions were run to observe the effect of religious affiliation on both non-religious and all charitable donations. Results showed that religious affiliation effected charitable donations when all charities were included; but when specifically looking at non-religious charities, religious affiliation had no effect.

**Sarah King**

**Sex, Alcohol, and Gender: College Students' Attitudes and Opinions About Sexual Consent as a Function of Gender and Level of Intoxication**

**Mentor(s):** Charlene Muehlenhard, Psychology

**Contributors:** Brittany Brower & Daniel Whedon

In 2013, two extremely intoxicated Occidental College students had mutually initiated sex. Subsequently, "John" was expelled for having sex with "Jane" while she was incapacitated. "John" then sued the College, alleging gender discrimination.

Universities are emphasizing sexual consent, but consent can become complicated when alcohol is involved. Furthermore, some people conceptualize consent as gendered, regarding men as responsible for obtaining women's consent, but not vice versa.

In this study, we investigated students' attitudes about sexual consent in heterosexual encounters when one of the individuals involved is intoxicated.

**METHOD:**

Introductory psychology students completed an online survey. Participants were randomly assigned to read one of four scenarios about two students who engaged in mutually initiated sex. This presentation will focus on the two scenarios in which one of the students—either the woman or the man—was intoxicated, and the other was sober. Participants were asked open- and closed-ended questions about the scenario, including whether each student had consented and who was responsible for getting consent. We currently have data from 185 respondents.

**RESULTS:**

Analyses are underway. We are investigating the following questions:

- Do participants' opinions vary depending on the gender of the intoxicated student?
- Does participant gender interact with the gender of the intoxicated student?
- What themes are present in participants' qualitative responses?

**CONCLUSION:**

This study will help us understand college students' attitudes and opinions about sexual consent as a function of gender and level of intoxication. These results could inform future educational programs and university policies.

**Zoe Lai**

**Patient outcomes with an iPad application for home-based therapy of chronic low back pain**

**Mentor(s):** Brittany Melton, Pharmacy

**Objective:** To test an iPad application with exercise training and pain education videos for home-based therapy of chronic low back pain (LBP).

**Design:** Participants with chronic LBP were provided an iPad with exercise training and pain education videos to complete 3 sessions a week of home-base therapy for 6 weeks. The application educated patients on pain physiology, fear avoidance, exercises, and pain management options. Participants completed a series of questionnaires before, during, and after the program to assess changes in fear avoidance and pain control through a secure data collection portal. At the end of the program participants were asked to complete telemedicine and Computer System Usability (CSUQ) questionnaires to assess program usability. Three months after program completion, a follow-up call was conducted. Descriptive statistics and paired t-tests were used to evaluate participant improvements in pain, fear, and perceptions.

**Results:** Thirteen adults enrolled in the study. Participants were mostly satisfied with the iPad application, and had a significant reduction in pain ( $p=0.019$ ) after completing the program. Subsequently, participants also reported a significant reduction in fear of physical activity ( $p=0.047$ ). Most participants agreed that the program made health care services easier to access (67%), and was more cost efficient compared to the normal physical therapy visit (83%).

**Conclusion:** The iPad application for home-based therapy of chronic LBP is useful and effective in improving participants' pain management. Participants were satisfied with the accessibility and affordability of the program compared to standard in-person physical therapy.

**Sarah Langtry**  
**The Evolution of Print**

**Mentor(s):** Isidro Rivera, Spanish & Portuguese

**Contributors:** Eric Alder

This project will develop ideas related to the evolution of print culture throughout history while specifically focusing on different editions of "Carcel de amor" by Diego de San Pedro. The presentation will explain the differences in each edition in their relation to the ever changing culture, technology, and socio-economics when it was printed. It will also focus on bibliographic changes to each book copy. For example, the images within each copy will be examined in relation to these factors. The difference between modern and older copies of the book will also be highlighted.

**Jessica Larson**

**Gender, Race, Erasure and the Ethics of Broadcast News Coverage:  
A Case Study on the Orlando Nightclub Shooting**

**Mentor(s):** Jenna Lyons, Women, Gender, and Sexuality Studies

This is a case study of ideology, neoliberalism and the constraints of fair and honest reporting in the broadcast news industry. It focuses on the five day news cycle immediately following the Orlando Pulse Nightclub shooting on June 16, 2016. Research samples segments from right-leaning Fox's The O'Reilly Factor and moderate to left-leaning CNN's Anderson Cooper 360. The identity politics, representation, and structural analysis aspects of reporting are critically examined with Critical Race Theory methodology. Findings argue the two outlets are separately constrained ideologically in their ability to consider the nuances of how traumatic events affect differing identities, committing perpetual erasure at differing degrees. It also argues these organizations share a gap in covering race and gender involved-breaking news stories on a structural level, such as looking to how systemically ingrained homophobia influenced the Orlando shooting. In my conclusion, I examine how the news industry can move towards more accurate and inclusive reporting.



**Jeremy Lippman**

**The Examination of Possible Sex-related Differences in Properties of Motor Units**

**Mentor(s):** Trent Herda, Health, Sport, & Exercise Sciences

**PURPOSE:** The purpose of this study was to examine possible differences in motor unit (MU) firing rates and size between men and women. **METHODS:** Six men ( $19.5 \pm 0.84$  yrs) and six women ( $22.2 \pm 3.2$  yrs) performed isometric contractions at 70% of maximal voluntary contraction (MVC). Electromyography (EMG) sensors were placed on the right vastus lateralis (VL). EMG signals recorded during the contraction were decomposed into MU action potential trains to measure MU sizes (MUAPSIZE, mV) and mean firing rates (MFR, pulses per second [pps]) in relation to recruitment threshold (RT, %MVC). Slopes and y-intercepts were calculated for the MUAPSIZE vs RT and MFR vs MUAPSIZE relationships for each subject. Ultrasound images were taken to measure the cross-sectional area (CSA) and echo-intensity (EI), a measure of intramuscular fat, of the VL. Independent samples t-tests were used to measure possible sex-related differences between CSA, EI, and the y-intercepts and slopes between sexes. **RESULTS:** There were differences in the slopes of the MUAPSIZE vs RT ( $p=0.009$ , women= $0.0026$  mV/%MVC, men= $0.0052$  mV/%MVC) and the slopes of the MFR vs MUAPSIZE relationships ( $p=0.006$ , women= $-71.0$  pps/mV, men =  $-47.7$  pps/mV) with no differences in the y-intercepts for either relationship ( $p>0.05$ ). CSA ( $p=.017$ , women= $15.0$  cm<sup>2</sup>, men= $23.1$  cm<sup>2</sup>) and EI ( $p=0.001$ , women= $129.8$  AU, men= $76.0$  AU) were different between sexes. **CONCLUSION:** Men displayed larger higher-threshold MUs in comparison to women, which is supported by the greater lean muscle area (greater CSA, lower EI) reported via the ultrasound images. In addition, the larger higher-threshold MUs for men had greater firing rates in comparison to women.

**Mark Livingston**

**How environmental differences affect the relationship between masculinity and violence**

**Mentor(s):** Jenna Lyons, Women, Gender, & Sexuality Studies

This paper examines the relationship between masculinity and violence and how factors such as environment affect their intertwining understanding. A common trend has been found between masculinity and violence, primarily in the sense that the assertion of physical harm leads to self-improved notions of masculine attitudes. However, how this relationship is affected by external forces such as a rural or urban environments. By adopting previous research done on both the subjects of masculinity and violence, this paper establishes the ties between the two and the intersectionality which occurs in their relationship. By then cross examining them with crime reports of both rural and urban settings, the repeated relationship between these two factors are weighed based on the social communities which house these environments. Factors such as religious importance, income and race are all accounted for in determining how these settings affect the relationship. While taking into account oral histories from participants which come from a variety of urban versus rural settings, these examinations help pinpoint direct links between one's community and their ties to importance to masculinity.

**Michael Long**

**A Highly Efficient Protocol for CRISPR Mutagenesis in *Drosophila virilis***

**Mentor(s):** Justin Blumenstiel, Ecology and Evolutionary Biology

The CRISPR/Cas-9 protein complex is a genome editing system that was recently discovered and is expediting genetics research. The CRISPR/Cas-9 complex houses a guideRNA and the Cas-9 nuclease, which allows it to target a sequence of DNA complementary to the guideRNA, within a living organism, and cleave it within the nuclease. Thus, we are able to alter the genomes of living organisms. This has allowed genetics research to take a giant step forward. Using this method, we generated a stock of white-eyed *Drosophila virilis*. We introduced three lesions in the gene *white*, which allowed us to visualize the success of our Cas-9 complex based on eye color. From there, crossing schemes were set up to isolate individual white mutations and generate various stocks of white-eyed strain 9 *Drosophila virilis*. Previous studies have demonstrated that transposable elements play a role in offspring sterility, and that p53 is responsible for apoptosis in the germline. So, using the developed white-eyed mutants as a background, a CRISPR-guided introduction of fluorescent protein within the p53 gene will be visualized under various conditions of fertility to understand its role in sterility.

**Jessica Lovett**

**Cliché Queens: An Analysis of the Usage of Feminine Stereotypes in RuPaul's Drag Race**

**Mentor(s):** Ivery Goldstein, Women, Gender, & Sexuality Studies

The ways in which drag performances represent understandings of gender has been a topic of interest in the research world for many years. Existing scholarship in general seems to concede that the hyperbolized expressions of gender within drag performance encourage a more fluid approach to gender by calling attention to the strict limitations imposed by the gender binary. On the surface, this may ring true, as the very nature of drag performance involves expressing oneself beyond one's biologically assigned category. I argue that this involves further investigation, especially with regard to the ways in which femininity is represented. This study analyzes feminine representations within drag performance, specifically examining the use of stereotypes or tropes. Its goal is to increase understandings of how femininity is understood and navigated within this context, and ultimately, how it may impact the understanding of viewers. The method for collecting data for this project involves the analysis of media content. Episodes from the most recent full season of the widely viewed and celebrated RuPaul's Drag Race (season eight) will be examined in order to reveal the usage of feminine stereotypes or tropes, which will then contribute to the discussion about potential implications these representations may have on viewers in broader context. Despite discourse arguing that drag performers draw attention to the ridiculousness of hyperbolized expressions of gender and promote gender fluidity, I argue that representations of femininity, specifically the usage of feminine stereotypes, may contribute to the rigid dichotomy imposed by the hegemonic gender binary.

**Billie Lubis**

**X-ray testing of silicon forward pixel modules**

**Mentor(s):** Alice Bean, Physics & Astronomy

The Compact Muon Solenoid (CMS) is a particle detector located at the Large Hadron Collider in Geneva, Switzerland. Inside, protons collide with each other at very high velocities and produce showers of smaller particles, whose paths can be traced through the detector. The University of Kansas CMS group has been testing parts for an upgrade of the tracker, the innermost layer of the CMS detector, for more than two years. For this upgrade, new silicon detector modules were constructed, tested, and were installed in the CMS tracker beginning in February 2017. The X-ray testing at KU was an integral part of this testing process.

The KU CMS group has tested over 300 silicon forward pixel modules for the upgrade of the tracker. We used x-rays to provide a high rate of particles, similar to particles the modules might see in the CMS, and tested the efficiency of each module. We also calibrated the energy of the modules using a technique called fluorescence. Modules were given a grade based on their performance on these tests. For modules that were graded "A" from previous calibration and functionality tests, we downgraded 16% primarily due to findings from the high rate testing.

