









RESEARCH &
CREATIVE WORKS
SYMPOSIUM

 **RESEARCH**  **&**
 **CREATIVE** 
WORKS 
SYMPOSIUM 


2019
PROGRAM



SOUTHWESTERN
UNIVERSITY

2019

**RESEARCH AND CREATIVE WORKS
SYMPOSIUM**

Southwestern University
Georgetown, Texas

Sponsored by:

Center for Integrative and Community-Engaged Learning

Office of the Dean of the Faculty

Paideia



SOUTHWESTERN UNIVERSITY

April 9, 2019

Welcome to Southwestern University's 20th Research & Creative Works Symposium, featuring the work of students from across the university's many fields of study.

Since its inception in 2000, this event has showcased student learning and celebrated the university's commitment to student inquiry and signature work. The Symposium highlights the creativity, intelligence, hard work, and collaborations of our students. As you will see, Southwestern students, mentored by the university's outstanding faculty, are prepared to understand their world more deeply and meaningfully contribute to it.

This year's Symposium features 243 presenters, mentored by 43 faculty and staff from across the university's departments and programs. These students will offer poster, panel, and oral presentations, show art and other creative work, share the results of their capstone or summer research, and discuss experiential learning projects. I invite you to sample widely from this rich breadth of work, and I hope you will enjoy the intellectual stimulation. I know it will educate, challenge, and inspire you.

Sincerely yours,

A handwritten signature in blue ink that reads "Edward Burger".

Edward Burger
President and Professor

Table of Contents

Contents

MAP OF ACTIVITIES 1

SCHEDULE AT A GLANCE..... 2

CREATIVE WORKS AND EXHIBITIONS 4

EXPERIENTIAL LEARNING POSTERS 10

PANEL..... 12

PERFORMANCES..... 14

ORAL PRESENTATIONS 15

POSTERS 35

INDEX 53

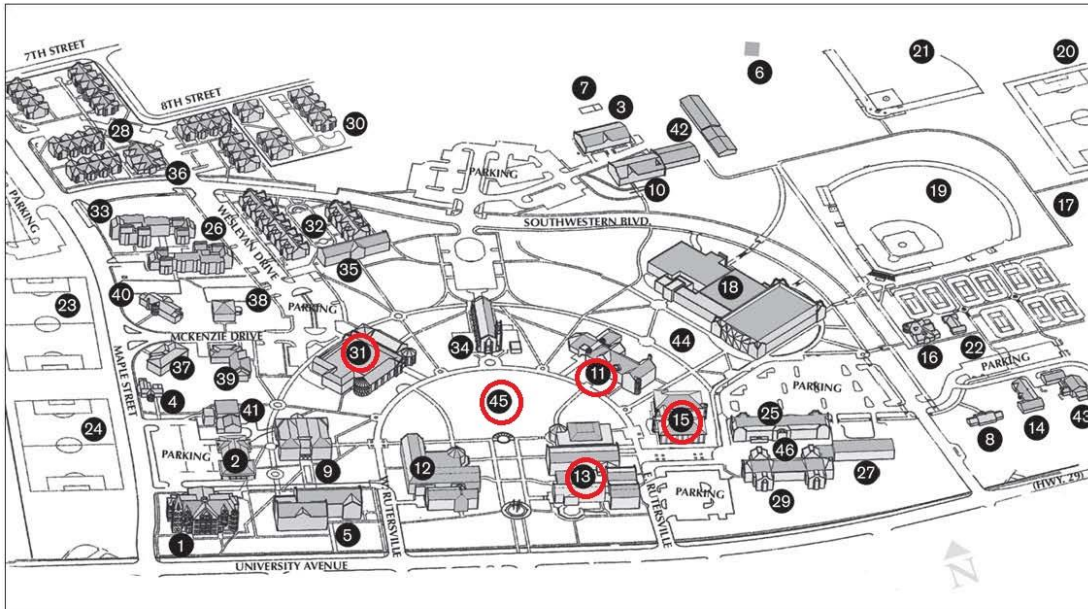
- Capstone
- King Creativity Project
- SCOPE Project

MAP OF ACTIVITIES



SOUTHWESTERN UNIVERSITY

CAMPUS MAP



ACADEMICS & ADMINISTRATION

1. Roy and Lillie Cullen Building
2. The Wilhelmina Cullen Admission Center
3. Rufus Franklin Edwards Studio Arts Building
4. Campus Police
5. Fondren-Jones Science Center
6. Fountainwood Observatory
7. Greenhouse and Community Garden
8. McCook-Crain Building
9. Mood-Bridwell Hall
10. Joe S. Mundy Hall
11. **F.W. Olin Building**
12. A. Frank Smith, Jr. Library Center
13. **Alma Thomas Fine Arts Center**
14. Kyle E. White Building
15. **The Charles and Elizabeth Prothro Center for Lifelong Learning**

ATHLETICS & RECREATION

16. Julie Puett Howry Center
17. Athletic Field House
18. Corbin J. Robertson Center
19. Rockwell Baseball Field
20. Soccer Fields
21. Taylor-Sanders Softball Field
22. Marvin D. Henderson, Sr. Tennis Courts
23. Robert K. Moses, Jr. Field
24. Snyder Athletic Field

RESIDENCE & STUDENT LIFE

25. Brown-Cody Residence Hall
26. Herman Brown Residence Hall
27. Ernest L. Kurth Residence Hall
28. Grogan & Betty Lord Residence Hall
29. J.E. & L.E. Mabee Residence Hall
30. Dorothy Manning Lord Residential Center (includes Community Room)
31. **Red & Charline McCombs Campus Center**

32. Charline Hamblin McCombs Residential Hall
33. Moody-Shearn Residence Hall
34. Lois Perkins Chapel
35. Martin Ruter Residence Hall
36. Sharon Lord Caskey Community Center (including Sorority Chapter Rooms)

FRATERNITIES

37. Kappa Alpha House
38. Kappa Sigma House
39. Phi Delta Theta House
40. Pi Kappa Alpha House

PHYSICAL PLANT

41. Central Plant
42. Physical Plant & Warehouse

OTHER

43. Turner-Fleming House
44. J. N. R. Score Quadrangle
45. **Roy H. Cullen Academic Mall**
46. Laura Kuykendall Garden

11/15/17

SCHEDULE AT A GLANCE

MONDAY, APRIL 8, 2019

4:00-6:00pm Registration Alma Thomas Fine Arts Center

TUESDAY, APRIL 9, 2019

9:00am-2:00pm Information and Volunteer Check-in Table Bishops Lounge

9:45-10:00am Introduction and Welcoming Remarks Roy H. Cullen Academic Mall

Dr. Sarah Brackmann, Senior Director of Integrative
and Community-Engaged Learning

Dr. Edward Burger, President of Southwestern University

10:00-11:00am Creative Works and Exhibitions Alma Thomas Fine Arts Center

10:00am-12:00pm Experiential Learning Symposium:
To Make Meaning and Make a Difference Charles & Elizabeth Prothro Center for
Lifelong Learning

10:30-11:30am Panel Presentation Lynda McCombs Ballroom

12:00-1:00pm Lunch Break Commons Dining Hall

1:00-4:45pm Oral Presentations FW Olin Building - Classrooms

1:30-2:00pm Performance
Short Poem Recitations FW Olin Building - Lobby

3:00-3:50pm Performance
An Ethno-drama of Pre-service Teachers Visiting
Innovative Schools FW Olin Building - Room 324

4:00-5:00pm Poster Presentations Bishops Lounge

5:00-5:30pm Celebration (*refreshments served*) Bishops Lounge

CREATIVE WORKS AND EXHIBITIONS

10:00 – 11:00 am

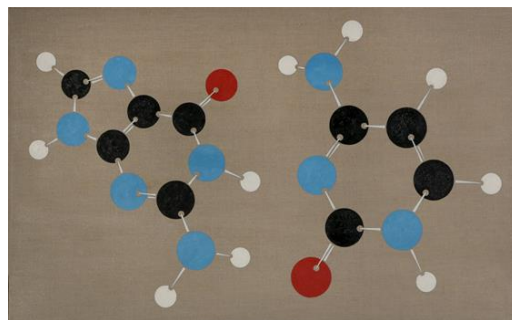
Alma Thomas Fine Arts Center – Courtyard Gallery

April 9 – April 30

Art and Art History

1. Shared Genetics, oil on linen, 24" x 36"
Lauren Muskara '20
Sponsor: Prof. Star Varner

Inspired by my work with the biology and chemistry department, I am creating a series of minimalist-inspired stylistic paintings aimed to highlight the intersectionality's between art and science. For my DNA-inspired piece (*Shared Genetics*), I manipulated the paint by grinding up three generations of my family members' hair into the paint pigment. Not only am I looking at DNA at the atomic level by presenting an image of guanine and cytosine, but I am also using shared genetic material to exemplify how the elements of DNA interact. This idea fits within my previous work, which spans the field of science and art by looking at how water molecules interact at the atomic level and manipulating chemical compounds that could never exist in nature.



2. Water Gun, oil on canvas, 48" x 48", 2018
Danbi Heo '19
Sponsor: Prof. Star Varner

The painting *Water Gun* is part of a series, *Toys! Toys! Toys!*, which as a group investigates gender identity through paintings of monumentally scaled toys in the Pop Art style using colorfully designed backgrounds that hint at each toy's functions. While celebrating the refined, precise designs of the toys and the attractive radiance of the colors that brought me to appreciate the irresistible appeal of the products' beauty, I present through this painting series a critique of Western commercial culture and the subtle ways it influences children to grow into and accept gender stereotypes.



3. Motel and Classroom from Indices in Ultramarine
Katlyn Hellmer '19
Archival inkjet prints 18.5" x 12.25" and 12.25" x 18.5" and oil on panels 34" x 23.75", 2018
Sponsor: Prof. Star Varner

Katlyn Hellmer's painting and photography series *Indices in Ultramarine* examines contemporary art's relationship with the cultural and physical environment and the ways in which an artwork's time, location, or placement within various spaces may determine how it is perceived. Additionally, this investigation intersects with ideology of Reception Theory, which refers to a version of reader response literary theory that emphasizes each particular reader's reception or interpretation in making meaning from a literary text, or in this case, the audience's reception of a visual work of art.