**Zachary Lundgren**  
**The Museum of Slow Violence**

**Mentor(s):** Kapila D. Silva, Architecture

Slow Violence is a negative phenomenon in which small-scale violent activities occur over a large extent of time, resulting in an accretion of violence over time. Due to their slow and small-scale occurrence, they go unnoticed and unattended by the public, causing situations that are difficult to mitigate or rectified. Some examples of this include deforestation, climate change, and toxic drift. This creative project intended to be a museum that lets its visitors be informed of the notion of slow violence, through both its architecture and exhibits. Located in the Arts District of Dallas, the formal mass of the museum mimics that of the adjoining Nasher Sculpture Center. The main exhibit consists of two types of galleries. One is a 'linear, continuous gallery', which meanders switching back and forth and gradually changes direction to create a sense of disorientation for the visitor. The second type of galleries are 'triangular static galleries' that fill the spaces in-between the continuous gallery, created through the shifts in its directions. These galleries create a fragmentation in the story/ journey, which allows the visitors to analyze a specific event or theme more in depth. Along with the gradual shift in direction, there are several other features in the main continuous gallery that evoke a sense of slow violence. One is the change of grade: the continuous gallery has a consistent slope down, which creates a gradual change of the height of the space, in turn creating an increased experiential tension as visitors move through the gallery. This descent is accentuated with the gradual change of natural light coming from the top through a glass roof, which results in the gallery spaces naturally getting darker as the visitor walks down. Finally, as the visitor descends, the smooth concrete walls found at the start of the gallery begins to become rough and less pleasant to the touch. The continuous gallery leads into the final gallery space, a very dark voluminous space, in which the natural light from the ceiling is completely cut off. This exhibit is representational of the point of 'no return' for a slow violent event. Visitors then walk through this last exhibit to an elevator, which is located on the axial center on which the galleries are pivoted. This then takes visitors back up to the ground level and opens up to a viewing gallery, which gives a panoramic view of all of the continuous gallery at once and of the journey one has just gone through. This space provides a sense of transparency and reflection for the visitor.

**Joshua Lutz**

**Government Desegregation: A Failure to Effectively Desegregate the Kansas City Missouri Schools**

**Mentor(s):** Jonathan Hagel, History

This research examines how the Kansas City Missouri schools changed and held steadfast in the eyes of desegregation. This research focuses on the court case Missouri V. Jenkins brought forth in 1977 stating that the Kansas City school district was not desegregated due to its failure to meet the National desegregation standards. An area of explanation this research examines is how segregation in the U.S. changed following the Civil Rights movement. From the sources found and the interview conducted it became evident that race became a secondary factor, if one at all, instead the segregation became one of economic class. Essentially segregation of the haves and the have-nots. The research points towards a failed desegregation policy because the government was not able to tell parents they could not pay money to send their children to private schools, or determine whether parents would move to a new school district to avoid the busing policies. Finally, this research examined the magnet school plan that resulted from the Missouri V. Jenkins case, and found that the magnet schools have failed to achieve their goal of willingly drawing students back to the Kansas City Missouri public schools.

**Murphy Maiden**

**Queering Protections: How Policies and Resource Allocations Shape Queer, Transgender, and Gender Non-Conforming Student Experiences on the University of Kansas Lawrence Campus**

**Mentor(s):** Sherrie Tucker, American Studies

Which students does the University of Kansas and its state promote to their fullest? Though this question has no finite answer, it invites us to question students' senses of belonging in the university environment. Lesbian, Gay, Bisexual, Transgender, Questioning, Intersex, and Asexual (LGBTQIA+) students, to whom I refer as queer, transgender, and gender non-conforming students for cohesion, lie outside of visible and audible narratives in many spaces. In sociopolitical climates similar to Kansas, these students' governments actively strip their rights and resources from them. Without full acknowledgement and support, students isolate, and symptoms of depression or anxiety can foster. To challenge this, queer and transgender student narratives must come to the forefront. To know these students' perspectives of campus and state climates, researchers must ethically interview, seeking insight into lived experiences of often forgotten, and ignored, student populations. My research invites LGBTQIA+ students to recount their stories regarding their gender and sexual identities during their time in Lawrence, Kansas.



**McKinzey Manes**

**Translations of stories from "Priče sa Jaliје" by Hajim S. Davičo**

**Mentor(s):** Stephen M. Dickey, Slavic Languages & Literatures

The short stories of Hajim S. Davičo appear to be the first fictional works to describe the lives of Sephardic Jews in Serbia. Davičo lived in Serbia's capital city of Belgrade and was born fourteen years before Serbia gained independence from the Ottoman Empire at the Congress of Berlin in 1878 (which also gave Jews in Serbia full civil rights). In the years after the Congress of Berlin, many minorities in Serbia began to assimilate more fully into Serbian society. This caused a shift in the identity of Belgrade's Sephardic community, which had previously kept itself fairly insulated from the surrounding society. Davičo's collection of stories *Priče sa Jaliје* (published 1893; in *English Tales from Jaliја*) is set in Jaliја, the Sephardic quarter of Belgrade (the "Lower Dorćol" neighborhood in contemporary Belgrade). Because these stories were written during this cultural shift, themes of Jewish identity and the conflict between changing identities are central to much of the collection. Despite this culturally and ethnographically compelling aspect of Davičo's writings, his works have never been translated into English. This project focuses on the translation of three of the seven short stories that comprise *Tales of Jaliја* over the course of the semester, whereupon the translations will be submitted to journals of literary translation for publication. This project not only extends the voice of Hajim S. Davičo by making his works available to a wider audience, but also enables a better understanding of an important time period for Sephardic Jews living in Serbia.

**Brianna Marsh**

**High plasma levels of protein-methionine sulfoxide may be indicative of Alzheimer's disease.**

**Mentor(s):** Jakob Moskovitz, Pharmacology & Toxicology

**Contributors:** Yue Dang

A reliable blood marker for the diagnosis of Alzheimer's disease (AD) has not yet been discovered. Previously, our lab compared human serum levels of proteins containing methionine sulfoxide (MetO) between subjects with the genetic mutation for familial Alzheimer's disease (FAD) and non-mutation carrying kin. We found a correlation between the presence of the mutation and methionine sulfoxidation in specific serum proteins. In the current experiment, we examined the correlation of plasma MetO-proteins with mild cognitive impairment (MCI) and sporadic AD, compared with non-demented control subjects over 70 years old. Our data showed that an increase of MetO levels in a specific protein in human plasma parallels a decrease in super oxide dismutase (SOD) enzymatic activity only in AD patients (compared to MCI but not control subjects). These observations suggest that significant changes of both plasma MetO protein levels and SOD activity are more specifically associated with AD, rather than with early stages of other forms of dementia. Thus, periodic monitoring of the levels and patterns of these plasma factors in patients displaying MCI may provide a marker for disease progression to an AD state. Further studies are currently underway to identify the detected MetO-containing protein and to expand the study to a larger population.

**Anthony Martin**

**Immediate Effects of the Printing Press**

**Mentor(s):** Isidro Rivera, Spanish & Portuguese

For this presentation I will be focusing on the immediate effects of the printing press. A very brief history of the printing press, its creator and where it was created, will be provided. Following that, the focus will immediately shift toward the results of the press. For the most part, my emphasis will be in the economic and cultural consequences. First, the economic changes will be discussed. A key issue that will be stressed will be the area of influence for the printing press, emphasizing who actually had access to the benefits. Afterwards, the presentation will touch on the subject of which cities would have been prime candidates. When talking about the cities, I will be referring to information such as the location of cities and types of businesses present in the cities. Not only will I be referring to the actual geographic location, in regards to the country, but also the geographic features near the city. For example, it's closeness to open water or whether or not it was a port city. After this, there will be a shift to the cultural effects of the press. Information such as those who were most likely to be benefited by it, the actual usefulness of it, as well as the numerous possibilities created by it will be discussed. Additionally, the potential consequences that the printing press held in regard to class stability will also be talked about.

**Mara McAllister**

**Where are the dads?: Examining the absence of fathers in Early Head Start Home Visiting at Project Eagle**

**Mentor(s):** Ivery Goldstein, American Studies

This paper explores the gender gap in services provided by Project Eagle, an early childhood intervention program located in Kansas City, Kansas. Project Eagle offers parent education for early childhood development through Early Head Start Home Visiting. Using a feminist program evaluation, the author analyzes what factors within the agency are dissuading fathers from seeking services. Demographic information collected from the agency reveal that Project Eagle overwhelmingly serves more women than men. Project Eagle currently employs only women. The theory of the feminization of poverty, scripting theory and various theories related to the depiction of fathers are uniquely applied to the program evaluation as a lens through which father engagement can be analyzed. The researcher used interviews with fathers and mothers receiving services from Project Eagle and social workers working at the agency to reveal that barriers and deterrents to fathers seeking services exist, such as traditional gender roles, lack of male social workers, and lack of understanding from female social workers among others. The research is intended for Project Eagle and agencies like it to utilize in order to make their program inclusive of fathers and promote their engagement and participation.

**Casey McDonald**  
**KU Sports and Title IX**

**Mentor(s):** Ivery Goldstein, Women, Gender, & Sexuality Studies

This project examines how the University of Kansas uses Title IX in different instances of male athletes committing violence or sexual assault against female athletes through news articles sources reporting on these instances and how the victims and perpetrators were/are being treated after the committed crimes. A collection news articles discussing the crimes of sexual assault and violence against the female athletes at KU perpetrated by the male athletes at KU will be used for the research methods. Since Title IX encourages gender equality within academic and athletic programs at the University of Kansas, forbidding hostile environments on the basis of sex, and it forbidding sexual harassment and sexual violence, I argue that the University of Kansas has violated their liability to the Title IX law for minimally punishing the male student-athletes who perpetrated violence and sexual assault against female student athletes and that the University of Kansas has also violated Title IX by unfairly treating the female student athlete victims within occurrences of male athletes committing sexual assault and violent crimes against female athletes at the University of Kansas This project will discuss the role of Title IX in the discrimination and unequal treatment of the victims and perpetrators in multiple instances at the University of Kansas, and this project will also discuss the connections of these instances with the theoretical framework of hegemonic masculinity.

**Stephen McEnery**

**A Museum exploring historical socio-spatial injustice in Dallas, TX**

**Mentor(s):** Kapila D. Silva, Architecture

Michael Phillips wrote in his 2001 book “White Metropolis” that Dallas has a “conflict-marred past filled with class and racial strife” and that the physical and cultural landscape of the city today represented a willful amnesia of these tensions. My creative project proposes a Museum devoted to the exploration of social injustice in Dallas from its founding in 1841 until the present day. The form of the museum is informed by its mission to recount the scarred history of the city and to present the path to reconciliation and knowledge. The museum is organized chronologically; in order to recount the largely neglected history of strife and injustice in Dallas, the exhibits are organized in a highly directed fashion. This presents an architectural vocabulary that reinforces the purposeful and ongoing nature of the injustices described in the museum. As part of the chronological understanding of the museum program, the path first descends as visitors are removed from the tranquility of the Dallas Arts District and presented with that history that has been ignored, forgotten, and erased from the collective knowledge of Dallas. The remainder of the museum ramps gradually upward, gradually enough that a visitor focused on the exhibits may not notice the grade change at all. This gesture represents the often painfully slow rate of progress in addressing social problems but eventually reveals a place of reflection nearly 40 feet higher than the lowest point of the museum. It is essential that the museum tackles multiple fronts of social strife, and not presenting multi-faceted systems as a single story. The pathway of galleries is divided into segments devoted to different periods of time and focused on different issues, from redlining and civic segregation to the role of the highway system in reinforcing racist divisions. Spatial divisions reinforce the separate forces at play in these injustices but still make clear that they all are representative of a pattern of social tensions in Dallas. The arrangement of the galleries cannot be arbitrary; in order to convincingly make the case that the spatial development of the city plays an important role in social injustice, the museum must make a spatial statement. The galleries meet at nodes that direct towards important locations in the cultural history of the city, the original plat in what is now the financial district, the Woodall Rogers Freeway that displaced a prosperous black neighborhood, the high school that is the now only physical remnant of that community, the prosperous and mostly white North Side of Dallas, and the large cultural institutions that cater mostly to these privileged classes and ignore the history and culture of marginalized communities.

**Caitlin McKaughan**  
**Dallas Museum of Agnotology**

**Mentor(s):** Kapila D. Silva, Architecture

Manipulated, chained, and choice are words that are associated with ignorance, and what it means to be ignorant. One must make the decision to either leave ignorance behind, or follow the easy road of others. Thus, a choice must be made to become informed rather than misinformed as well as to be constrained by others' thoughts or to be free to think for one's self. When designing the museum of agnotology, I began to recognize ignorance and awareness as two sides to the same whole. The design follows this duality in terms of two identical volumes sitting side-by-side; one side being more constrained and obscured while the other side is more clear and exposed. Both sides are separated with a centralized choosing point where visitors are forced to make the decision of entering either the obscured galleries or the exposed galleries. Due to my assumption that people will be more inclined to enter an exposed space, I decided the exposed, more open spaces would encompass the galleries that were designed to make individuals feel constrained, and forced, much like that of being ignorant while the more obscure half would hold the galleries that were more open, and free. I did this because it is ignorant to think that the open side will enclose the more aware type of permanent gallery. Because of the idea that ignorance is comparable to being chained, and constrained to the ideas of others, a chain-linked metal mesh wall is incorporated into the permanent galleries that follows and emphasizes the path that patrons will be taking. The density of the mesh changes due to the specific spot one is within the galleries, allowing the users to visualize the difference between an ignorance and awareness. More specifically, the mesh is assertive, and imposing, on the constrained side of the galleries whereas it is light, almost insignificant in the more exposed type galleries. This changing of densities is not instantaneous, but gradual to show the continuously slow work it takes to leave ignorance behind.

**Taylor McTague**  
**The Semantics of Ancient Greek Prostitution**

**Mentor(s):** Jane Barnette, Theatre

**Contributors:** Nathan Bowman

Porne, palake, and hetaera are three different classes of prostitutes in Ancient Greece. Historians look to a lawyer's, Apollodorus, prosecution speech convicting the prostitute Naera as the best example of how women and prostitution were all seen in the times. However, historians disagree on the actual meaning of his speech. In Apollodorus' prosecution speech against the prostitute Neaera, does Apollodorus use the terms porne, pallake, and hetaera interchangeably in this speech, ignoring the nuanced historical distinction between different classes of prostitutes or does he employ a highly detailed understanding of the distinction of the terms throughout the rhetoric of the speech, carefully using a focus of semantics to manufacture a different effect with the use of each term?



**Allie Mellor**

**Hooking-Up: A Generational Study on Commitment**

**Mentor(s):** Jenna Lyons, Women, Gender, & Sexuality Studies

This research investigates the intimate experiences of Millennial women who are part of the University of Kansas campus and have participated in heterosexual hook-up culture. Through exploring these experiences with the use of a mixed-methods survey, it is aimed to further understand how these women on our campus regard hooking up with relation to themselves. In particular, this project strives to discover how/if heterosexual hook-up culture in college impacts the attitudes these women hold regarding commitment in their own intimate relationships and the goals they hold with orientation to their futures.

**Dean Merris**

**Attitudes Regarding Facebook's 'Legal Name' Policy and Effects on At-Risk Populations**

**Mentor(s):** Bill Staples, Sociology

In this paper, I examine the potential effects of outing and corresponding opinions of Facebook's 'legal name' policy for at-risk population members. Online forums, especially social media, have become a safe haven for people whose identity puts them at some kind of risk in their everyday lives. The LGBT+ community and other at-risk populations are particularly dependent on social media for safe self-expression and socialization, often through the use of pseudonyms. Numerous anecdotal and media-reported incidents have occurred in the last several years of individuals being outed online and in social media to disastrous personal consequences, but little research has been done in this area. Some at-risk groups have attempted to reduce accidental outing and maintain online anonymity by petitioning against social media outlets' rules regarding the use of one's legal name; Facebook in particular has been a primary target of such protest. This paper discusses the benefits of anonymity and examines common reasons for use of pseudonyms online, based on theories of achieved versus ascribed identity as well as recent protests. I surveyed individuals in Facebook groups associated with at-risk communities about their at-risk status, what consequences they might face if outed, and their feelings on Facebook's 'legal name' policy. Many of the respondents anticipated negative consequences and in some cases physical danger should they be outed; these respondents felt mostly unprotected by Facebook's 'legal name' policy, and most supported changing or eliminating it.

**Chad Miller**

**Being Gay or Homosexual: The Effect of Labeling on Anti-Gay Attitudes**

**Mentor(s):** Monica Biernat, Psychology

**Contributors:** Adrian Villicana

Social group labels impact public perception of these groups. For example, gay slurs, as-opposed-to category labels (gay/homosexual), cue negative impressions of gay individuals. However, research assumes “gay” and “homosexual” to be equally neutral. In addition, research suggests that heterosexual women have more favorable perceptions of gay people than do heterosexual men. The current study examined the effects of category labeling (“gay” versus “homosexual”) on evaluations of gay women/men as a function of participant sex. We predicted that participants would report greater anti-gay prejudice toward homosexual men than toward gay men with a larger difference found among female participants. Predictions for gay women were exploratory. The above pattern may yet emerge; however, it is also plausible that labeling does not influence perception of gay women because people generally tolerate gay women. To test our predictions, we recruited 200 heterosexual participants from Amazon’s Mechanical Turk (an online research system). All participants completed two anti-gay attitude measures (explicit, “old-fashioned” prejudice and subtle, “modern” prejudice) regarding gay men, gay women, homosexual men, or homosexual women. Results suggest that labeling didn’t influence explicit prejudice, but did influence subtle prejudice. Straight men reported similar levels of prejudice toward homosexual men and gay men, but reported more prejudice toward homosexual women than gay women. Straight women reported less prejudice toward gay men than homosexual men, but reported more prejudice toward gay women than homosexual women. We suggest that the labels “homosexual” and “gay” influence straight individuals’ perception of gay women and men. Implications will be discussed.

**Zalma Molina**

**Monitoring the northern advance of injection induced seismicity in southern Kansas**

**Mentor(s):** George Tsoflias and Alex Nolte, Geology

Seismicity has become a very significant topic of concern in Kansas. It is suggested that the earthquakes are induced by the injection of fluids in the subsurface. I have been assisting in an earthquake-monitoring research program at the Wellington Oilfield south of Wichita. There are 18 seismic stations in the field where data is recorded continuously. Research begins with the cataloging of events to determine the magnitude of an earthquake, which in my study area normally ranges in magnitude between 0.4 to 2.7. Those are small earthquakes and most are not felt by people. The location of each event is graphed according to latitude vs. longitude to determine where seismicity occurs over time. A characteristic way the subsurface ruptures during an earthquake is described by the earthquake focal mechanism which categorizes each event as either a strike-slip fault, normal fault, or oblique slip mechanism. My weekly tasks consist of transferring the data collected from the seismic network into the computer server and converting into a zip and mini-seed file format for analysis and archiving. Archived data is also submitted to the Incorporated Research Institutions for Seismology and it becomes available to the scientific community. Observation of seismicity over the last two years shows that earthquakes have been advancing northward from northern Oklahoma to southern Kansas, potentially the result of high volume wastewater injections from oil field operations. The increase in pore fluid pressure in the shallow basement rocks and Arbuckle formation is believed to induce seismicity in the area. The pore pressure increase over the last five years has been shown to correlate with the occurrence of earthquakes.

**Katherin Morales & Jonathan Zhu**

**The Impact of Personality on Electrodermal Response Due to Duchenne Smiling**

**Mentor(s):** Evangelia G. Chrysikou, Psychology

**Contributors:** Ally Jones & Matthew Pfannenstiel

According to the facial feedback hypothesis, voluntary movement of the skeletal muscles involved in facial expressions can influence emotional experience and behavior. This study examined the relationship between personality type (extraversion, introversion) and EDA responses elicited by Duchenne smiling (smiling with the mouth and eyes). Twenty-four participants were instructed to smile for 15 seconds, followed by a five second relaxing period. Participants were considered introverted if they scored below 50 on the International Personality Item Pool. Introverts had higher overall EDA compared to extraverts. Changes in EDA response for all participants were statistically different than zero. The change in EDA for introverts and extraverts was not statistically significant from one another. These findings support the facial feedback hypothesis and suggest purposeful smiling can lead to a change in sympathetic nervous system activity. These findings also imply extraverts and introverts have similar EDA responses to Duchenne smiling.

**Katherin Morales**

**Attempt to Produce Lineages of *Caenorhabditis elegans* with Human Tau Protein in its Chromosome as an Experimental Model in the Study of Alzheimer's Disease**

**Mentor(s):** T. Chris Gamblin & Brian Ackley, Molecular Biosciences

Over 5 million Americans over the age of 65 have the neurological disorder Alzheimer's disease (11% of that population). Although the underlying mechanisms of this disease are unknown, two different accumulations of proteins are thought to be the main cause of neuronal cell death in Alzheimer's: neurofibrillary tangles (composed of aggregated tau protein) and A $\beta$  (a-beta) senile plaques (composed of aggregated beta amyloid). The focus of this study was tau protein only, because: (1) unlike beta amyloid, it has a known function, (2) it is found in other brain diseases in the absence of beta amyloid, and (3) its aggregation correlates with severity of human dementia, whereas beta amyloid aggregation does not.

The nematode worm *Caenorhabditis elegans* is a powerful genetic model to study the effects of human proteins involved in important biological processes, such as neurological disorders. We therefore would like to produce *C. elegans* expressing human tau protein in their neurons. However, the chance that a human tau protein will be experimentally incorporated in the chromosome of *C. elegans* is random. The purpose of this study was to see if we could successfully integrate human wild type tau protein into the chromosome of *C. elegans* experimental lineages. Of the 100 lines of worms produced, the human tau protein was successfully integrated into the chromosome of only three lines, or 3%. The expected success rate was 1-3%. These worm lineages will be used in the future to study human tau dysfunction.

**Brian Morris & Konner Cue**  
**Foraging Habits of *Colletes inequalis***

**Mentor(s):** Deborah Smith, Ecology & Evolutionary Biology

*Colletes inequalis* is the widest ranging bee of the genus *Colletes*. They have been found gathering pollen/nectar on at least 38 plant species (Batra 1980). However, since they are so wide ranging, the plant species around their habitat can vary greatly. As of now, there is not much data on what plant species in Kansas *Colletes inequalis* gathers from. The goal of this research is to gather more information on foraging sources and behavior of *Colletes inequalis*.

*Colletes* bees are known to collect pollen in order to create brood cells for their eggs. Only the females do this, the males play no role in creating the brood cells. However, our species of bee uses nectar as a food source for the eggs instead of pollen. This leads us to believe that during mating time the *Colletes inequalis* will be found more often gathering nectar than pollen. Farther into the season territorial activity begins to occur, "At Beltsville, Md., numerous male *X. virginica* hovered near some 50 nests in redwood beams about 4 m above ground beneath the eaves of a building. In 1977 most territorial activity began about March 30: however, due to cool, rainy weather, the beginning of this activity in 1978 was delayed until about April 20" (Batra 1978). This leaves us a large window of time to observe bees might be foraging and mating, depending on the weather.

Some species of *Colletes* are known to have a system of flower selection where they only visit certain plant species (Bischoff 2003). Our study might help reinforce this data or contradict it. We will monitor a few species, like redbuds, that the bees are known to gather pollen from as well as some plant species where it is unknown.

**Sean Murray**

## **The Effect of Locus of Control on Rounding Up Donations**

**Mentor(s):** Jessica Yexin Li, Marketing

**Contributors:** Mikaela Steutermann

Imagine you are making a purchase at the grocery store. As you finish checking out, the cashier tells you your total is \$24.25 and asks if you would be willing to donate \$0.75 to a local charity. Now imagine that, instead of asking you to donate \$0.75, the cashier asks whether you would be willing to “round-up” your total to \$25.00. Charity “round-up” programs have become increasingly popular over the years and have proven more effective than those employing typical donation requests. Most contributions are small, but round-up programs cumulatively raise hundreds of millions of dollars each year (Good Scout Group 2015). However, little research has investigated the underlying reasons for their effectiveness. We draw on literature in psychological pricing and locus of control to examine when and why consumers are most likely to react favorably to round-up programs. Extant work suggests round prices are more cognitively accessible than exact prices, and are preferred to non-round prices in situations, such as hedonic purchases (Wadhwa and Zhang 2014). In contrast to this extant research, we posit that certain individual differences predict how likely consumers are to participate in round-up programs. Specifically, we hypothesize that consumers with a high internal locus of control, i.e. those who believe they actively influence events and their outcomes, will be more likely to round-up due to tendency to prefer round numbers. Thus, this research contributes to the literature on how individual differences in consumer behavior influence donation likelihood in the context of psychological pricing.