Each painting's final pattern and documentation of its making result from a carefully designed process that exposes the effects of an environment on an artwork and the unpredictability of an artwork's cultural reception, which I argue, depends on an audience's socio-economic class, religious or educational identity. Furthermore, the location of each painting serves to represent larger institutions and conventions that may change the way artworks are

interpreted. For example, an artwork seen in a roadside motel may be interpreted differently than the same piece seen in a gallery setting. For this exhibition three forms are presented: the painted panel, the photograph of the panel in the environment, and the marks left on the environment by the paint.



10:00 – 11:00 am

Alma Thomas Fine Arts Center - Lobby

Art and Art History

4. Enterprise
Marissa Shipp '19
Sponsor: Prof. Mary Visser

I created this transmedia video in pursuit of my artistic vision to bring my audience an immersive experience that is stimulating on a sensory level that is as emotive as it is physical. By studying my past works, numerous references, exploring new techniques and experimenting, I believe I have created my best work yet as a culmination of my experiences and efforts. Getting to this point has been an enterprise, a journey, one that has helped me become a more professional artist and fulfilled person which is reflected in my works. They allow anyone to relate because we are among the living and capable of feeling more alive. Living in a world where we are forced to grow up then die slowly from stress, work and tragedy motivates me to seize, savor and celebrate every moment of happiness, joy and excitement that counters stagnation so that I can say I lived my life to the fullest. This is metaphorically expressed in Ride of Your Life; almost all of us have been on a roller coaster ride when we were younger and screamed our heads off in fear and excitement but there is a certain nostalgia that comes with getting older and not being that free anymore, which makes us savor our memories if not desire to relive them. I wish for people to be impacted by my example of pursuing and sharing this dream. My concept of feeling more alive is just as much about the process of creating these works as it is about experiencing the finished result itself; this is what makes it art and not mere entertainment.

Theatre

5. Baroque Economic Beauty **K**
Ramish Nadeem '20 and Trevor Stoneburner '20
Sponsor: Prof. John Ore

The project is a wall of LEDs that represent a complex of global economic development data in an artistic, colorful, dynamic, and visually striking way. The project analyzes global economic development sorted by sectors of the global economy with an aim to demonstrate the interconnectedness of the economy and the dynamic communication of information globally. This project combines technical theatre, economic theory, econometric analysis, and potentially nonlinear dynamics to create a piece of art that requires skills from diverse areas of study and ideally updates in real time. The wall will be controlled by an Arduino Mega that utilizes code developed based on data that analyzed and processed through the Stata program. The code will control the array of lights and change in color and intensity to represent the changes in the underlying measure and communication of information across sectors. It will be a large, striking, dynamic, and colorful item that will be visually pleasing, intellectually informative, and ideally prompts engagement with the display and recognition of the complexity of global markets.

Mathematics and Computer Science

6. Visualizing the Fourth Dimension Through Ceramics **K**
Jacob Jimerson '20 and Aiden Steinle '19
Sponsor: Dr. Fumiko Futamura

Ceramics is one of the oldest art forms and has been a means of expression for thousands of years. In recent years, the burgeoning field of 3D printing has begun to combine computer modeling with ceramics, creating a middle ground between science and art. 3D printing allows a precision in creating artwork that no human hand can achieve. At the same time, it allows us to create mathematical objects and better understand their properties. With the precision of 3D printing, we will create objects that make the concepts of four-dimensional geometry more approachable. These forms will then be incorporated into a sculptural work that uses its basis in math to investigate the spiritual quality of higher dimensions - their inaccessibility, our belief in their existence, and human attempts to conquer them. Salvador Dali's 1954 painting Crucifixion (Corpus Hypercubus) serves as a great example of art examining higher dimensions through a spiritual lens.

7. Bias in Machine Learning **K**
William Price '19 and Elyssa Sliheet '19
Sponsor: Dr. Jacob Schrum

Machine learning algorithms use statistical techniques to give computer systems the ability to "learn" from data to make predictions or classifications. However, a model's predictions depend on the data used to train it. If data represents human bias (unconscious or not), the predictions and classifications of the model are going to reflect and reinforce these biases. It is a common misconception to believe that complex models are unbiased because they objectively evaluate raw data; they actually encode human prejudice and bias. These biases are unfortunately encoded into the models that create and reinforce social injustices such as rates of recidivism and other race generalizations. The design of a system must always take into consideration individuals who receive the implications of its output. This project aims to quantify the bias against minority groups using various types of Machine Learning models. We generate confusion matrices to analyze the precision and recall of each model with respect to different divisions of people according to sex, race, and age.

Biology

8. Bringing Global Awareness to Antibiotic Resistance Through "Lecture in a Box" **K**
Alexis Dimanche '20, Dean Dulthummon '20, Karen Rativa '20 and Sebastian Somolinos '20,
Sponsor: Dr. Stacie Brown

"Lecture in a Box" is an educational, social, and environmental initiative led by a team of four international STEM students. This project has two goals: First, it aims to spread awareness about the global, often overlooked issue of

antibiotic resistance to the general public. The second goal of this project is to increase the presence of traditionally underrepresented groups in the natural sciences. We designed a kit for teachers, containing the necessary educational materials for an engaging, introductory lecture about the issue of antibiotic resistance, as well as materials for the students to perform a fun microbiology experiment. We called this kit "Lecture in a Box", and this kit was delivered to students in four different continents, in six different countries, speaking three different languages. The lecture was successfully presented to students in Colombia, Ecuador, France, Mauritius, the United States and Spain. We collaborated with seven different institutions educating students ranging from 8-17 years old. Our project proved to be successful through the feedback received by both students and educators. Lecture in a Box managed to spark the curiosity of all participating parts, including the teachers, who felt eager to engage in Q&A dynamics with both their students and our team. This experience was for most students their first contact with research-based learning, and while evaluating the success of this project may take a longer period of time, our team was happy to witness the awareness and interest of the students growing in front of our eyes. Considering the positive feedback received so far, our team is evaluating the possibility of expanding the topics, experiments and countries included in this initiative. Several other groups, including Girl Scout troops and more schools have expressed their interest in participating in this project in the future.

Physics

9. Flex Controlled Wheel Chair **K**
Sara Boyd '20, Claire Harding '20, and Cameron Henkel '20
Sponsor: Dr. Steven Alexander

The goal of this project is to repurpose a power wheelchair and control it using a glove outfitted with sensors. The user will wear a glove that will transfer data about finger movement to an arduino via Bluetooth connection. The arduino will interpret commands from the user and indicate to the motors on the wheelchair where to move next. The arduino will be housed in a 3D-printed armband so that the user will not have wires in their way. We will modify the control functions of a power wheelchair. Rather than being controlled by the joystick, our glove will send control signals to the motors. This project has the potential to increase the accessibility of the world to people who use wheelchairs and have limited upper body mobility. There are many conditions, POTS, Postural Orthostatic Tachycardia Syndrome, Multiple System Atrophy, Ehlers-Danlos Syndrome which can make it difficult to even get up in the morning, so when a wheelchair is necessary for people with one of these conditions it can be challenging to power a wheelchair manually or using a joystick.

10. Electromagnetic Accelerator **K**
Chris Crawford '20 and Ty Stubbs '19
Sponsor: Dr. Steven Alexander

NASA spends billions of dollars researching and launching satellites into orbit using non-reusable resources like ammonium perchlorate commonly known as rocket propellant. We propose a new method of launch, using an induced magnetic field created by high-velocity currents to accelerate a projectile merely instantaneously. We are combining theoretical principles commonly practiced in Physics II and Electromagnetism known as the Lorentz force. A 1.0×10^5 microfarad capacitor bank will induce the high-velocity current producing an electromagnetic field. There will be an aluminum armature contacting the two parallel copper rods that will complete the circuit. This aluminum armature is known as a plasma armature because when the capacitor bank is discharged the current will melt the aluminum instantly allowing theoretically perfect transfer of energy. Rudimentary calculations show in a perfect transformation of energy the projectile should have a muzzle velocity of 661 meters per second. Confirmation of success will be to achieve 30% transformation or muzzle velocity of 198 meters per second, neglecting air resistance.

11. Simple Easy Spices
Brennan Eggers '20 and Alexandria Trevino '19
Sponsor: Dr. Rebecca Edwards

The inspiration of this creative activity stemmed from the kitchen. Many often struggle to make their own spices and spice mixtures for cooking, and in some cases, premade spices can be a disappointment and possibly a waste of time and/or money. By having an automated 'Spice Rack' system, the user can not only save money by buying individual

spices in bulk. The user can also take advantage of preset spice mixtures or make small batches of custom mixtures, without generating a large amount of waste. Our goal is to incorporate skills/applications learned here at Southwestern; 3D modeling/printing, art, and programming to build a 'spice rack' that generates spice mixtures for beginners or those seeking greater convenience in the kitchen.

12. GoGeo Bus Stop Upgrade **K**
Madison Godleski '19 and Claire Harding '20
Sponsor: Dr. Steven Alexander

The objective of this project is to streamline the use of the GoGeo bus system and make it more user friendly, limiting the amount of times the buses miss a pickup due to not seeing the passenger. A light will be attached to the top of the bus stop pole, which will be set off by a button, powered by solar panels. The light will be at eye level with the bus driver, which the bus rider is not while waiting for the bus. The button will trigger the light to activate an LED screen that is housed in a 3D printed case. This will then turn on with the amount of time left until the bus should arrive. Once the bus has arrived and the countdown has reached 0, the light will turn off. There is a tracking system already in place on the GoGeo buses, and this will be accessed to make this project work. This in turn means working with Georgetown Transportation supervisors to approve changes to the bus stop. Georgetown leaders and Southwestern have approved the beginning of this project and are willing to give support wherever needed. The prototype for this project will be fastened to a separate metal pole to stand in as the bus stop until the project is complete.