**Emma Murrugarra**

**Looking at Differences in Female Mental Health: The Role of Menstrual Hormone Regulation**

**Mentor(s):** Ruth Ann Atchley, Psychology

Women tend to experience mood disorders at disproportionately higher rates than men, yet little research has focused on female-specific health contributions to this phenomenon. Hormone regulation, specifically the menstrual cycle, was targeted for investigation due to its important role in mood, sleep, and behavior. Specifically, it was predicted that women with irregular menstrual cycles, a form of hormone dysregulation, were more likely to experience increased symptoms of menstrual distress, sleep disturbance, mood disturbance, and rate of cognitive error. To investigate these differences among women, female subjects were recruited from Amazon Mechanical Turk (MTurk) to participate in a longitudinal study for the duration of one full menstrual cycle. Results of this study support the hypothesis that irregular women are more likely to experience increased menstrual distress. No other significant results were found; however, trends in the data suggest that irregular women may also experience increased symptoms across sleep disturbance, mood disturbance, and cognitive error. Limitations of sample size and statistical techniques are discussed, along with implications for future research and the utilization of MTurk in longitudinal designs.

**Benjamin Naudet**  
**Dallas Deaf Art Museum**

**Mentor(s):** Kapila D. Silva, Architecture

Someone who is deaf is often categorized as being disabled, while in reality this person considers him or herself as a part of the Deaf Culture. In other words, someone who is deaf has specific qualities and lifestyles that can be considered as an actual subculture in the broader scheme of things. Being deaf has a direct influence on how someone experiences the world around them, specifically space. The experience of how a deaf person interprets a space versus someone who has all of their senses is a concept that drives this project of designing a museum that celebrates the life and culture of deaf persons. A range of empirically-derived design principles used for designing spaces for deaf people guides the design of the museum. By utilizing both visual and acoustic factors throughout, the museum creates an experience that is translated from the deaf person to the average person. This concept is uniquely paired with the necessary exhibits and building program for this particular museum. The museum is located in the Arts District in the heart of downtown Dallas, TX. The journey through the museum starts at the entry that is located at the noisiest area of the Arts District and winds and climbs through the museum on a continuous ramp that culminates with an anechoic chamber that is located at end of the site near the quietest area of the District. Sound absorbing material are used in such a way to gradually reduce sound as one moves along the ramp that ends with deafening silence in the anechoic chamber, which gives us the world of a deaf person.

**Mitchell Newton**

**Foucault's Final Formulation: The World's Most Cited Scholar and the Problem of Historical Ontology**

**Mentor(s):** Benjamin Sax, History

**Contributors:** Katherine Clark, History

As the most cited scholar of all time, Michel Foucault (1926-1984) clearly has an enormous influence on the disciplines in the academy. It is surprising, then, to find out that there are many questions still being asked about what Foucault thought. One key example is Foucault's late turn towards describing his project as 'historical ontology.' From late interviews in 1982 and 1983, we see that he tried to give a summary of all his thinking in that one phrase. Yet many commentators have so far been unable to come to a consensus on how to interpret the phrase. Thus far the interpretation of this turn has been done with respect to philosophical analysis alone while this paper intends to carry out a historical interpretation. Such an approach would be the first of its kind.

**Halle Nick**

**The Speech-to-Song Illusion in (simulated) Cochlear Implant Users**

**Mentor(s):** Michael Vitevitch, Psychology

Cochlear implants are devices used to aid individuals who experience conductive hearing loss. Cochlear implants bypass the outer and middle ear to restore some ability to perceive speech. However, characteristics of speech differ from those of music, so cochlear implant users often have an altered perception of music. In the proposed study we want to investigate how speech filtered to sound similar to what cochlear implant users hear may affect an auditory illusion known as the Speech-to-Song illusion. In the Speech-to-Song illusion a spoken phrase is repeated several times and is eventually perceived as if it is being sung. This illusion has been found in a variety of languages and other listening conditions. Although there is some research on the Speech-to-Song illusion, there is little research on its appearance in cochlear implant users. The purpose of this study is to test varying numbers of cochlear implant channels to determine how many firing channels are necessary for the Speech-to-Song illusion to occur.

**Thomas Niemann**

**Museum of American Christianity: connecting Christian cultures and telling their impacting stories throughout U.S. history.**

**Mentor(s):** Kapila D. Silva, Architecture

As a result of both the Protestant Reformation and European Colonization of the Americas, Christianity has been one of the world's most prominent religions throughout human history. America was built on a foundation of Christian beliefs and, since that time, has continued to grow and impact this country in various ways. The Museum of American Christianity effectively and efficiently portrays the modernization of Christianity within mainstream America, while telling the story of its growth and impact throughout history. The museum is located in the Arts District of Dallas, TX, a city that has one of the largest Christian populations among major U.S. cities with approximately 30 plus different Christian churches spread throughout the metro area. A primary goal for this museum is to connect these many Christian subcultures within one museum that celebrates the core beliefs and practices within American Christianity and how they have impacted American history. The design of this museum was driven by adjectives that I call the Underlying Dimensions of the Christian Cultural Experience: proud, distinct, impacting, community, and belonging. These dimensions are incorporated into the 'proud/distinct' form, 'impacting/exploding' structure, and the 'sense of community/belonging' of the plan and programmatic flow of the overall museum experience. The form of the museum was derived from the pattern that emerges from visual connections between the churches of different denominations in Dallas. A continuous pedestrian ramp travels through galleries placed at various heights and through the expansive form of the building to reach its natural ultimate climax of a sacred space placed atop all galleries.

**Christopher Norris, Emily Kaplan, & Katie Flynn**  
**Soil Analyses of *Colletes inaequalis* Nesting Aggregations**

**Mentor(s):** Deborah Smith, Ecology & Evolutionary Biology

Introduction

*Colletes inaequalis* is a solitary ground nesting bee species native to Kansas that can currently be found on the campus of the University of Kansas. Soil is important for the lifecycle of *C. inaequalis*. It provides the matrix for their burrows, where members of the species spend their pre-adult lives. Numerous studies have revealed the different factors that play a part in burrow location choice. Somewhat strangely, the species only excavates nests beneath the canopies of deciduous trees. This project seeks to determine if the source of this preference could be related to differing soil properties beneath deciduous and coniferous canopies. This will be accomplished by studying the soil pH, soil temperatures, and the particle sizes of the soil chosen for nest aggregations beneath deciduous trees as opposed to soil samples from beneath coniferous trees.

Methods

To carry out the experiment's goal, soil cores will be taken from within nest aggregations, 10 meters away from the boundary of the aggregations, at the boundary of the deciduous tree's canopy, beneath a non-aggregation bearing deciduous tree, and beneath a coniferous tree. These cores will be used to measure pH, with the expected result of higher acidity compared to surrounding areas. Each core will also be prepared and tested for grain size analysis. Soil plasticity will be tested at the time of core collection. A temperature probe will be used at the site of each core to measure ground temperature and determine if there are any fluctuations.

**Erick Oduniyi & Brad Gibbons**

**Modeling Ebola Transmission Dynamics With Media Effects**

**Mentor(s):** Myunghyun Oh, Mathematics

**Contributors:** Fola Agosto, Ecology & Evolutionary Biology

Historically, modeling disease transmission at both the global and local scale have been particularly difficult because of the variety of factors that are in play. To begin with, it is necessary to account for human-disease dynamics within both affected and non-affected populations for a specific disease since the biology of a disease uniquely affects the way the disease transmission model is constructed. In addition to the complexity of accurately simulating how a disease traverses within a population, local health-care infrastructure, and even media coverage provide added challenges for successful prediction. Here, we construct a transmission model for Ebola that incorporates media effects to potentially give insights on how to implement treatment programs. In the end, we explore social behaviors that could directly impact the spread of the Ebola virus within the West African region.

**Daniel Okolo**

**Electronic Medical Records Impact on Nursing**

**Mentor(s):** Brittany Melton, Pharmacy

The purpose of this research study survey is to see how effective Electronic Medical Records are in healthcare facilities as well as target recurring problems that nurses are faced with while using Electronic Medical Records. This research will also examine the effects Electronic Medical Records has on nurses using them and patients they care for and determine whether this system should be upgraded frequently.



**Thomas O'Tey**  
**LGBT Portrayals in BioWare Video Games**

**Mentor(s):** Jenna Lyons, Women, Gender, & Sexuality Studies

This paper is an examination of LGBT portrayals in video games produced by BioWare. Much academic research has examined LGBT portrayals in media such as movies and television, but little examination has been put forth towards video games. This company in particular has been a leader and, for many years, the only consistent source of developed and nuanced characters who are not heterosexual. This study will involve ethnographic research of players of BioWare games and how they are viewed and considered by those who play the games.

**Kristina Padilla**

**Gender in Print: A Content Analysis of Contemporary Motorcycle Advertisements**

**Mentor(s):** Ivery Goldstein, American Studies and Women, Gender, & Sexuality Studies

Limited research is available regarding women's representations in motorcycling advertisements. However, significant research has focused on women's portrayal in advertisements in relation to their presumed role in society and found that women are consistently portrayed as hyper-sexualized or in decorative positions. The degree to which similar portrayals of women in motorcycling advertisements may exist is presently not well understood. This lack of evidence is a notable omission given the significant increase in the number of female riders over the past decade. To that end, the present study will examine portrayals of women in contemporary motorcycle advertisements in order to assess the degree to which levels of gendered stereotypes are present and thus may reinforce the persistent belief that motorcycling is for men. Using content analysis, four advertisements will be selected that feature women as the primary rider and four additional advertisements will be selected that feature men as the primary rider. These images will then be cross analyzed utilizing Erving Goffman's (1976) gender coding system. It is expected that these advertisements will reveal gendered stereotypes and a false pretense of empowerment, similar to what has been found in previous studies examining portrayals of women in sports advertisements.

**James Paisley**

**Between the Dragon and the Eagle: U.S.-Taiwan Security and Chinese Military Development**

**Mentor(s):** Brian Lagotte, Global & International Studies

**Contributors:** Megan Greene, Vickie Doll, John Kennedy, & Jonathan Hagel

In this paper, I will explore the impact of the Third Taiwan Strait Crisis on the security relationship between the United States and Taiwan. The Third Taiwan Strait Crisis occurred from 1995 to 1996 when China launched ballistic missile off the coast of Taiwan in response to the presidential elections being held on the island. The research shall be evaluated and framed inside of realist theory. The United States has historically relied upon realist theory to frame its foreign policy, and utilizing realism to explore the impact of the crisis on the U.S.-Taiwan security relationship allows for the most pertinent exploration from a U.S. perspective. Taiwan's status as being an independent country or part of China's territory is a standing issue since the end of the Chinese Civil War in 1949, and U.S. foreign policy is what maintains the ambiguity of the situation. Research into the impact of the Third Taiwan Strait Crisis on the U.S.-Taiwan security relationship reflects the difficulties inside of the U.S.-China relationship and the longstanding tradition of defending Taiwanese democracy.

**Sanjay Parashar**

**The Sensitivity and Specificity of SIRS for Organ Dysfunction in Patients Presenting to the KU Emergency Department with Suspected Infection**

**Mentor(s):** Steven Q. Simpson, Pulmonary and Critical Care Medicine

**Contributors:** Kelly Lembke

**Background:** Sepsis is organ dysfunction caused by infection. A recent proposal suggests new diagnostic criteria for sepsis (“qSOFA”) rather than current criteria using infection+SIRS+organ dysfunction (“severe sepsis”). We evaluated the prognostic accuracy of infection+SIRS to predict onset of organ dysfunction by qSOFA or severe sepsis criteria.

**Methods:** Retrospective cohort analysis of patients  $\geq 18$  years admitted through the KU Hospital ER with suspected infection 3/2007-5/2016. Presence of SIRS was determined using vital signs within 2 hours of triage. Organ dysfunction was determined based on qSOFA score  $\geq 2$  points or severe sepsis score  $\geq 2$  points 2-3 hours after triage. ROC curves were used to assess predictive accuracy of SIRS for either.