13. An Ancient Power Source for a Modern Problem
Thomas Harville '20, Luke Hicks '20, and Nathan Tong '21
Sponsor: Dr. Rebecca Edwards

The big fiery ball of hydrogen and helium gas that is 92.96 million miles from our home is one of the most studied things on the planet. It tells us when the day has begun and when it ends, it's an essential factor for photosynthesis, and without it, life on this planet would not exist. However, there is still so much more that we have yet to understand about the sun and the solar energy that it radiates. To this day, we underestimate the sun and its possible applications in real life situations; we plan to change that. Our goal for this project is to harness the power of the sun to propel you while on a bicycle. To fulfill our goal, any normal sized bicycle could be used as a frame to support the propulsion and energy collection system. A solar panel and battery will be attached to the top of the bike to ensure maximum charge before each use. After every use, the battery that runs the electric motor will get charged when in direct sunlight. In the end, we hope to create a near sustainable system that will allow for easy transportation around neighborhoods and city streets. Although we expect some issues to arise with the construction and testing process, we are hopeful that we will achieve our intended outcome of creating a bicycle that is powered by the sun.

14. Efficient Houses
Jonathan Howard '22
Sponsor: Dr. Rebecca Edwards

The use of solar energy and efficient living is an area that we can expand in as a country. Roofs are big surfaces that cover the majority of neighborhoods. Right now there are many companies that will sell solar panels to install on your roof. Most of the companies are selling a few, larger panels in a kit for roughly \$1,300. There are more ways that you can create efficient living in houses which I will add on to the design and model. There has not been a large market for alternative ways to install solar panels on a house. With this idea, the tiles on the roof are the solar panels. Each solar panel will be providing energy to the house. This can be used on houses all over the world to power houses individually and retail buildings. This project will include a model house made out of popsicles sticks showing the solar panel tiles. With the model, I will provide some estimated calculations of how much energy you could harvest from having the tiles installed on a house. In addition to the design, I will be proposing a way to make these panels fit the house code requirements and their connection. I will design a house and build the model using an energy efficient and eco-friendly design. The goal of this project is to educate and promote clean and efficient ways to harvest solar energy at an appropriate cost. As we continue to grow as a world, we will need more power and this is a clean and effective way to increase our power supply.

15. Ocean Energy Conversion: Electrical Energy Conversion and Desalination **K**
Kyle Howard '20, Michael May '20, Justin McCormack '20, and Hayden Smith '20
Sponsor: Dr. Steven Alexander

While conceptualizing this project, we wanted to address the critical issue of renewable energy with a solution that would effectively and efficiently generate usable energy. For this we chose the most available and untapped source: ocean water. Winds driven by weather phenomena produce waves, and rising and falling wave action produces an almost constant reciprocating kinetic force that can be tapped by shore installations throughout most of the world. Our goal is to create a self-sustaining pier, drawing energy from the ocean and converting it into electrical energy, while using Reverse Osmosis technology to create fresh water. We have emulated this by building a system that focuses around the compression and decompression of a piston with an 8 inch stroke, which then siphons the water from a water source (bucket) through hoses. After the decompression of the piston causes an inflow of water, and when the piston compresses it then pushes the water to the next section of our system. With this, the water initially enters our reverse osmosis filter generating clean energy and flows through a turbine which generates electrical energy. Then water cycles back into the original bucket resulting in a system that is completely renewable and sustainable, fulfilling our goal. Data taken will include the amount of energy produced scaled to a larger life-size mode, quality of clean water, the project's economic applicability with projected business model, and a biochemical analysis of changeable variables to greater enhance the longevity of our system in an oceanic environment.

16. Mouse Friction and the Effectiveness of Replacement Feet on Different Surfaces Measured **K**
Aris Wells '20
Sponsor: Dr. Steven Alexander

The goal of this project is to determine which factors (model of mouse, surface it is moved over and the presence of aftermarket mouse feet) or combinations of factors offer the least friction. A testing apparatus composed of a spinning test surface and a computer mouse affixed to a force gauge will be used to approximate the frictional force of each set of factors. In this case, lower friction is desirable because a mouse that requires less force to move can be used as efficiently as possible while reducing stress on the hand, improving safety and comfort. I will then generalize my data so that the average user can approximate whether they are using a high or low friction combination, and whether the differences would offer them significant benefits.

17. Automated Dental Health System **K**
Carl Willberg '22
Sponsor: Dr. Steven Alexander

The idea behind the Automated Health System was as simple as it was needed - I wanted to, in some way, increase the quality of life of as a college student. Within the confines of my own dorm room, there were concerns raised about the messiness of the dormitory, and the communal bathroom in particular. The question of hygiene seemed to come second in the pressed-for-time-situation which most students find themselves in the morning. This is where the idea of an apparatus that could sterilize the toothbrush and at the same time dispense the toothpaste, was born. That idea was then further developed into an Automated Dental-Health system with UV-light disinfection. The scope of the project and dental hygiene may seem limited or unimportant, yet research points toward correlations between poor dental-hygiene and cardiovascular diseases, in young men especially*. The project itself will be divided up into three different parts: Mechanics, Electronics and Design. All of these parts are in essence very different disciplines of physics and engineering, and that was part of the appeal of the project: Bringing together the transformation rotational movement into translateral, the programming of microcontrollers (Arduino) as well 3D-modelling and printing - all under the umbrella of one creative endeavor.

*Source (Not included in abstract): DeStefano, F., Anda, R. F., Kahn, H. S., Williamson, D. F., & Russell, C. M. (1993). Dental disease and risk of coronary heart diseases and mortality. *Bmj*,306(6879),688-691. Accessed 29/9/18

EXPERIENTIAL LEARNING POSTERS

10:00 am–12:00 pm

Charles & Elizabeth Prothro Center for Lifelong Learning

INTERNSHIPS

Sponsor: Center for Career & Professional Development

- | | | |
|--|---|--|
| 18. Katelyn Ewton '20
Colorado River Alliance
Environmental Studies | 19. Madison Flores '20
Congressman John Lewis
Political Science | 20. Morgan Forteith '19
St. Jude's Hospital-Nashville
Psychology |
| 21. B.G. Leadbetter '19
Wilco Juvenile Services
Psychology and English | 22. Austin Lovell '19
FC Dallas
Business | 23. Steven Mesquiti '19
Central Texas Treatment
Center
Psychology |
| 24. Corinne Pukys '20
NEST Empowerment Center
Anthropology | 25. Esther Ramos '19
JOLT Texas
Latin American Border Studies | 26. Laura Rativa '20
Jackson Walker – LLP
Political Science |
| 27. Brittini Rohde '19
GISD Occupational Therapy
Kinesiology | 28. Kathryn Shuttlesworth '20
The Writing Barn
English and Feminist Studies | 29. Michael Sullivan '19
University of Notre Dame
Kinesiology |
| 30. Betty Ton '19
Saturday Night Live-New York
Business | 31. Adam Wood '19
Weekly Alibi – New Mexico
Communication | |

COMMUNITY-ENGAGED LEARNING

Sponsor: Office of Community-Engaged Learning

- | | | |
|---|---|--|
| 32. Alex Hernandez '21
Faith in Action
Communications | 33. Lauren Muskara '21
Art
Amiel Padayhag '20
Anthropology & Feminist Studies
Maureen Rendon '21
Music & Political Science
Spring Breakaway | 34. Olivia Stankus '20
Boys and Girls Club
Political Science & History |
|---|---|--|

STUDY ABROAD

Sponsor: Office of Intercultural Learning

- | | | |
|---|--|--|
| 35. Elizabeth (Lizzie) Barry '21
London, United Kingdom
SU London Semester Program
History | 36. Kendall Barton '20
Sydney, Australia; Arcadia
Sydney Internship Program
Kinesiology | 37. Elizabeth (Ellie) Crowley '19
Córdoba, Argentina
ISEP Exchange: Universidad
Blas Pascal
Business |
|---|--|--|

- 38.** Myriam Ibarra '19
London, United Kingdom
SU London Semester Program
Biology
- 39.** Danyale Kellogg '19
Seoul, South Korea
ISEP Exchange: Womans
University
History
- 40.** Vasthy Maurival '19
Apia, Samoa
SIT: Social Environmental
Change in Oceania
Anthropology
- 41.** Jose Melendez '20
London, United Kingdom
SU London Semester
Program
Business
- 42.** Megan Nair '20 - Shanghai,
China
ISEP Direct
Shanghai University
Political Science
- 43.** Savannah Ritz '20
Waterford, CT
NTI: Theatremakers
Summer Intensive
Business / Theatre
- 44.** Dominique Rosario '20
Panama City, Panama
SIT: Marine Ecology & Blue
Carbon Conservation in the
Pacific & Caribbean
Environmental Studies
- 45.** Mackenzie Spence '21
Havana, Cuba
API: Language and Culture
Summer Program
Secondary Education
- 46.** Armando Vidana '19
Buenos Aires, Argentina
SU Buenos Aires Program
Political Science / Spanish

10:30–11:30 am

McCombs Campus Center, Lynda McCombs Ballroom

Modern Languages and Literatures

47. Spanish Capstones
Isabel Calleja '19, Lizzeth Cepeda Lozano '20, Gillian Glover '19, Nalyah Johnson '20, and Armando Vidana '19
Sponsor: Dr. Abigail Dings and Dr. Katy Ross

Isabel Calleja '19

El papel de intérpretes y los retos interpretativos en el sistema judicial estadounidense 


En años recientes, hemos enfrentado problemas con el uso de interpretación en el sistema judicial en los Estados Unidos donde poblaciones hispanas han aumentado. El inglés es entendido como la lengua de la ley en los Estados Unidos aunque técnicamente no hay lengua nacional, lo cual causa situaciones controvertidas e injustas en las cortes. Para combatir la barrera de idiomas, se usan intérpretes, pero la práctica de usar un intérprete tiene muchas implicaciones. El papel de un intérprete puede variar, y se ve afectado por diferentes factores. Unos aspectos que afectan la interpretación o el trabajo de un intérprete es la lengua misma y la complejidad del proceso interpretativo. La interpretación no es un proceso preciso y la omisión de cierta palabras o frases, la traducción imprecisa, y las diferencias regionales y culturales pueden impactar el mensaje expresado. La meta del estudio presente es investigar el papel de los intérpretes desde la perspectiva de los intérpretes mismos. Por medio de entrevistas con profesionales en el campo, el estudio investiga cuestiones de entrenamiento, profesionalismo, ética, y retos lingüísticos y culturales. También miro qué tipo de papel juegan en la sistema judicial, poniendo atención especial a la lingüística usada.