**Results:** 15,078 infected patients were identified. 5,439(36.1%) had organ dysfunction(s) on presentation of which 4,277(78.6%) presented with SIRS. 4,916 developed organ dysfunction(s), of which 3,223(65.6%) presented with SIRS. ROC analysis of SIRS for progression to severe sepsis yielded an area under the curve (AROC) of 0.5561(95% CI:0.5445-0.56773); SIRS  $\geq 2$  points had sensitivity 64.4% and specificity 43.4%. ROC analysis for progression to qSOFA revealed AROC 0.6107(95% CI:0.5997-0.6217); SIRS  $\geq 2$  points had a sensitivity of 69.03% and specificity of 47.19%.

**Conclusions:** Most infected patients who present with or develop organ dysfunction in the first 48 hours of hospitalization present with SIRS. SIRS shows weak prognostic accuracy for development of organ dysfunction  $>3$  hours after presentation, by either severe sepsis or qSOFA criteria. These suggest that SIRS presentation may precede organ dysfunction, but may not be an accurate predictor of progression to organ dysfunction.

**Danielle Peterson**

**Uncovering Biases in Edith Grossman's Translation of "Don Quixote" by Miguel de Cervantes**

**Mentor(s):** Isidro Rivera, Spanish & Portuguese

Don Quixote by Miguel de Cervantes is one of the most prolific novels of all times. Numerous translations and editions have appeared since its first publication in 1605. Renowned translator Edith Grossman released her version of the novel in 2003 to a highly receptive audience. Tom Lathrop, former professor of Romance Languages at the University of Delaware, highly regards Grossman's translation of Cervantes' masterpiece. He states, "Our collective hats should collectively be tipped in the direction of New York's Upper West Side to congratulate Edith Grossman on her achievement. This is a trade book designed for the general reader, and in this role Grossman's text is ideal – you read it, you get the story, you get lots of footnotes – in an altogether readable format."

Despite her significant contributions, various biases occur via her annotations, which we must take into consideration when analyzing this edition. Throughout the translation, Grossman includes three types of footnotes to help modern readers understand certain aspects of the novel: definitions and additional context for particular Spanish words and phrases; information about specific literature, mythologies, and locations to which Cervantes alludes; and commentary about certain aspects of the novel. Nevertheless, for the third category, Grossman fails to provide sources supporting her claims, which erroneously influences the readers' opinions about the construction and interpretation of Cervantes' narrative.

**Elizabeth Phillips**

**The Perceptual Boundary Between Two Auditory Illusions**

**Mentor(s):** Michael Vitevitch & Nichol Castro, Psychology

The Verbal Transformation Effect (VTE) is an auditory illusion where a single word that is repeated begins to morph into a different word (MacKay et.al., 1993). The Speech to Song Illusion is another auditory illusion in which a repeated phrase of several words begins to sound like it is being sung instead of spoken (Deutsch et.al., 2011). We wanted to explore what people perceive when they hear repeated presentations of stimuli between a single word and a phrase (i.e., between VTE's and the Speech to Song Illusion). Eleven college students listened to recordings varying in length from one to four words, and reported when their perception of the stimuli changed. Our results suggest that the Verbal Transformation Effect tends to be confined to one and two word lists. Song-like perceptions of rhythm changes occurred for one and two word lists, but changes in pitch occurred throughout list lengths. These results support earlier studies that suggest the Node Structure Theory (MacKay et.al. 1993) might account for these illusions. Most interestingly, we observed a previously undocumented auditory illusion in lists of one, two, and four words: patternization. This is where a word/phrase alternates between two different percepts (instead of continuing to switch to a new percept as previously observed). We hope that the insight gained by studying auditory illusions might help us better understand how typical auditory perception works and what goes wrong in certain language disorders.

**Marian Phillips**

**From Therese to Nympho: The Power of Pornography in the 18th Century and the 21st Century**

**Mentor(s):** Ivery Goldstein, Women, Gender, & Sexuality Studies

This historical research deconstructs the meaning of pornography and pornographic texts of the twenty-first century and eighteenth century in relation to representations of women's bodies, and sexuality in the era that the pornographic text was produced. By using Laura Mulvey's theory on male gaze in film and Andrea Dworkin's theory on pornography, I will analyze the text *Therese the Philosopher* (1748) written by Marquis D'Argens and the film *Nymphomaniac* (2013) written and directed by Lars Von Trier. I will argue that expressions of female sexuality pornography can be empowering as well as images and representations that may be disempowering. The theories used within the research presented will aid in the unpacking of the texts and the representations of the women in them. By using these theories I will argue that there are depictions of women that are disempowering and empowering in pornography, while also recognizing the male gaze and how it exists within pornography to construct identities and actions. The historical research used is that of data provided by close examinations of the texts and those who have contributed to the discussion on them. This historical research project will not only discuss the importance of pornography, but also express how it may be used to promote ideologies of sexuality and gender, and further discussions on how it can be used through having women as the primary character of focus.

**Eli Renfro**

**Bovine Tuberculosis in African cattle and buffalo with resource competition**

**Mentor(s):** Folashade Agosto, Ecology & Evolutionary Biology

Bovine TB is a contagious, slow-growing aerobic bacterium disease caused by *Mycobacterium bovis*. The infection commonly involves the lungs, but it may spread to other organs. It is most commonly found in cattle and other animals such as buffalo, bison, elk, and deer. More often there is close interaction between cattle and buffalo particularly during the dry seasons when resources are limited. In this study we develop a mathematical model for bovine tuberculosis transmission among cattle and buffalo and examine the impact of resource competition among the two bovine population on the disease transmission.



**Tanner Riscoe**

**Spanish influence in the history of the book from the incunables of Juan Paríx to the creation of a dynasty by the merchant Juan Cromberger and the first transatlantic appearance of the printing press.**

**Mentor(s):** Isidro Rivera, Spanish & Portuguese

**Contributors:** Erik Alder

The invention of the printing press in the fifteenth century was perhaps one of the most impactful achievements of humankind. This investigation maps the complicated history of early printed books as the techniques of Gutenberg's workshop were adopted in Europe, specifically the introduction of the printing press in Spain by Juan Paríx and the subsequent printing industry that arose in Spain. The politics and social impact of the printing dynasty of the Sevillian merchant Juan Cromberger and the development of the first printing press established in the New World are discussed. Bibliographical evidence, commercial contracts, and early works are analyzed to demonstrate the journey and impact of the printing press from Mainz, Germany with Johannes Gutenberg to Segovia, Spain with Juan Paríx to Seville, Spain and the New World with Juan Cromberger. This investigation applies the multidisciplinary study of book history to consider the journey of books through history.

**Carla Rivas-D'Amico**

**Taking Matters Into Our Own Hands: A Case Study of Abortion Activism in Lawrence, Kansas Before Roe**

**Mentor(s):** Beth Bailey, History

We often tend to think of activism around controversial issues such as the right to an abortion during the contentious era that was the 60s and 70s as playing out predominantly in large, urban cities by the usual suspects: radical leftist activists both taking advantage of and creating social upheaval to make a change. While sensational, this bi-coastal, radically focused narrative highlights great acts of resistance, but obscures a clear picture of how the fight for abortion developed for those in the oft ignored Mid-west and rural areas. By spotlighting an abortion network facilitated institutionally through the office of the Dean of Women and the Kansas Clergy Consultation Service, this case study of Lawrence and the University of Kansas illuminates the solutions both institutions and individuals created in the fight for safe and legal abortion both before Roe and during its application across the United States. More specifically, this study centers around the discovery of an abortion referral network, spearheaded by both campus ministers and the Office of the Dean of Women at the University of Kansas. The broader implications of this study point to local abortion referral networks as commonly operating through institutions and frequently established as a way to protect women from unskilled providers and grant them access to an abortion procedure.

**Carla Rivas-D'Amico**

**More Than You Know: Familial Support and Queer Relational Satisfaction**

**Mentor(s):** Jenna Lyons, Women, Gender, & Sexuality Studies

Research in the study of family communication supports the idea that perceived familial support of romantic relationships has correlating consequences to the health, satisfaction and success of those relationships. However, little research has been done into how or whether those same mechanisms that guide familial support's impact on romantic relationships translates to queer couples. The present study arose out of the author's personal experience with familial support and queer relationships, and aims to explore whether or not familial support has a correlation to same gender relationship satisfaction.

**Lauren Roberts**  
**"Englishing"**

**Mentor(s):** Isidro Rivera, Spanish & Portuguese

**Contributors:** Erik Alder

I will be talking about the prevalence of "Englishing" and its effect on the printing and translation culture in England during the Renaissance. This presentation will also focus on those translators whose role in history was so tremendous through this "englishing" technique, including, William Caxton, the first one to print a book in the English language and his influence and impact on the "englishing" revolution.

**C.W. Robertson**

**Assessing the Chemical Abundances in a Population of Star-Forming Galaxies**

**Mentor(s):** Steven Hawley, Physics & Astronomy

Everything we know about distant galaxies comes from the light they emit. Galaxies emit a spectrum of light that we can study to learn about the galaxy. Spectrophotometry is the study of that light. This technique allows us to determine physical quantities of the galaxy, such as temperature, chemical abundance, and density. All from the light or spectra it emits. There are two important chemical abundance ratios that need to be determined from the spectra to learn more about a given object. The O/H ratio is important for determining how much chemical enrichment has taken place, and the N/O ratio allows us to measure the rate of star formation in a galaxy. Both ratios are temperature dependent and rely on different lines being present in a galaxy's spectrum. Often, it is very rare to find a spectrum that contains all the emission lines necessary to determine both O/H and N/O ratios. There are several published methods in the literature that attempt to solve this problem and allow the necessary temperatures to be estimated. These methods introduce uncertainty in the result and leads to the question; how similar does a galaxy need to be to the original galaxy the technique was calibrated on? This research looked at spectra where the necessary temperatures could be calculated and both ratios could be determined without estimation. The initial findings of this research are that there is not a large discrepancy between the estimated abundance and the abundance determined directly.

**Caroline Roe**

**Cine Extraño: Feminism in the Films of Alejandro Jodorowsky**

**Mentor(s):** Jenna Lyons, American Studies

This paper will explore the films of Alejandro Jodorowsky and how his work incorporates feminist ideologies. Jodorowsky is often regarded as one of the most influential and innovative, yet underrated, filmmakers of the 20th century, and this paper intends to analyze whether he was truly progressive in both his filmmaking methods and representations of women, or merely innovative in an aesthetic sense. The lack of research on Jodorowsky and his films allows for this paper to attempt to fill in any gaps in study, but with an emphasis on feminism and female representation.

**Katherine Rorick & Amy Baker**

**Impact of Speech Rate and Masked Speech on Listener's Perception and Report of Function Words**

**Mentor(s):** Navin Viswanathan & Annie Olmstead, Speech-Language-Hearing: Sciences & Disorders

**Contributors:** Brittany Williams

Our purpose was to investigate whether the perception of function words is altered by background speech and varying speech rates. This experiment specifically investigated normal and extended rates of speech and how they interact with background speech. The second experiment in our study is focused on whether speech rate or intelligibility of speech is the most predominant factor in perception and report of function words.

**McKenzie Samp**

**Museum of Cultural Ignorance in Dallas Arts District**

**Mentor(s):** Kapila D. Silva, Architecture

The study of cultural ignorance is a complex and often a touchy subject. The process of “curing” ignorance would be difficult and there wouldn’t necessarily be one true way of doing so. To represent this struggle in the design of a museum on cultural ignorance, I looked into the architectural archetypes of the unknown and being lost - mazes and labyrinths. While similar in many ways, the differences between the two archetypes were also important. A labyrinth has only one path with one entrance and exit, and usually has some sort of spiritual significance. Mazes on the other hand can have many branches and choices with dead ends. They usually exemplify spatial awareness and intelligence. The design combines some of each of these characteristics, and therefore I have taken to defining the pattern in my design as a “labr-aze”. The site, located in Dallas, TX, itself is surrounded on the three sides by tall buildings that create a background for a space that seems to be missing an object. My proposal is to create a structure that connects to the park in front of the site while also filling the void left by the surrounding buildings. The museum is conceived as two labrazes. The first is submerged in the site and houses the main exhibit spaces. It has a very monumental feel to it, created by the materiality and height of the concrete panel-clad walls, which extend to be at a double ceiling height. There is also a sense of exposure created by a glass ceiling that acts as the floor to the second labraze. This second labraze is of the same pattern of the lower one but it appears to float above the entire structure and creates a sense of duality to the exhibits below. This labraze provides an outdoor experience with access points leading to the park. The private spaces of the museum are placed on the lower level and the public spaces on the ground level with a central access hallway that connects all the spaces and surrounds the interior labraze.



**Libby Sanders**

**Sexualization of the Selfie: The Culture of Teenage Girls on Instagram**

**Mentor(s):** Ivery Goldstein, Women, Gender & Sexuality Studies

This paper hopes to examine the culture of Instagram, particularly when regarding American teenage girls with the celebrity example of Kylie Jenner. More, it hopes to look at and caution against possible long-term effects on these teenage users. In particular, it will look at the culture of “selfies” and how the teenage girl is pushed to market her body and image. The paper will look to sources on advertising, as well as self-marketing to further this point. By looking also to how this self-advertisement is done largely in a hyper sexualized way, the paper also hope to show how teenage girls are being encouraged to focus on appearing sexual and mature. Kylie Jenner will serve as a celebrity example. At nineteen, Jenner is the tenth most followed Instagram user. Jenner’s Instagram consists mainly of pictures of herself – generally selfies. In this way, Jenner works as an example in two ways. First, Jenner exemplifies the culture in itself. Yet second, and perhaps more importantly, Jenner’s body modifications – such as plastic surgery on her lips and (reportedly) photo-manipulation of her selfies – serve to showcase the effects of this Instagram on the teenage girl’s psyche. Sources on teenage girls being effected by social media will help to further prove this point. This paper hopes to show how teenage girls, despite being photographed and posted by the teenage girls themselves, are still hyper sexualized and commoditized for public consumption, in a way that will have lasting effects on the teenage girls themselves.

**Edo Saragih**

**The Impact(s) of Labour Increment through Immigration towards Germany's Economic Growth since Reunification of 1990**

**Mentor(s):** Brian Lagotte, Global & International Studies

**Contributors:** Steven Epstein

Immigrants change the structure of the country, either economically or socially through bringing extra labour for the economy and different culture. Germany received millions of immigrants every year, resulting in the labour increment which influences both the GDP growth of the country and the welfare of the society. Economic researches in the past have shown the changes in the wage rate of menial labour workers, while anthropological researches shown the shift of culture in the country receiving millions of immigrants such as Germany. Neoclassical economic growth theory introduces the idea of labour increment translates to an increase of the GDP growth rate in the long term. I collected the statistical data of economic variables influencing a country's GDP and GDP growth. Through Ordinary Least Square (OLS) regression, I found the influence of immigration and other variables of immigrant labour to the changes in GDP growth rate of Germany since the reunification of 1990. Germany's GDP growth had varied since, while immigration had been steadily positive. While immigration increase the labour force, the ability of the economy to employ the labour force is more important in determining the changes in GDP growth. The research shows the impacts of immigration to a developed country, which can then be used by other countries as a case study in order to create an immigration policy reform. While accepting immigrants create a loss for the welfare in the short run, this research shows that long term growth labour increment brought through immigration offset the loss.

**Sarah Schaefer**

## **The Development of HepG2 as a Fetal Liver Drug Metabolism Model**

**Mentor(s):** Michael Wang, Pharmaceutical Chemistry

The primary enzyme for metabolism of pharmaceuticals and xenobiotics in adult livers is CYP3A4. This is a well-studied enzyme, with computational and cell-culture models developed for metabolism in the human body. Fetal livers, however, rely on CYP3A7 for metabolism before birth and immediately after, since CYP3A7 expression quickly drops and CYP3A4 expression increases after birth. However, there is no accepted model to study the activity of CYP3A7, making it difficult to understand how fetal livers process xenobiotics. Thus, many pharmaceuticals cannot be taken by pregnant women, as it is unknown if they can be processed by the fetal liver to avoid toxicity.

Therefore, the purpose of this study is to develop a cell culture based fetal liver model. The human hepatocellular carcinoma cell line, HepG2, was chosen as the model system, since it expresses low levels of CYP3A7. These cells were then treated with different concentrations of a chemical inducer, dexamethasone. The resulting CYP3A7 expression was studied by Western blotting, real-time polymerized chain reaction (RT-PCR), and liquid chromatography-mass spectrometry (LC/MS)-based targeted quantitative proteomics.

RT-PCR revealed a slight induction in CYP3A7 after treatment with 10, 100, and 1000 nM concentrations of dexamethasone. Targeted quantitative proteomics also revealed a slight induction in CYP3A7 after treatment with dexamethasone, confirming the results obtained from RT-PCR. However, CYP3A7 expression in HepG2 cells remained substantially lower than that of fetal livers. Furthermore, Western blot analysis did not detect CYP3A7 expression, likely due to insufficient sensitivity. Therefore, although HepG2 cell line expresses inducible CYP3A7, its value in serving as a model for fetal liver metabolism is questionable due to the vast difference in the expression level.

**Luke Schletzbaum**

**Abundance of the endemic Baja lizard *Urosaurus nigricaudus* in relation to tree root system complexity**

**Mentor(s):** Maria Eifler, Natural History Museum and Biodiversity Institute, Douglas Eifler

The black-tailed brush lizard, *Urosaurus nigricaudus*, is endemic to the Baja California peninsula. Belonging to the Phrynosomatinae subfamily, as a tree lizard, *U. nigricaudus* is known to be active early in the day and to inhabit mostly trees, brush, and rock crevices. A study including 30 different trees was conducted in Baja California Sur, Mexico in Cabo Pulmo National Park over a period of 2 weeks in March of 2017. It was hypothesized that trees with greater exposed root system complexity would lead to higher abundances during surveys, possibly due to enhanced protection from predation as well as a greater variety in basking locations. The purpose of the study was to survey these 30 trees for unique individuals, so as to investigate the abundance of lizards in relation to tree characteristics. For the duration of the study, lizards were captured and given a unique color code to identify each individual in the survey area. In order to assess the relationship between tree root system complexity and abundance of *U. nigricaudus*, 2 types of survey were conducted. 6 Surveys of the 30 trees for 4 minutes each as well as 4 surveys of the 30 trees for 1 minute each were conducted during the lizard's presumed peak activity period. The abundances were then compared to the unique characteristics of each tree to provide a picture of the relationship between the relative abundances of *U. nigricaudus* and the root system complexity of the study trees.

**Siddarth Sharma, Ryan Thomas**

**The Comparative Analysis of Nicaraguan Mestizo Populations**

**Mentor(s):** Jennifer Raff & Kristine G. Beaty, Anthropology

**Contributors:** Savannah Hay, Justin Tackney, & Michael Crawford

Mestizo populations in Central America have both Spanish and Native American ancestry. Previous studies have shown that people of Mestizo descent make up roughly 69% of the central American population with the remaining population made up of European and Amerindian lineages. However, the ancestry of Nicaraguan peoples, many of whom are thought to be Mestizo, is not yet completely understood. The purpose of this study was to characterize genetic diversity within a Nicaraguan community and compare its genetic variation with surrounding Mestizo groups. We analyzed mitochondrial lineages from 40 consenting unrelated Mestizo individuals from Nicaragua by amplifying the first hypervariable region (HVRI) of the mitochondrial D-loop from DNA extracted from buccal swabs. Our results give new insights into the population structure of Nicaraguan communities.

**John Snyder, Jonathan Plagge, Alex Newkirk, & Yuhan Ye**  
**Examining the relationship between medicinal and recreational marijuana in Colorado**

**Mentor(s):** Dan Hirmas, Geography & Atmospheric Science

The aim of our research was to assess the relationship between medicinal and recreational marijuana, particularly with an emphasis on usage patterns, in the state of Colorado. Our goal was to discover and analyze how the usage of medicinal marijuana has changed since the legalization of recreational marijuana in 2012. Our expectation was that as the usage of recreational marijuana increases, there would then be a decrease in the usage of medicinal marijuana. To allow ourselves to conduct this research we looked at information from the State of Colorado's website as well as other sources. We used these sources to understand the relationship between recreational and medicinal marijuana and we will provide the results of our findings and put forth conclusions based on those results.

**Rena Stair**

**mtDNA Variation Among *Colletes inaequalis* on KU's Campus**

**Mentor(s):** Deborah Smith, Ecology & Evolutionary Biology

*Colletes inaequalis* is a native Kansas bee that has several aggregations on KU's campus. Different from the well-known honeybee, *Colletes inaequalis* is a solitary ground nester. Not much is known about this bee, including how far it travels to start a nest site after hatching. By looking for mtDNA genetic variation among nest aggregations, we hope to find evidence indicating whether or not the females are moving widely among sites.

**Liza Stancliffe**

**Shame, Breastfeeding and Instagram**

**Mentor(s):** Ivery Goldstein, American Studies

Shame is a painful emotion inflicted on mothers by those who believe they are being unsuccessful in their breastfeeding choices. Through the analysis of medicinal, sociological and psychological studies, this research explores how the use of social media applications such as Instagram reverse shame that new mothers are typically subjected to. This type of shame often becomes self-inflicting and internalized, resembling a Panopticon effect. Previous research regarding breastfeeding and shame has been focused solely on defining and identifying the feeling of shame being experienced and less about if the emotion was reversible and how, and even then the scholarship is limited. This research explores how the specific use of Instagram can counter shame's effect, and how understanding this specific type of social discomfort can help to create a positive and educational tone of breastfeeding culture. The type of bond made through breast to mouth feeding is both biological and psychological, and has been concluded in many medical journals that feeding by breast is the preeminent way for a mother to nurture their child both physically and emotionally. Though the gathering and analyzing of the data found broadens the focus and methods related to strengthening the usage of breast feeding over bottle feeding for mothers, positively impacting the relationship with themselves and their child.



**Shaina Stasi**

## **The Effect of Glottal Source Characteristics on Speech Perception**

**Mentor(s):** Jonathan Brumberg, Speech-Language-Hearing: Sciences & Disorders

To produce vocalized speech, there must be a source of airflow, acoustic energy, and a filter to modify the air. The larynx is a primary component of the voice source and creates an unfiltered tone with complex acoustic characteristics. As air flows through the glottis and moves superiorly through the vocal tract, the air is shaped by the speech articulators. It is then filtered and modified to create a unique sound that is perceived as a voice. The glottal source signal can be defined by two major components, fundamental frequency and higher-frequency harmonics. In this study, we examined the importance of the harmonic characteristics of the glottal source on speech perception of one's own productions.

11 human subjects that participated in this speech perception study were presented with stimuli of natural and manipulated speech that vary only in glottal source harmonics with identical fundamental frequency and filter characteristics. Behavioral performance of human subjects were first tested to determine the effect of model-based synthesized glottal sources on speech perception. An electroencephalography (EEG) study of self speech perception was then completed to determine the effect of a subject's own natural and synthesized glottal source on their speech perception.

There are no differences to perception of ones own self when utterances are resynthesized using a natural glottal source waveform, but there are differences when a model, with altered harmonics, are used. This indicates that humans are sensitive to the harmonic content of speech signals for the purposes of perception.

**Taryn Stevenson**

**The Influence of the Spanish Inquisition on Print Culture in 16th and 17th Century Spain**

**Mentor(s):** Isidro Rivera, Spanish & Portuguese

**Contributors:** Erik Alder

The purpose of this investigation is to examine the effects of the Spanish Inquisition on multiple aspects of print culture in 16th and 17th century Spain. The primary goal of the Spanish Inquisition was to maintain and strengthen the Catholic faith throughout the peninsula. In order to uphold the strictest form of Catholicism, the Inquisition enforced numerous censorship rules that printers, publishers, and authors had to abide by. These regulations resulted in a change to the print culture of Spain during this period. Texts that could have potentially been interpreted with heretical or Protestant undertones were forbidden. This caused an enormous problem for migrant printers who came from Protestant countries to Spain for work. Whether these printers were actively trying to spread Protestant ideas through their work or not, they were prime targets of suspect for the Inquisition. Also during this period, many previously printed texts that had been deemed to contain heresy were redacted, or passages were covered up or crossed out. Even famous texts, such as Dante's *Divine Comedy*, had large blocks of text crossed out by hand because the Inquisition decided that the text encouraged heretical thinking. The goal of these regulations was to control the type of information people received, which in turn was an attempt to control their thinking. By enforcing numerous amounts of censorship rules, the Inquisition created an enormous impact on the print culture in Spain.