Lizzeth Cepeda Lozano '20

¿Quién es mi madre?: adopción de niñas chinas en España 

Esta presentación se basa en un proyecto de investigación durante el verano con la profesora Ross. Investigué el tema de adopción en España y por qué suelen adoptar a niñas de China. En esta presentación hablaré del proceso, cual es uno costoso y largo, y los problemas de aculturación de las niñas una vez llegadas a España. 1 de cada 10 niños adoptados mundialmente llegan a España, de los cuales el 77% vienen de la República popular de China. Usando información de varias fuentes de España, presentaré el proceso de adopción, explicaré por qué hay tanto interés en adopción en España, y luego presentaré varios ejemplos de familias incorporadas españolas. Con la información presentada, vemos que hay una cultura de aceptación de niños adoptados de otros países, probablemente por la baja tasa de natalidad. Con el envejecimiento de la población española y la baja tasa de natalidad, la adopción es necesaria para compensar el bajo número de niños nacidos a mujeres españolas.

Gillian Glover '19

Los medios de comunicación y la identidad de hispanohablantes 

En nuestra era globalizada tenemos acceso a medios de comunicación de todo el mundo. Esto tiene un gran impacto en las poblaciones inmigrantes porque indica que pueden mantener conexiones más fuertes con sus raíces. Los medios de comunicación, como la música, las películas, las redes sociales, los libros, las noticias, y los programas de televisión son una gran parte de la vida cotidiana de todos, y tienen un impacto importante en la vida personal y social de todos en la era digital. La meta del estudio presente es investigar cómo los hispanohablantes jóvenes consumen los medios de comunicación y en qué idiomas, y cómo el consumo de estos medios de comunicación afecta sus identidades, sus redes sociales, y su español. Pretendo investigar estas preguntas por medio de encuestas y entrevistas con jóvenes Latinx de diferentes generaciones sociolingüísticas. Este estudio enfatiza la importancia de


mantener conexiones con la cultura para resistir la pérdida de la lengua española y también para despertar conciencia sobre la necesidad de incluir y apoyar identidades más diversas en la sociedad estadounidense

Nalyah Johnson '20

Title: La lengua y la identidad inmigrante en los Estados Unidos 

El papel de los inmigrantes siempre ha sido vital en nuestra sociedad y economía. pero también implica retos para la identidad nacional. Como consecuencia, los inmigrantes deben luchar con sus identidades nativas y no nativas. El tema de la identidad es de suma importancia en relación a los jóvenes y la segunda generación de inmigrantes. El concepto de identidad no es simple como la identidad étnica o cultural sino también un sentimiento de pertenencia puesto que afecta la autoestima y cómo uno se ve a sí mismo. Por los jóvenes, sus vidas son una lucha constante entre la identidad y la cultura de sus padres, quién crecieron en otro lugar, y su identidad y cultura de la sociedad en que están. La meta del estudio presente es investigar el papel de la lengua española en la identidad inmigrante. Además, investiga varios aspectos de la aceptación en la sociedad, incluso el proceso de aculturación y también la exclusión y discriminación social. Por medio de entrevistas sociolingüísticas con jóvenes latinos en el estudio presente intenta examinar estas cuestiones de identidad estadounidense y la creación de identidades inmigrantes en nuestro país.

Armando Vidana '19

La personalidad e identidad en personas bilingües 

¿Eres la misma persona cuando hablas el inglés versus el español? ¿Piensas que tu personalidad, comportamiento y valores cambian entre los dos idiomas? ¿Y qué opinan los demás - te perciben de otra forma según la lengua que estás hablando? El estudio presente contribuye a los análisis sociolingüísticos sobre la personalidad de personas bilingües e intenta ofrecer respuestas a estas preguntas de investigación. Por medio de entrevistas sociolingüísticas, el estudio analiza las introspecciones de jóvenes bilingües en cuanto a sus personalidades y comportamientos en los distintos idiomas y también intenta analizar cómo cuestiones contextuales, políticas y sociales pueden también impactar la personalidad y el comportamiento. Además, investiga cómo los participantes perciben a otros bilingües según la lengua que estás hablando. Este estudio es relevante porque intenta mostrar que hablar un idioma específico en un contexto específico puede verse afectado por el contexto político y social en el que se encuentra una persona.

PERFORMANCES

1:30 pm

FW Olin Building Lobby

Education

48. A Poem Begins With A Lump In The Throat
Maryam Ali '20, Macie Baker '22, Elijah Ballesteros '21, Ben Brockman '21, Danielle Brown '22, Thomas Davidson '19, Byron Dowdell '20, Jesus Garcia '19, Christina Gibson '20, Sarah Graves '22, Alison Grona '22, Alexander Hoffman '20, Emma Housson '19, Gracie Huber '22, Harrison Kaeller '20, Lindsey Longuet '20, Abigail Luna '20, Wil Mekelburg '20, Daniel Merritt '20, Philip Moffatt '20, Summer Newton '22, Gregory O'Brien '19, Sydney Oropeza '19, Antonia Renfroe '22, Elizabeth Russell '22, Marisol Solis '22, and Zane Warren '21
Sponsor: Dr. Stephen Marble

In this oral poetry performance 27 students enrolled in Foundations and Curriculum in American Schools will read short poems they have created to capture their emotional connections to the place called school, typically reactions resulting from visiting sites of learning and remembering their own experiences. Starting with the above title quote from Frost about how poems arise, these authors step back in time to feel anew important events from their youth that have worked to shape their present. Sometimes funny, occasionally sad, and always surprising, each individual poem represents an emotional journey taken by the poet into his/her understanding of how institutional sites have influenced their character and development. Individual poems tell stories of bravery and fear, kindness and bullying. Taken together, the poems evoke the powerful and lasting influences that schools have had on the poets' personal, physical, emotional and cognitive selves.

3:00 pm

FW Olin Building - Room 324

Education

49. They Call Teachers by Their First Names!
An Ethno-drama of Pre-service Teachers Visiting Innovative Schools
Abigail Earle '19, Sarah Buchanan '20, and Abigail Luna '20, Co-authors: Kelli McCloughlin '18, Independent Scholar Alys Mendus, and NYC playwright Adaire Kamen
Sponsor: Dr. Michael Kamen

Southwestern University Education students and our co-authors perform an ethno-drama sharing our journey as pre-service teachers embarking on a week of school tourism with two seasoned school tourists and a young NYC playwright. We share the story of our group visiting "innovative" schools in New York City. We see each tour as a performance created by each school and perform monologues and scenes to explore the affect: as pre-service teachers stepping from familiar pedagogy into the unknown and unfamiliar. We explore our lingerings from the embodied experiences of the visits as we were confronted with dissonance regarding power relationships, conversations about discomfort with informality, lack of structure, no letter grades segued into conversations about social justice, empowerment, and activism. From this experience as pre-service teachers we move beyond school tourists to become 'residents' with these experiences and discourses of education embodied in our identity as teachers. Our thirty-minute script was originally written for and performed at the Performing the World conference in New York City in September 2018.

ORAL PRESENTATIONS

FW Olin Building – Room 207

Economics and Business

50. Private Prisons Effect on Incarceration Rates 

Byron Dowdell '21

Sponsor: Dr. Katherine Grooms

1:00 pm

Over the past decade, the United States has continuously incarcerated a significant fraction of the population. Shocking enough, despite declining crime rates, the incarceration rate in the United States has continued to increase. The purpose of this research is to better explain and analyze variables that influence the United States incarceration rate. The private prison population has grown at an alarming rate since 2012, congruent with increases in the incarceration rate. Private prisons are for-profit infrastructures that are acclaimed to be cost-efficient. I intend to bridge the explanatory gap of this mass incarceration phenomenon with regression analysis using panel data for the years 2012-2017. Using data from the Bureau of Justice Statistics for the United States, my regressions' target is to prove if the private prison population has a significant effect on incarceration rates. Also, included are societal factors that are correlated with prison populations and affect incarceration rates.

51. Financial Development and its Effect on Economic Growth 

Samuel Cox '19

Sponsor: Dr. Katherine Grooms

1:15 pm

The study of financial development and its effect on economic growth is a widely known study that, for decades, has yet to be clear. Many economists have tried to understand the difference in developed and undeveloped countries. Studies have been published that state the effect of financial development is a key indicator. Financial development is a variable that can be proxied as asset development or any other money supply (M0, M1, M2, M3). Economic growth can be measured in percentage change in GDP growth. My goal is to assess whether there is a relationship between these two variables and further my understanding of economic development. I will have to control for other variables to increase the explanatory power of my regression. These variables may include government consumption, investment, and lending growth. The method in which this study will be done is through regression analysis. The data for each of these variables will be uploaded into software called Stata and analysis will be conducted. In the software, statistical analysis on each of the dependent variables will show its effect on the outcome variable, economic growth. This will lead me to understand the true effect of financial development on economic growth. Results have not yet been completed at this point in time. My prediction for the results is that financial development will have a substantial effect on economic growth. However, it may not be as big in all countries, especially low GDP ones. I will have to dive deeper into the results to understand why. This study will provide a basis for understanding how big of an impact financial development has on economic growth. I will be looking at a number of undeveloped countries and could potentially see solutions on how to further their development.

52. The Effect of Financial Incentive Policies on Residential Solar Panel Installation 


Stan Kannegieter '19

Sponsor: Dr. Katherine Grooms

1:30 pm

Solar panel technology has gone through a rapid transition in the last decade, resulting in a significant drop in prices. However, drawbacks regarding solar energy, such as it being an unreliable source of energy or inadequate infrastructure and storage, must improve in order to fully shift to solar energy in the future. Tax credits, PACE financing, and rebates are crucial for the development and transition of solar energy. This study examines the effect of financial incentive policies on residential solar panel installations from 1998 to 2015 using a fixed effect model. The analysis will be conducted using reported solar panel installation data from the U.S. Energy Information Administration (EIA) and policy data regarding solar energy from DSIRE, which is operated by N.C. Clean Energy Technology Center at N.C. State University. DSIRE is funded by the U.S. Department of Energy. The EIA provides

installation data on solar panels from 50 states over the period 1995-2017, while DSIRE issues financial incentive policies from 50 states from 1995 to 2018. The effect of financial policies on the solar panel adoption was examined using a fixed effect regression analysis. The coefficient on the dummy variable financial incentives is positive, meaning that a financial policy contributes to a rise in solar panel installations; however, the magnitude is small. A financial policy at the state level results in a 5.34 increase in solar panel installations per 100,000 inhabitants. The effect of a 1 cent increase in the average price of electricity corresponds to approximately 1 PV installation increase per 100,000 people. Since the average price of electricity is continuous variable, it has a significantly larger impact on solar adoption compared to the financial policy. The magnitude of the two coefficients and government implications will be discussed further in the paper.


53. The Fed's Effect on Market Volatility 

Markell Henderson '19

Sponsor: Dr. Katherine Grooms

1:45 pm

In this project, I examine the effect that the United States Central Bank (the Fed) has on stock market volatility. I specifically look at Fed interest rate announcements. In my model, I account for things such as day of the week, general announcement expectations, and market momentum. I use panel data from 2012- 2017 focusing on companies in the S&P 500 and the CBOE Volatility index. I expect to find that regardless of expectations, Fed announcements increase stock market volatility. Additionally, I study total and sector performance and their increases and decreases in value after announcements.

54. Does the Stock Market Accurately Predict the President's Approval Rating? A Case Study 

John Hattan '19

Sponsor: Dr. Katherine Grooms

2:00 pm

While the literature suggests the stock market and President's approval rating correlate, whether the president has higher approval ratings from higher stock market numbers, higher approval ratings indicate better a stock market, or if another factor affects both, remains unclear. Some literature suggests volatility, or any sort of uncertainty in the president's plans or stock market's future, impacts both. This project will analyze S&P 500 data alongside Gallup Presidential approval ratings from the mid-1990s to modern day. To control for market growth, the S&P 500 will be analyzed both as a raw number and as a percent change from the last measurement. After noting key dates for or against the trend, these dates will be tested for any relation to each other, to potentially pinpoint an underlying cause. In addition, this paper will analyze ratings both by party and administration, to see if ratings impact people's perceptions of political parties or administrations differently.


55. Discrimination in Peremptory Challenges 

Diana Trevino '20


Sponsor: Dr. Katherine Grooms

2:15 pm


Two Supreme Court cases, *Batson v. Kentucky*, 476 U.S. 79 (1986) and *J.E.B. v. Alabama ex. rel. T.B.*, 511 U.S. 127 (1994) have ruled it unconstitutional for attorneys to use peremptory challenges to remove potential jurors based solely on race or gender. However, more recent literature argues that attorneys continue to use demographic characteristics to remove potential jurors they believe are likely to favor the opposition (Anwar et al. 2010; Anwar et al. 2014; Flanagan 2018; Beck 1998). This paper uses a data set of North Carolina felony trials in 2011 to construct a linear probability model and find statistical significance in the use of peremptory challenges to strike potential jurors based on race and age. The research presented in this paper finds that a black potential juror is 6.9% more likely to be challenged by the state, compared to a white potential juror. If the defendant is also black, the magnitude of this effect is greater and it is 12.39% more likely that the state will use a peremptory challenge to exclude the black potential juror. Additionally, older jurors were more likely to be kept by the state and removed by the defense.

56. Global Innovation and Intellectual Property Rights  C
Abigail Boatwright '19
Sponsor: Dr. Katherine Grooms 2:30 pm


Innovation benefits economies through improving standards of living, disseminating knowledge, spurring economic growth, and enhancing overall productivity. For these reasons, effectively incentivizing innovation is critical to promoting economic growth and overall welfare. Patent systems and international intellectual property treaties are the primary regulatory tools of governments to protect and encourage domestic and international intellectual property. This paper extends current analysis regarding potential non-linearity in the relationship between intellectual property rights (IPRs) enforcement and global innovation by introducing patent quality as an additional measurement of innovative output. The regression models assesses the differential effects of low, medium, and high IPR enforcement on the number of published patents per capita and the quality of those published patents for 50 countries. The results do not identify a threshold of IPR enforcement, and instead find a generally linear relationship between IPR enforcement and the number and quality of innovative outputs. This study is being expanded to a panel data set, containing 100 countries and spanning the years 1985-2015, in order to analyze changes in country IPR enforcement over time.

57. The Effect of Education on Voter Turnout  C
Chayce Hobelman '19
Sponsor: Dr. Katherine Grooms 2:45 pm

Voting is a fundamental mode of political participation. It is crucial for democracies to bear in mind the will of the citizens, and it is crucial for citizens of all types of societies to help by voting. With education growing as a necessity to become a part of the working class, as well as it becoming a big part of political controversies, it is necessary to know how, or if at all, this affects one's voting behavior. There are some literature pieces that provide evidence to suggest different levels of education factor into whether or not people vote. This study will look at Texas county-level data for the 2016 presidential election and assess the effect of education on voter turnout. Along with education, other economic inequalities will be assessed in order aid the study. The effect of education on voter turnout is hoped to be found statistically significant after assessing all factors.


58. Brexit and Equity Market Comovement  C
Jebb Vandervalk '19
Sponsor: Dr. Katherine Grooms 3:00 pm

The United Kingdom's (UK) June 23rd, 2016 referendum to leave the European Union (EU) surprised the globe and left politicians, investors, and businesses reeling to understand the consequences of this "Brexit." After the formation of the EU in 1993, European financial markets have increasingly integrated and comovement has become more prominent. This relationship, however, may now begin to unravel due to Brexit. With the EU being the first major multinational currency union, the novelty of this exodus offers a unique opportunity to analyze any changes in financial interdependence of an exiting state. Superficially, a devalued British pound and slowing growth of the British economy point to this disentanglement, but this can be explained by a devaluation in British assets and slowing activity; not a shock to the trend of comovement between markets. Studying the status of comovement is of crucial importance for investors around the globe who often rely upon principles of diversification in their investment strategies. To do so, I focus on equity markets and examine their movements in the UK, EU, China, and the US to determine whether the Brexit referendum and various related announcements have truly altered interdependence structures throughout global equity markets.


59. The Effect of Natural Disasters on Education  C
Dejan Savic '19
Sponsor: Dr. Katherine Grooms 3:15 pm

Education is an important variable in the future economic outcome of individuals and plays a large role in the accumulation of human capital. There is a necessity to examine events whether natural or human-caused, that can affect crucial components of an individual's life, such as future careers, income, educational attainment, etc. The purpose of this study is to estimate the effect of natural disasters on education by using public high school dropout rates in areas affected by natural disasters. To achieve this, a panel data study will be conducted that compares


district dropout rates from the years before, during, and after the occurrence of a natural disaster within an affected area. Furthermore, this study aims to determine if there is a difference in effect for the specific type of disaster, i.e. hurricanes, tornadoes, and earthquakes. Overall, I hope to determine the significance of the effects natural disasters have on education.

- 60.** Urbanization, Inequality, and Development: Lessons from the Past Half-Century of Economic Industrialization 
Ramish Nadeem '19
Sponsor: Dr. Katherine Grooms 3:30 pm


This investigation aims to isolate the causal effect of rate of urbanization for a given developing country on life quality outcomes such as health, inequality, or human development using OLS methods. Variables like strength and robustness of institutions, initial GDP per capita, and large, structurally significant transfers or investments are held constant in order to isolate the effect of urbanization. For rate of urbanization, this project utilizes the rate of change of the proportion of the population that is "urban". The World Bank has a repository of this data that comes from the United Nations Population Division's World Urbanization Prospects project's 2018 revision. Initially, the Human Development Index from the United Nations Development Programme is employed as an outcome measure. Individual metrics that compose the HDI such as health, work/employment and vulnerability, and education are also examined. Insights into the most recent wave of global urbanization and its effects on life quality in the developing world along with potential policy initiatives are discussed.

- 61.** The Effect of Property Rights on GDP Growth 
Kai Knight-Turcan '19
Sponsor: Dr. Katherine Grooms 3:45 pm

My research will aim to analyze and determine the effect of property rights on the growth rate of a country's GDP. This is a topic of interest in the field of economics because it contributes to the study of the way the protection of property incentivizes subjects to innovate and pursue more wealth. Multiple academic journals contain works that include metrics that measure the restrictiveness of property rights; the more rights one has to their property, the higher the score. Property refers to anything that is owned and of value to a person, thereby increasing one's wealth, which creates the desire to have that property protected. Potential explanatory variables include the income tax rates of certain regions, as well as the estate tax rate. Past findings have focused on cultivated land that is owned by a person, and that person's ability to pass said land down to his or her kin. I will aim to take this further and focus on all types of property; which includes income and intellectual property in addition to possessions. Differences in laws and standards across countries/states/cities will be another very important factor in this research.

- 62.** The Link Between Education Spending and Poverty 
Ethan Hallmark '19
Sponsor: Dr. Katherine Grooms 4:00 pm

This paper will explore the link between the government's funding of education and outcomes as an adult, specifically poverty level. More specifically, I will hope to identify if increased spending on public education has a positive relationship with poverty level, as well as other adult outcomes such as years of school completed, wages/income, and employment levels. I would also like to explore if different demographics, are affected in different ways, including gender, race, and possibly class. Previous literature on this subject finds that there is a positive relationship between spending on education and educational attainment, general welfare, schooling-specific outcomes like dropout rates, wages, and poverty.