**Alex Stover, Mandi Ward, & Bernadette Chin**  
**Effects Of Racial Attentional Bias On Physiological Responses**

**Mentor(s):** Evangelia G. Chrysikou, Psychology

The purpose of this experiment was to investigate the degree to which African American men are perceived as threatening. Selective attention to the perception of threat was measured by response time to facial stimuli. Ten Caucasian and ten African American males volunteered to participate in a dot-probe paradigm task that consisted of viewing faces of African American and Caucasian males. During the task, the participants' electrodermal responses (EDA) were recorded. We predicted that participants would show faster reaction times (RTs) and greater mean EDA amplitude in response to African American facial stimuli. Results showed no significant difference in RT when dot location was congruent with the target stimuli. There was also no significant difference in mean EDA amplitude when dot location was congruent with facial stimuli. These results suggest that there were no attentional biases influenced by race when participants were presented with facial stimuli.

**Arielle Swopes**

**Social conflict affects sociality in the Prairie Vole**

**Mentor(s):** Adam Smith, Pharmacology & Toxicology

Conflict is a distressing aspect of social interaction and influences behaviors in subsequent encounters. The prairie vole (*Microtus ochrogaster*) is a monogamous rodent species in which both males and females will display territorial aggression after establishing breeding pairs. This creates a natural scenario for intruders, either males or females, to be the recipients of conspecific aggression, and often lose this conflict. However, the available research does not describe the consequences for the “losing” intruder. Thus, the current study used the prairie vole in a social conflict model to test whether being the recipient of conspecific aggression leads to behavioral changes, particularly in subsequent social behavior with other conspecifics. We used a resident-intruder paradigm in which subjects were placed in the resident cage of an aggressive conspecific for 15 minutes then a corral was placed over the intruding subject for a 45 minute “threat” session with the aggressive resident. Sexually naïve male and female prairie voles were divided into one of three controls: (1) unstressed control, (2) single conflict exposure, and (3) three consecutive days of conflict exposure. After being exposed to one of the three treatments, the subjects were observed in their home cage with a familiar same-sex conspecific to assess in-group social behavior immediately (acute) and six days (prolonged) after the last conflict exposure. In addition, subjects were tested in a social preference/avoidance test (SPA) to assess their out-group social behavior. This study will further our understanding of the impact that negative social interactions have on vole social behavior.

**Daniel Theisen**

**The Restless Monkey: Using Conceptual Metaphor Theory to Facilitate Mindfulness Meditation**

**Mentor(s):** Mark Landau, Psychology

Mindfulness Meditation is a promising tool for improving psychological health, but compliance remains low because the technique's abstractness renders it difficult to understand. To address this issue, the current project builds on Conceptual Metaphor Theory, a theory which posits that people can use metaphors on a conceptual (and not just linguistic) level to understand abstractions in terms of dissimilar, more concrete concepts. Prior studies show that metaphor use shapes self-perceptions and behavior across a range of domains. The proposed experiment builds on this work to test whether metaphor use is an effective strategy for comprehending Mindfulness Meditation technique and, in this way, strengthening commitment to therapeutically useful levels of meditation practice. The study will use both metaphoric and non-metaphoric conditions to instruct participants in Mindfulness Meditation technique and then allow them ten minutes of meditation practice. Participants' self-reported levels of perceived success, comprehension of meditation instructions, and subjective well-being will be used to evaluate the effectiveness of each metaphoric condition. Additionally, participants will be provided with information about a free Mindfulness Meditation club on campus, and their future club attendance will be used as a measure of commitment to meditation practice. A pilot version of this study is currently in progress. The full study will be conducted next fall.

**Morgan Thevarajoo**

**Inter-discipline in the Study of Art History**

**Mentor(s):** Isidro Rivera, Spanish and Portuguese

**Contributors:** Erik Alder

Art history has experienced a fluctuation of scholars that have entered the field from a different area of study. Traditional art scholars view this as a problem and consider these types of researchers to be strange and harmful to its progression. This presentation will explore the development of new fields of studies and perspectives in art history as a result of inter-discipline. By comparing and contrasting different mindsets regarding the study of art history, such as traditional and hybrid, along with giving examples through the research of Mieke Bal, Joseph Howe, and other accredited authors, this presentation shall show that, rather than hindering progress, mixing different areas of studies, such as literary and philosophy, aids the study of art history by adding new perspectives and observations that would have otherwise gone unnoticed.

**Ike Uri**

**Food Insecurity at the University of Kansas**

**Mentor(s):** Tracey LaPierre, Sociology

Though the conversation surrounding food insecurity, the lack of stable access to an adequate diet, is well established for the general public, little attention has been paid to food insecurity among college students. Media sources, including NPR, CNN, and The Atlantic, have noted disturbing trends, and the LA Times reports that within the University of California system, one out of five students are food insecure and one out of ten are homeless.

This study assesses food insecurity and related factors at the University of Kansas. This research was completed with a survey that measures food security status using a standard USDA module, also collecting information on demographics, finances, and health. The study finds that 54 percent of KU students are food insecure, and 35 have 'very low food insecurity,' which means they often reduce caloric intake due to a lack of money. These data indicate that, at KU, food insecurity is related to poor academic performance, higher age, poor physical and mental health, high stress, long working hours, and poor budgeting. These results are important, given that the food insecurity rate in Douglas County is 15 percent, and the rates at other major universities, such as the University of Hawaii at Manoa and the University of Alabama (21 and 14 percent, respectively) are lower than at KU. Additionally, data indicate that food insecurity is associated with long-term health problems and negative mental health outcomes. At universities, too, food insecurity likely relates to compounding factors such as race, socioeconomic status, and gender.

**Carla Valenzuela**

**An Analysis on the Role of New Technology on Human Consciousness Based on Walter J. Ong's, Orality and Literacy The Technologizing of the World**

**Mentor(s):** Isidro Rivera, Spanish & Portuguese

**Contributors:** Erik Alder

Orality and Literacy The Technologizing of the World by Walter J. Ong is a classic work that deliberates on and discusses the differences between oral and literate languages across the globe. Throughout his book Ong explores a variety of topics, including how writing restructures consciousness. In analyzing Ong's work, it is important to note that he wrote his book in 1982, and that since then the world has changed drastically in a many ways that affect language. Although Ong offers us a compelling perspective on what it means for a language to be literate in regards to human consciousness, it is also important to note technological innovations in the last three decades provide the basis for challenging some of his assertions. My presentation will be a thorough analysis of what assertions are still valid, and which have been invalidated due to the introduction of certain technological advancements.



**Karen Vazquez**

**Measuring Energy Consumption in Buildings**

**Mentor(s):** Elaina Sutley, Civil, Environmental & Architectural Engineering

Reduction in energy consumption and embodied carbon, both globally and locally is often the goal for many forward-thinking consumers and builders. This reduction often takes place in expected areas such as within the home and daily lives of many individuals. What is sometimes overlooked is the possibility of reducing one's global footprint not only within their home, but with their home. This is accomplished by first identifying the basic components of a home, then assessing which parts contribute most to sustainable and unsustainable applications. Using the Athena Life Cycle Assessment Calculator, the impact of two different buildings of both size and component can be calculated over the course of its expected lifetime and compared. In this study, we assessed the life cycle energy consumption and embodied carbon of two single-family dwellings using Athena. The results demonstrated the impact of specific structural elements found in a modern home and the vast potential for reduction in the effect if certain elements were switched or reduced, such as change in the roof type, for example. The roof, which accounted for over 50% of the overall global warming potential in both case studies, holds the greatest contribution to increasing the amount of embodied carbon of the home. The results from our analysis indicate that specific sub-systems contribute more to the overall embodied carbon of a building than the individual structural elements themselves. This has implications for homeowners and building contractors providing information that larger changes in embodied carbon can occur through modifying specific assemblies in the design of a home.

**Cecilia Villanueva**

**Serum Bactericidal Activity of Animals Immunized Against *Salmonella enterica***

**Mentor(s):** Wendy Picking, Pharmaceutical Chemistry

**Contributors:** Olivia Arizmendi, Francisco J. Martinez-Becerra & William D. Picking

Non-typhoidal *Salmonella enterica* serotypes (NTS) are the leading cause of hospitalization and death due to foodborne illnesses. The immune responses that occur during natural infection of NTS are only protective against the serovar responsible for the infection. Since there are over 2500 serovars, efforts to produce a broadly protective vaccine against salmonellosis have been limited. All *S. enterica* possess two Type Three Secretion Systems (T3SS) that are required for infection. The T3SS are highly conserved across serovars, which make them good targets for a broadly protective vaccine. Our group generated two fusion proteins (S1F and S2F) from the tip and translocator proteins of the T3SS. In this study, we tested for the bactericidal activity of the sera raised in animals immunized with a combination of S1F/S2F. Sera obtained from immunized and naive animals were heat inactivated and a serum bactericidal assay (SBA) was conducted. We used this assay to determine the antibody-mediated complement killing capacity generated against these proteins. Our hypothesis is that serum antibodies that recognize and bind to these specific T3SS antigens are sufficient to activate the complement system and killing of that pathogen. We assessed whether the sera of immunized animals elicited a higher level of bacterial death for *S. Typhimurium* relative to serum from naive animals. The results from these SBAs show that there is a significant difference in the bactericidal activity of immunized vs. unimmunized sera. Further research will focus on determining whether these differences can be seen by using different *S. enterica* serovars.

**Rebekah Wagner**

**Transmission Dynamics for Methicillin-resistant *Staphalococous aureus* with Injection Drug Users**

**Mentor(s):** Fola Augusto, Ecology & Evolutionary Biology

A deterministic model for methicillin-resistant *staphylococcus aureus* (MRSA) with injection drug users is developed and presented. The model incorporates transmission of the bacterial among non-injection drug users and injection drug users (IDUs) who are both low-and high-risk users. Disease prevalence data from 2008-2013 was obtained for the non-IDUs from the Agency for Healthcare and Research and Quality (AHRQ). Data was fitted to a reduced MRSA transmission model involving only non-IDUs and the parameter estimates obtained were projected to the parameters for the low-and high-risk IDUs subgroups using risk factors obtained by constructing an ethogram. Sensitivity analysis was implemented to determine the parameters with the greatest impact on the reproduction number using the reduced model for the non-IDUs; the transmission probability and recovery rates for the subgroup was found to have the highest impact on the reduced model reproduction number.

Using the full MRSA transmission model, change in risky behaviors is studied via vertical downward and upward movements among non IDUs and low-and highrisk IDUs; more MRSA cases were found with increase in risky behaviors. However, when more IDUs enter rehabilitation programs (intervention, education, clean needle exchange programs), there was a reduction in the number of MRSA cases in the community. The horizontal disease translation within the subgroups was also studied by implementing three different control strategies: low-effectiveness strategy, moderate-effectiveness strategy, and high-effectiveness strategy. Both moderate- and high-effectiveness control strategies were found to be effective in curtailing MRSA burden in the community; however, the high-effectiveness is a more effective control strategy.

**Kareem Wall**

**Do Moor Harm, Then Good: Defining Black Masculinity in Shakespeare's Othello**

**Mentor(s):** Jonathan Lamb & Sarah Ngoh, English

**Contributors:** Darren Canady

The influence that Shakespeare continues to have among scholars and enthusiasts alike is due largely in part to his ability to remain socially relevant over centuries. Shakespeare's major plays address issues involving race and other various sociopolitical identities that arguably challenge the preexisting convictions prevalent understanding identity today. Shakespeare's Othello, which features a black man or "Moor" as its lead character, sparking much debate since its inception and perhaps even more scholarly analysis. The academic conversation thus far has surrounded either title-character Othello's race as black or his male gender, but never both. This idea of intersectionality, or an interconnectedness of identities, has come to surface in recent years in defining and understanding race and how we view race. My research is a close reading of the play Othello, focusing specifically on how characteristics exhibited by character Othello define the concept known as 'Black masculinity'. My research aims to prove that by examining the play Othello through the intersectionality of the title-character's race and gender will provide the most authentic depiction of Othello to the on-going conversation. I will use several publications surrounding race and/or gender in Othello conducted thus far to analyze Shakespeare's play. It is my conviction that this background research in conjunction with my academic scholarship to-date and perspective and experiences as a Black male (most relevant to character Othello's perspective) will serve in supporting my proposed theory regarding Shakespeare's Othello.