- 63.** The Effect of Tea Drinking on Long Term Health 
YingRan Lin '19
Sponsor: Dr. Katherine Grooms 4:15 pm

Tea is one the most popularly consumed beverages in most countries. Numerous researches have proven that daily consumption of tea is highly correlated with reductions in development of life threatening chronic diseases. As an extension to these previous studies, this research attempts to measure and summarize the effect of tea consumption on life expectancy across countries using data in the year of 2016 with Ordinary Least Square regression method performed by STATA. The study hopes to confirm the hypothesis is that tea drinking could increase life expectancy

of a population relatively and to measure that effect. In addition to the consumption of tea, other factors that have been found to be associated with life expectancy are also included in the correlation analysis. At the current stage of research, the variables of interest related to health considered are per capita tea consumption, health care quality indicators, and mental disorder rate; variables of interest related to socioeconomic factors are unemployment rate, per capita GDP, and divorce rates by calculation. The data are retrieved from World Health Organization, World Bank, OECD, Our World in Data and others. This study focuses on measuring the current effect of worldwide tea consumption on life expectancy of the populations. Acknowledging that the finding may not explain how mineral intake from tea drinking may affect a particular individual, the research could shed light onto how this dietary habit is currently influencing individuals' health and life.

FW Olin Building – Room 209

Mathematics and Computer Science

- 64.** Sharp Bounds for the Ratio of Generalized P-Complete Elliptic Integrals
 Elyssa Sliheet '19
 Sponsor: Dr. Kendall Richards 1:15 pm

The following basic problem is familiar to many calculus students:
 Consider the pattern below and then make a conjecture

$$1 + \frac{1}{2} = \frac{3}{2}$$

$$1 + \frac{1}{2} + \frac{1}{4} = \frac{7}{4}$$

$$1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} = \frac{15}{8}$$

$$1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \frac{1}{32} + \frac{1}{64} + \frac{1}{128} + \dots = ??$$

The well-known geometric series is given by $1 + x + x^2 + x^3 + \dots$.

We discuss an extension of this series known as the hypergeometric function. This function was studied by Gauss and has many interesting connections to other *special functions* (sometimes referred to as the functions of mathematical physics). While much of the development of the study of special functions was inspired by applied mathematics, our interest here falls on the theoretical side as we investigate connections to a class of special functions known as complete elliptic integrals. In particular, we will present sharp bounds for the ratio of generalized p -complete elliptic integrals by using basic properties of inequalities and elementary calculus. These findings refine and generalize recently obtained results.

- 65.** Infinite Art Gallery: A Game World of Interactively Evolved Artwork
 Bryan Hollingsworth '20
 Sponsor: Dr. Jacob Schrum 1:30 pm

Procedural Content Generation (PCG) is an approach that has been used extensively in video games as both a cost saving measure and a means to increase replay ability. Evolutionary computation is one approach to procedural content generation that can continually create new content tailored to particular users. This presentation introduces the Infinite Art Gallery, a game that uses established methods of evolving art with Compositional Pattern Producing Networks (CPPNs) to allow users to explore a world of art tailored to their preferences. From a first-person perspective, users explore room after room of evolved paintings and sculptures. Each painting is a doorway that leads to a new room with art derived from a selected painting and sculpture in the previous room. Users also have an inventory of collected paintings that can be used to return to old favorites, and they can also influence the generation process with special item pickups. To gauge user response to the game, a human subject study was conducted with 30 users. This presentation considers the feedback from that study and examines the effectiveness of this new type of gaming experience.

66. Desirable Behaviors for Companion Bots in First-Person Shooters
Adina Friedman '19
Sponsor: Dr. Jacob Schrum 1:45 pm

Video games often provide players with assistance in the form of companion characters that fight alongside them. In this study, the Java middleware Pogamut was used to create two bots for the first person shooter Unreal Tournament 2004 (UT2004): a highly skilled bot whose behavior is defined by an evolved neural network and a hand-coded bot designed to be more companionable. These bots served as companion characters to players in a human subject study. Participants played a game with each companion bot in the team deathmatch game mode, in which points are earned by repeatedly killing members of the other team, and players are allowed to respawn infinitely after death. At the end, the team with the most kills wins. Matches lasted ten minutes, and each human/bot team competed against two of the bots native to UT2004. After the rounds were over, players completed surveys that allowed them to rate each bot's behavior and provide open ended feedback. The evolved bot was consistently rated higher in player assessments, but not by a statistically significant margin. However, further analysis revealed that there was a significant preference for whichever bot players saw more often, perceived to be a better follower, and identified as more helpful. These observations give insight into the behaviors that players preferred in the companion bots, even when exhibited by different bots.

67. Evolving an Intelligent Ms. Pac-Man Agent Under Partially Observable Conditions
William Price '19
Sponsor: Dr. Jacob Schrum 2:00 pm

Ms. Pac-Man is a well-known video game used extensively in artificial intelligence research. Past research has focused on the standard, fully observable version of Ms. Pac-Man. Recently, a partially observable variant of the game has been used in the international Ms. Pac-Man vs. Ghost Team Competition. Restricting Ms. Pac-Man's view makes the game more challenging. Ms. Pac-Man can only see down halls that are within her direct line of sight. The approach to this domain in this presentation extends an earlier approach using MM-NEAT, an algorithm for evolving modular neural networks. An artificial neural network encodes decision making behavior into a graph structure. This process emulates natural neural networks such as the human brain. MM-NEAT uses Darwinian natural selection to select for the artificial neural networks that exemplify the best behavior in Ms. Pac-Man. Experiments using several forms of evolved and human-specified modularity are presented. The best evolved agent uses a human-specified task division with output modules for different situations: no ghosts, edible ghosts, and threat ghosts. This approach placed first at the 2018 Ms. Pac-Man vs. Ghost Team Competition against seven other competitors, earning an average score of 7736.63.

68. Restrictions on Homflypt and Kauffman Polynomials Arising from Local Moves
Mercedes Gonzalez '21
Sponsor: Dr. Sandy Ganzell, St. Mary's College of Maryland 2:15 pm

A mathematical knot is an embedding of a circle in R^3 considered up to continuous deformations. A local move on a link diagram is a substitution, inside a prescribed ball, of one subdiagram for another that results in another link diagram. Local moves are considered "bidirectional" in the sense that if we permit the substitution of subdiagram X for subdiagram Y, then we also permit the substitution of Y for X. Reidemeister moves are local moves that preserve the link type, whereas a crossing change is local move that may change the link type. We say that the local move M is an unknotting move if repeated uses of M (together with Reidemeister moves) can transform every knot diagram into a diagram of the unknot. We say that M is an unlinking move if repeated uses of M (together with Reidemeister moves) can transform every n-component link diagram into a diagram of the n-component unlink. We study the effects of certain local moves on Homflypt and Kauffman polynomials. We show that all Homflypt (or Kauffman) polynomials are equal in a certain nontrivial quotient of the Laurent polynomial ring. As a consequence, we discover some new properties of these invariants.

Biology

69. A Snail Out of Water: Apple Snail Detection Along Oyster Creek (Missouri City/Sugar Land, TX) **S**
Shellsea Miller '20 and Lauren Muskara '20
Sponsor: Dr. Romi Burks 2:30 pm

Environmental DNA (eDNA) refers to residual material an organism leaves in its environment. Collecting and analyzing eDNA to detect species offers a non-invasive way to document presence and track species spread, both within and across environments. The four pillars supporting the "ecology of eDNA" examine how material origin, state, transport and fate influence detection ability. Using eDNA, we first aimed to detect apple snails (*Pomacea maculata*) at one known (White Lake) and one suspected site (Oyster Creek), both located in Cullinan Park (Sugar Land, TX). We later explored the possibility of eDNA transport along Oyster Creek by collecting samples at nine locations, starting with a known population of *P. maculata* in nearby Missouri City, TX. For all samples, we filtered 250 mL of water using 1.2 µm isopore membrane filters and used CTAB/chloroform to extract eDNA for amplification with quantitative PCR (qPCR). In our first collection, White Lake samples taken near shore exhibited the highest concentration of apple snail eDNA and confirmed visual sightings. eDNA samples from Oyster Creek, a close-by stream with no obvious surface connection to White Lake, indicated apple snails presence at lower quantities, despite the absence of visual evidence of the population. Our continued analysis of Oyster Creek samples will provide insight into the likelihood of a resident population versus greater influence from upstream locations. Overall, our work provides the first successful detection of apple snails using eDNA and helps strengthen our knowledge within the specific subfield of the ecology of eDNA.

70. Unraveling the Mystery: Genetic Identification of Non-Native Asian Mysterysnails, *Cipangopaludina chinensis* and *C. japonica* **C**
Hannah Winkler '19
Sponsor: Dr. Romi Burks 2:45 pm

Similar to other non-native mollusks, Asian mysterysnails (*Cipangopaludina* spp.) threaten ecosystems by disrupting nutrient cycling, competing with native species, and potentially acting as an intermediate host for parasites. Back in 2015, our laboratory documented the first known occurrence of *C. japonica* in Texas, at a site far from previous records of *C. chinensis*, a morphologically similar species that also shares ecological traits with *C. japonica*. Our discovery raised suspicion that Asian mysterysnails might suffer misidentification across their non-native range. Thus, our project seeks to elucidate scientifically valid identities of ~200 Asian mysterysnails through dissection, tissue extraction, target amplification, genetic sequencing, and phylogenetic analysis. In mysterysnails and other freshwater mollusks, sole reliance on morphology makes species identification difficult, prompting need for genetic analysis. Our barcoding efforts of COI failed to yield sufficient usable sequence. To attack this question from another angle, we recently began sequencing the 16S rRNA gene of snails visually-identified as *C. chinensis* to determine accurate genetic identification. At this time, we have 51 sequences of sufficient quality (ranging from 281-505 base pairs with an average length of 438 base pairs) to include in phylogenetic analyses. We continue to add to this total for ongoing phylogenetic analysis. Preliminary results confirm the majority of samples as *C. chinensis*, however, at least one site contained *C. japonica*, and two samples suggest another viviparid co-occurring. Knowing correct genetic identities of non-native species provides insight into patterns of spread and allows for greater understanding of the potential dangers they present to ecosystems.

71. Following the Curve: Environmental DNA Accumulation and Degradation Rates Utilizing Apple Snails
Madison Granier '19
Sponsor: Dr. Romi Burks 3:00 pm

Environmental DNA (eDNA) represents extra-organismal DNA that individuals release into their environment. Conservation efforts have recently documented more sensitive, cost effective results from eDNA rather than traditional survey methods. Improved understanding of the origin, state, transport, and fate of eDNA provides insight into its utility and limitations, thereby improving confidence in conservation studies. We quantified eDNA production by the freshwater apple snail (*Pomacea maculata*) and investigated how abiotic factors influenced eDNA accumulation and degradation. We placed adult snails in a two-by-two mesocosm design (N=5) with warm and cool temperature treatments crossed with freshwater and salt treatments (6 ppt). DNA accumulated over 72 hours. After this time, we removed the snails and allowed DNA degradation to occur over the next 72 hours. We took water

samples (250 mL) at 12 time points and then ran material through 1.2 µm Isopore membrane filters to retain eDNA (feces, slime, tissue, etc...), which we later extracted with chloroform to obtain total genomic DNA for use in quantitative PCR (qPCR). We detected eDNA in all treatments for at least 24 hours after snail removal. In addition, eDNA had greater accumulation and a faster degradation rate at higher temperatures. Low salt tended to increase eDNA quantity, especially at warmer temperatures, but failed to notably influence degradation. Overall, this research will continue to add valuable insight into the ecology, persistence, and the ultimate fate of eDNA. These results provide a foundation for further investigations of factors that influence eDNA accumulation and degradation.

72. Phantom of the (rumAB) operon: Transcriptional Regulation of the Mutagenic Activity of the Error-Prone DNA polymerase RumA'2B **S**
Chandler Hyatt '19, Antonio Mendez '20, Lacey Mims '20, and Athena Pinero '20
Sponsor: Dr. Martín Gonzalez 3:15 pm

Triggered by the SOS response, the activation of the error-prone DNA polymerase RumA'2B functions to replicate past DNA lesions via translesion synthesis (TLS), following severe DNA damage. Located within the highly mobile integrative conjugative element (ICE) 391, the mutagenic nature of this polymerase can accelerate the spread of pathogenic phenotypes, like antibiotic resistance, among bacteria. The mechanisms activating this low fidelity DNA polymerase in the SOS response are widely accepted; however, the factors regulating the mutagenesis of RumA'2B remain undiscovered. To investigate the regulatory mechanisms located on the element, knockouts of croS, rumAB, and lon391 were created in various lexA backgrounds of Escherichia coli. Mutagenesis assays were then performed to evaluate changes in the rate of RumA'2B-mediated mutagenesis. Genes reducing and augmenting the mutagenic activity of this error-prone DNA polymerase have been identified and characterized. Future work will assess host contributions affecting the mutagenic activity of RumA'2B by performing protein degradation assays of the heterotrimer's subunits in ATP-dependent protease knockouts.

Physics

73. Automated Precision Ascent Parasail System **C K**
Gordon Williams '19
Sponsor: Dr. Steven Alexander 3:30 pm

The key goal of this project is to enable weather balloons to autonomously and inexpensively ascend to desired horizontal coordinates using wind. By constructing a morphable parasail controlled by an Arduino that uses live wind data and GPS, the module should be able to sail the weather balloon and radiosonde to a specific horizontal location. The significance in this device is being able to eliminate a component of the location variable from collected atmospheric data. A balloon could be less at mercy of crosswinds and be able to collect more geographically accurate data, like ozone across and directly above a large city, airport, or anywhere. I designed a frame that would work like a sail boat to guide the weather balloon through the air using wind. I studied designs of existing balloon apparatuses, helicopter rudders, sail boats, and using basic physical knowledge I employed appropriate systems of dynamic control. To test the apparatus, I applied wind and pulled on strings attached to the moving parts to see how it responds. Hard results are pending as construction isn't 100% complete. Basic principles of aerodynamics tell us that the apparatus will work.

Religion

74. Deborah and Huldah: A Literary Analysis of Hebrew Bible Figures Used to Support Women's Preaching Rights
Caroline Collins '19
Sponsor: Dr. Laura Hobgood 3:45 pm

One of the most important steps in changing a denomination's theological policies is looking at Christianity's central text for guidance, the Bible, composed of both Hebrew Scriptures and the Christian New Testament. Protestant denominations in support of women's preaching rights found Biblical stories of certain figures that provide positive accounts of female leaders as evidence for women's right to preach; some of these women even held unique positions of authority who spoke on behalf of YHWH (Yahweh). In this research paper, I will be doing a literary analysis of Deborah and Huldah from the Hebrew Bible, along with some highlights of female leaders from Paul's Apostolic Ministry. In my analyses, I will be focusing on the positive interpretations, while acknowledging counter-

arguments and unanswered debates, supporting the validity of Deborah and Huldah's prophetic roles through Hebrew translations and socio-historical method. To conclude, I will discuss the theological debate behind women's authority to preach, according to the Bible, and elaborate on the importance of using the Hebrew Bible for theological debates in a Christian context.

FW Olin Building – Room 222

History

75. Preconditions for Women's Suffrage in Western Europe and the United States
Benjamin Garcia '20
Sponsor: Dr. Melissa Byrnes 1:15 pm

In today's world, the majority of people in western society accept the concept of universal suffrage. However, this has not been the case throughout most of human history. In fact, in most western countries it was over one hundred years after the introduction of men's suffrage before women's suffrage was made law. Many believed that the success of women's suffrage movements was contingent on the increase in women in the work place. However, as Joan Scott and Louise Tilly showed in their 1976 essay "Women's Work and the Family in Nineteenth-Century Europe," the number of women in the workforce did not increase in the years leading up to, nor in the years immediately after, female suffrage. Yet this suggestion is contrary to human rights trends in world history. Namely, that human rights have almost always been granted to people because of the labor, or other services, they provide to the country. This trend is exemplified by the writings of enlightenment political thinkers and philosophers, who used the labor and other services that minority groups provided to the state to justify extending political rights to them. This paper seeks to rectify this seeming contradiction by remembering that women did in fact complete work, this work was simply confined to tasks regarding the household and the raising of children. Using primary sources and recent scholarly works this paper proposes that there was an increase in the importance placed on this work by the state which facilitated the success of female suffrage movements.

76. New Truth: Transgender Lives and Identities at the Turn of the 20th Century **C**
Isabel Mandelbaum '19
Sponsor: Dr. Jessica Hower 1:30 pm


My Honors Thesis in history explores transgender identity in the late 19th and early 20th centuries. I was drawn to this topic personally and professionally, first, because I am transgender; second, because I perceived of a lack of scholarship on those who are transgender, especially before the mid-twentieth-century. I carried out my research this past summer while completing an internship in Washington, DC, sponsored by SU. There, I had unprecedented access to archives and rare books that I used extensively. My project has evolved and improved over these past two semesters. At RCWS, I would like to present my findings in the form of several profiles of individual trans people: their lives, their conceptions of their gender, and the way they lived in the world before the word "transgender" was coined. The most detailed of these is Lili Elbe, the first woman to receive gender confirmation surgery. Popular and even many scholarly conceptions dictate that being trans is a modern phenomenon, that earlier stories cannot be recovered, or that trans people were miserable and unable to express themselves within their lifetimes. My work demonstrates instead that trans people were rich, fascinating lives and, by that examination, I am extending the lineage of trans history.

Sociology and Anthropology

77. Skin Tone, Colorism, and Colorblind Racism in the Age of Trump
Molly McConnell '20
Sponsor: Dr. Reginald Byron 2:00 pm

This study aims to investigate whether one's skin tone is related to their beliefs about race and socioeconomic mobility. Using data from the 2012-2016 General Social Survey, I find that skin tone does have a statistically significant impact on one's beliefs about race and socioeconomic mobility (although, when disaggregated, this pattern only remained true for white Americans). I use theoretical arguments centering on colorism, internalized


racism, and the social construction of whiteness to contextualize white participants' racially-distinct perceptions of mobility. My results set the stage for an understanding of the ways in which colorism, internalized racism, and skin tone go hand in hand to support white hegemony in the age of Trump.

78. "Medically Policing Black Female Bodies": Black Women's Experiences with Birth Control 
Savannah Scott '19
Sponsor: Dr. Maria Lowe 2:15 pm

Reproductive health care, historically and currently, is not equal for every woman in the United States. The medical subfield of gynecology was built on the torture of Black female slaves, eugenics programs led to the forcible sterilization of thousands of Black women until the 1970s, and doctors today are less likely to believe Black women's health concerns. This project utilizes nine qualitative interviews with Black women recently prescribed birth control in order to examine the experiences they have seeking birth control from their physicians in Austin, Texas. Austin has seen its Black population decline due to rapid gentrification. Texas has also witnessed a swift decline in family planning services in light of anti-abortion legislation passed in 2013. This legal infringement on women's rights and the displacement of thousands of Black female residents in Austin makes it clear reproductive rights have become a field in which Blackness and femaleness are being systematically threatened. My research revealed Black women's comfort level going to an OBGYN, the experiences they have with physicians, and their treatment outcomes are shaped not only by race, gender, and socioeconomic status, but also by historical trauma, mental health, and their access to medical insurance and sex education. These findings highlight the need for a holistic, compassionate approach to women's reproductive health care that acknowledges the historical traumas Black women embody in and out of medical atmospheres and the need to educate and better equip medical staff to treat women whose intersectional identities may lead to increased health risks.