**Meixi Wang**

**It Takes a Nation—or Many Nations: A Cross-Country Analysis of the Effects of Family and Social Factors on Program for International Student Assessment (PISA) Scores**

**Mentor(s):** John Keating, Economics

A nation's family policies and social factors inevitably influence the well being of its students. However, it is more difficult to pinpoint exactly what types of policies and factors positively or negatively affect children's academic performances. Given the growing interdisciplinary research on the relationship between social and family factors on early childhood education and student performance in the global economy, it is more important now than ever to identify and to implement effective policy to ensure that a nation's children have the greatest chance for thriving at global economy. The objective of my research project is to use mean PISA (Program for International Student Assessment) reading scores from the Organization for Economic Cooperation and Development countries over a span of 6-12 years to analyze the effects of different social and family factors on PISA test performance. I specifically address the relationship between maternity leave lengths and student PISA reading performance at the country-level, and I also separate the scores between female and male students to isolate any sex-specific effects of maternity leave lengths on student reading performance. Through my analysis, I hope to provide a holistic overview of the different family and social factors that are correlated with high PISA test performance.

**Isaac Welsh**  
**Selling Love and Power**

**Mentor(s):** Andrew Denning, History

This presentation will highlight a select few of the advertising campaigns used by the De Beers diamond company to sell diamonds to Americans by equating diamonds with love, and power. These advertisements were so successful that they created social trends so ingrained in our culture that to not follow them is to set one's self up for failure. When in fact, diamonds are actually worthless, and only have value because of price fixing, supply regulation, and a complete monopoly of the diamond business.

**Daniel Whedon**

**Are We Too Drunk to Have Sex? Students' Thoughts About Guidelines for Sexual Activity When Drinking**

**Mentor(s):** Jenna Lyons & Charlene Muehlenhard, Women, Gender, & Sexuality Studies

**Contributors:** Brittany Brower & Sarah King

Background:

With increased national attention on sexual violence, it is important to discuss the grey areas of consensual sex. This is especially important for sexual situations involving intoxication as state laws are vague on how to navigate these situations.

The purpose of this study is to analyze college students' personal guidelines for situations involving sexual activity when intoxicated as well as their ideas for what university policy should be.

Method:

Presently, we have data from 194 participants, including 76 men, 107 women, and 1 individual who identified as gender fluid. Participants were asked to describe (a) their personal guidelines regarding sexual activity when they and/or their partner had been drinking and (b) their suggestions regarding university guidelines for students engaging in sexual activity when they and/or their partners had been drinking. Participants also answered questions from the Social Roles Questionnaire.

Results and Implications:

We are using thematic analysis to identify themes from qualitative responses. Interesting themes have emerged: Some participants thought that universities should not be involved; some thought that universities should prohibit sexual activity if students have consumed alcohol. Some supported a gender-neutral approach; some supported a gendered approach. Some suggested guidelines for assessing ability to consent; some suggested obtaining written consent. Some expressed uncertainty. Some supported stricter university policies than they used for themselves and their partners. These diverse opinions illustrate the difficulty universities face in creating guidelines that most students will support

**Kayla Wilson**

**Genetic control of tissue-specific growth in the larval trachea of *Drosophila***

**Mentor(s):** Robert Ward, Molecular Biosciences

**Contributors:** Erin Suderman, Latavia Hill & Kistie Brunsell

In humans and many animals, post-embryonic development is achieved through allometric growth. Allometric growth is characterized by organs and tissues that grow tissue-specifically at different rates relative to each other. While it is known that the growth of each organ or tissue is dependent on its function, the mechanisms that control this growth are poorly understood. In order to elucidate tissue-specific growth mechanisms, we are using the larval trachea in *Drosophila melanogaster* as a model tissue. The trachea is the gas exchange organ in *Drosophila* that grows tissue-specifically. Larval tracheal growth is an excellent model to study this growth because the trachea can be easily imaged and measured in live animals, and various genetic approaches can be employed to manipulate gene expression specifically in the trachea. To identify genes involved in larval trachea growth, we screened through a collection of EMS-induced larval lethal mutations, and identified 7 mutants that have an abnormal ratio of trachea to body length. Three of the mutants show reduced tracheal growth, whereas the remaining 4 mutant lines show increased tracheal growth. Using deficiency mapping and RNAi test with the overgrown tracheal mutant, l(3)LL12265, and the reduced tracheal growth mutant, l(3)LL15149, we have begun to narrow down the specific gene that are causing the abnormal trachea phenotypes in our mutants.



**Zachary Wood**

**A remarkably sensitive  $^{13}\text{C}$  NMR approach to quantifying electronic characteristics of isocyanide ligands**

**Mentor(s):** Mikhail V. Barybin, Chemistry

**Contributors:** Jason C. Applegate, Nathan R. Erickson & Mason D. Hart

Azulene is a nonbenzenoid aromatic hydrocarbon featuring fused 5- and 7-membered carbon rings. Analysis of the  $^{13}\text{C}$  NMR signatures exhibited by the octahedral  $[(-\text{NC})\text{Cr}(\text{CO})_5]$  core in a series of related complexes  $[(\text{OC})_5\text{Cr}(2\text{-isocyano-6-X-1,3-diethoxycarbonylazulene})]$  ( $X = -\text{N}\equiv\text{C}$ , Br, H, SH,  $\text{SCH}_2\text{CH}_2\text{CO}_2\text{CH}_2\text{CH}_3$ ,  $\text{SAuPPh}_3$ , etc.) unveiled remarkably consistent inverse-linear correlations  $\delta(^{13}\text{CO}_{\text{trans}})$  vs.  $\delta(^{13}\text{CN})$  and  $\delta(^{13}\text{CO}_{\text{cis}})$  vs.  $\delta(^{13}\text{CN})$ . This concept allowed remote tuning of the electron richness of the Cr(0) center through mediation by the 2- and 6-azulenic framework. Utilizing this  $\delta(^{13}\text{CO})/\delta(^{13}\text{CN})$  NMR analysis serves as a convenient tool for discerning even subtle electronic differences in the  $\sigma$ -donor/ $\pi$ -acceptor ratios of organic isocyanide ligands CNR. The  $[(-\text{NC})\text{Cr}(\text{CO})_5]$  moiety serves as a remote spectroscopic reporter that offers a simple and quantitatively more accurate alternative to the method involving correlation of the carbonyl  $^{13}\text{C}$  chemical shifts with the corresponding CO force constants ( $k_{\text{CO}}$ ) for complexes  $(\text{RNC})\text{Cr}(\text{CO})_5$ .

**Kimberly Young**

**Woodcut Illustrations Representing Love in Early Printed Texts**

**Mentor(s):** Isidro Rivera, Spanish & Portuguese

A large part of print culture in early printed texts includes woodcut illustrations. These illustrations aided in the overall understanding and enjoyment of books after the invention of the printing press. Dependence on illustrations were significant in early printed books as this was a time of more prevalent illiteracy. Depending on the book, woodcut illustrations would depict all kinds of scenarios that span over a variety of topics. This research project will analyze the depictions of love in early printed books and how these images served in influencing large populations of people. These illustrations represent love in a variety of situations including isolation, heartbreak, courtly romance, and many others. These depictions along with their accompanying text will prove to influence and shape perspectives on love in the past, present, and future.

**Liran Ziegelman**

**Identifying Initiation of Firing in Multiple Neuronal Populations**

**Mentor(s):** Rob Kass, Psychology

**Contributors:** Michael Vitevitch & Rob Turner, Psychology

In order to understand the function and necessity of brain structures, it is crucial to be able to accurately collect, analyze, and interpret neural data. One of the most important questions in neuroscience, therefore, is how to determine the initiation of event-related firing in a single cell recording.

Current techniques used to determine the point of change from spontaneous to event-related firing (traditional onset latency analysis) creates a distribution of firing rates based on a baseline period of neural activity. This is then compared to every data point after the baseline period using a one-sample t-test until a firing rate is found that is considered statistically divergent from the initial baseline period.

This methodology raises questions due to its reliance on population variances. Doing so would likely skew the predicted onset latency in cells with a high variance at baseline and ultimately bias results in comparisons of populations with different levels of variance at baseline. This project aims to determine the accuracy of traditional onset latency analysis, propose alternative modeling solutions to determining initiation of firing in multiple neuronal populations, and to analyze the effect of using a new, modeling methodology on motor control theories.

**Liran Ziegelman**

**The impact of classroom based physical activity on time-on-task and academic achievement in elementary school children**

**Mentor(s):** Joe Donnelly, Internal Medicine - KUMC

**Contributors:** Amanda N. Szabo-Reed, Erik A. Willis, Jaehoon Lee, Charles H. Hillman, & Richard A. Washburn

**Purpose:** This study aims to explore the influence of classroom based physical activity on classroom behavior and its relationship with academic achievement. **Methods:** Seventeen elementary schools were cluster randomized to A+PAAC (i.e., physical activity, N=9) or control (i.e., no physical activity, N=8) for a 3-year trial. Teachers were trained to deliver academic instruction with moderate-to-vigorous physical activity (MVPA) with a target of 100+ minutes of activities per week. Outcome measures included academic achievement (Weschler Individual Achievement Test-III, WIAT-III), administered at baseline and repeated each spring for 3 years, time and intensity of academic lessons, and time spent on task pre-and post-physical activity. Multilevel modeling was utilized to estimate overall group difference, change rate over the study period, and group difference in this change separately for each outcome, accounting for the dependency among observations and covariates including age, gender, race, free or reduced lunch, BMI and fitness.

**Results:** This study found that participation in the A+PAAC lessons was significantly associated with a greater percentage of time-on-task behavior time throughout the entire 3-year period. A greater percentage of time spent at a MVPA level was significantly associated with more time spent in on-task behavior following physical activity participation. Finally, results showed that spending a greater percentage of time doing on-task behavior after the physical activity was significantly associated with higher math scores and spelling scores. **Conclusion:** These findings provide support that physically active classroom lessons do not have a negative impact on academic achievement in elementary aged children.

**Liran Ziegelman**

**Examining Changes in Cognitive Control Within the Prevention of Weight Regain Intervention**

**Mentor(s):** Joe Donnelly, Internal Medicine - KUMC

**Contributors:** Amanda N. Szabo-Reed, Richard A. Washburn, & Cary R. Savage

**Purpose:** This study aims to explore the influence of changes in weight, metabolic factors, and intervention phase on changes in cognitive control.

**Methods:** Participants took part in a 15-month intervention with a 3 month weight loss and a 12 month weight maintenance segment. Participants were asked to attend weekly behavioral sessions, comply with a reduced calorie, portion controlled meal diet (14 entrées, 21 shakes, 35 fruits and vegetables/wk.) and complete 100 min of moderate intensity physical activity (PA)/wk. After the completion of the weight loss phase, participants created their own meals but continued to attend behavioral sessions and exercise. Body weight and cardiovascular fitness were assessed at baseline and months 3, 6, 9, 12, and 15. Cognitive testing was conducted at baseline and months 3, 9, and 15. Session attendance, adherence to the PA and diet prescriptions and number of off-diet episodes were recorded weekly.

**Results:** This study found that the improvements of both metabolic markers and BMI are associated with improvements in cognitive control. This is done by creating longitudinal structural equation models (SEMs) where latent constructs cognitive control and metabolic health using measured Flanker, Sternberg, GoNoGo, and Stroop tasks as well as systolic blood pressure, diastolic blood pressure, and waist circumference. Weight loss is standardized across different participants using BMI.

**Conclusion:** These findings provide support that weight maintenance following a period of weight loss is associated with an increase in all four factors predicting cognitive control.