79. "The Classroom is Sacred": Academic Masculinity in Response to Texas' Campus Carry Law
Veronica Ciotti '19
Sponsor: Dr. Maria Lowe 2:30 pm

This study examines how male professors in Texas at a large public university perceive S.B. 11, informally known as the "campus carry law," and the ways it affects their own sense of safety and their interactions on campus. Previous research has surveyed student and faculty opinions of campus carry laws, but few studies have taken an in-depth, qualitative approach to the issue and specifically centered masculinity in its analysis. Given the connection between masculinity and gun-related behaviors and attitudes, I interviewed thirteen male faculty members at the University of Texas at Austin from March through October of 2018. Findings reveal that the discourse of what I term "academic masculinity" varies from more traditional masculine responses to challenges to safety, specifically hegemonic masculinity, in that academic masculinity typically does not entail carrying a gun as a response to feeling threatened. Instead, these professors are critical of hegemonically masculine justification techniques for carrying guns, and feel that the university space should be uniquely safe and gun-free, even when other public spaces are not.

80. Performing "The Handmaid's Tale": The use of Dystopian Literature at Political Protests 
Madeline Carrola '19
Sponsor: Dr. Maria Lowe 2:45 pm

This research examines women's use of the notable red and white handmaid costume from Margaret Atwood's *The Handmaid's Tale* at political demonstrations following the 2016 presidential election. Relying on ten in-depth interviews, my study finds that the 2016 election served as a critical turning point for respondents' feminist organizing. Interviewees began to use the handmaid costume at political protests because they increasingly saw parallels between the U.S. and Gilead, the totalitarian society in Atwood's novel. The costume is further seen by respondents as a tool that allows them to represent other women whom they believe may not have the privilege to participate in such protests and to raise awareness around a variety of women's issues. This study extends existing scholarship on social movements and women's activism in the United States by exploring interviewees' reasons for involvement and their creative use of dystopian storylines in popular culture for performance activism.

- 81.** "Letting the Teachers Speak": Teachers' Perspectives on the Special Education Identification Process in Public Texas Elementary Schools
Brielle Read '20
Sponsor: Dr. Maria Lowe 3:00 pm

While the quality of public education has started to become a more relevant issue within the last few years, one aspect of public education that is often still skimmed over is special education. While the area of standardized testing in terms of special education is sometimes an issue discussed, the identification and placement process for special education students as well as the quality of the education they receive once they are in the program is something often neglected. This paper/presentation will answer the question, "What factors affect special education identification and the quality of special education programs in public elementary schools in Texas?" I explore this question by using a qualitative study consisting of 9 in-depth interviews, all conducted between March and October 2018 with teachers who teach in public, elementary special education settings in Texas. Data findings suggest that from the perspective of special education teachers, there are three factors that greatly influence both a child's placement in special education and the resources and attention that they receive, these three factors consisting of parental involvement on behalf of the student, the race and socio-economic status of the student, and the presence of Parent Teacher Associations (PTAs) in the schools.

- 82.** Gendering the Boy Scouts: Examining Hegemonic and Hybrid Constructions of Masculinity at a Co-Ed Backpacking Camp
Samantha Pentecost '19
Sponsor: Dr. Maria Lowe 3:15 pm

This study examines the ways in which physical spaces and interactions between employees construct a hegemonically masculine space. While hegemonic masculinity has been identified in the outdoor education, ecotourism and forestry industries, little scholarship on this topic has been focused in the United States, and few studies have examined how physical space contributes to masculinity's construction in organizations associated with nature and the outdoors. This paper relies on nine in-depth interviews and sixteen hours of ethnographic research at Mountain View Scout Camp, a large-scale backpacking program for youth operated by the Boy Scouts of America. Participant observation took place during two weeks in the July and August of 2018, while interviews were completed from April to October of 2018. Findings indicate that hegemonic masculinity is deeply entrenched in both the physical spaces of the camp and in interactions between men and women staff members. Findings also indicate that men employed at Mountain View will at times embody a hybrid masculine style, pulling on non-hegemonic traits of masculinity by showing support for women's struggles. However, in doing so they subtly fortify symbolic differences between men and women employees.


- 83.** Juggling Two Worlds: Documented Siblings of DACA Recipients
Carmen Hernandez '19
Sponsor: Dr. Maria Lowe 3:30 pm

This study investigates the experiences of siblings of DACA recipients and how their sibling's documented status affects the recipient, the sibling, and their family as a whole. Sociological scholarship articulates the experiences of DACA recipients, but scholarship does not focus on the siblings of those recipients. But what do these siblings of the DACA recipients' experience? And how do these experiences affect their lives and relationships with their families? This research explores the experiences of siblings of DACA recipients and how that has affected their social activism, their relationships with their sibling and family, and the amount of discrimination they have faced for being Hispanic and for their different documented statuses. Relying on six interviews conducted from February to November 2018. The paper finds three general trends. These general trends are one; discrimination based on legal status, barriers to certain institutions, opportunities, and social locations based on a documented status. Two; DACA siblings role as a "mediator between two worlds" or informant. And three; how fear of deportation affects the everyday lives of DACAmented and documented family members. This paper adds to existing literature by examining the experiences of siblings of DACA recipients. It also identifies the experiences that the siblings have with their whole family and feeling as though they cannot do many things based on their families' legal status. It also focuses on the sibling's own fears or feelings towards what their family is going through and how this affects their entire family in the end. My research focuses on how legal status can have an effect on someone's individual relationships with their sibling as well as their environment as a whole.


- 84.** "Can't I Just be Both?" : Dual Identities with North African Ethnicity and French Nationality
Marta Zuzeviciute '19
Sponsor: Dr. Maria Lowe 3:45 pm

Previous literature has addressed the ways in which individuals of North African descent have been portrayed in French society as well as the tensions surrounding 'cultural wars' or multiculturalism in France. However, few have considered the personal voiced experiences and perceptions of French-born individuals of Arab ethnicities in the current political climate of French society. This study explores how French-born individuals of North African ethnicities perceive and experience their dual cultural and ethnic identities in France and how French-born individuals not of Arab ethnicities perceive life for French-Arabs at a time when inter-ethnic tensions appear to be increasing in France. Using data from twelve semi-structured in-depth interviews conducted from April to November 2018, three major themes are established and explored in this research. Findings emphasize the perceptions on the role of the French media in perpetuating stereotypes and distorting the image of Arab and Muslim identities. In addition, with two or more cultural and ethnic identities, French-born respondents of North African descent very often experience societal or communal pressures to choose adherence to one cultural identity over another. Lastly, the findings reveal that while French-Arabs experience discrimination in various spaces, the most prevalent space where racism and discrimination are experiences is in the labor market or while searching for jobs.

Classics

- 85.** Roman Historians and Influential Women 
Jake Stagner '20
Sponsor: Dr. Halford Haskell 4:00 pm

At many points in the long history of the Roman Civilization, the actions of women played a pivotal role. From the Intervention of the Sabine Women to the shadowy dealings of Livia, women and their characters were portrayed by the influential Roman Historians of their ages. However, these historians were not free from prejudice and other influences on an unbiased work of history. By looking at their works, we can begin to understand their views on women and how they crafted the characters of these women. While the men of this period had "characters" created for them, the women in this period had to contend with the historians prejudices against women. In this presentation I analyze the works of four influential Roman historians, Cassius Dio, Livy, Tacitus, and Suetonius, and look to understand how their positions as historians have shaped the portrayals of powerful women like Messalina, Livia and Agrippina the Younger. Throughout my research, I find that their prejudices against women, especially powerful women in the imperial court, prevented them from writing a comprehensive and unbiased history of the Roman people.

- 86.** Hadrian's Wall and Romanization in Northern Britain 
Michael Broyles '19
Sponsor: Dr. Halford Haskell 4:15 pm


Jupiter in the Aeneid stated that Rome would have "imperium sine fine," or an empire without borders. Britain had been subjected to invasions by Augustus Caesar (55 B.C.) and Julius Agricola (A.D. 79 - A.D. 83) in the past. In 128 A.D. Hadrian halted the previous emperors' expansions, both in the east and also in Britain with a wall. This was a pivotal point in the history of the Roman Empire. Hadrian's Wall created a unique flow of Roman culture into Northern Britain by establishing the Roman military as the only true hierarchy in the region. The cultural influence of the military settlements forced a new way of life onto indigenous people by undermining traditional ideas and forcing them to conform to the Roman way of life. This paper uses archaeology, ancient sources, and previous research to argue that Hadrian's Wall acted as a catalyst for Romanization to bring prosperity to the land through instating what Rome believed to be a "superior" culture at a detrimental cost to the local population.

Environmental Studies

87. Contaminating in Cambodia: The Growth of Food Insecurity
Karonech Chreng '20
Sponsor: Dr. Joshua Long

1:15 pm


Even though the residents in Cambodia's capital city, Phnom Penh, have been gaining access to a more varied and greater supply of food in the city's marketplaces, their sense of food insecurity has recently been increasing, not decreasing as one would expect. Their insecurity stems from their growing awareness that many of their food choices are not safe to eat. In 2016, Switzerland's Federal Food Safety and Veterinary Office tested vegetables and spices imported from Cambodia and Thailand and found that 53% were contaminated with unacceptable levels of pesticides or trace amounts of banned weed killers. In that same year, there were over 1,000 reports from across Cambodia of people becoming ill from the food they ate. My study will investigate the causes of the contamination and how it developed over time. I will examine the roles that lax governmental food quality regulations, labor migration, extensive importation of Chinese labor to construct Chinese-funded structural improvements, land grabbing, and the difficulty of finding reliable food sellers that do not sell food heavily contaminated with pesticides all played in the buildup to the current situation. I will make use of survey results from Phnom Penh residents and utilize insights gained from empirical research to reach my conclusions.

88. Examining the Role of Activism & Action in American College Campuses: A Case Study of Southwestern University 
Camille Soto '19, Hannah Winkler '19, and Simone Yoxall '19
Sponsor: Dr. Joshua Long

1:30 pm

Activism on college campuses has a long, storied history. In recent years, highly visible student protests surrounding issues such as income inequality, police brutality, indigenous rights, sexual assault, and climate change have garnered significant media attention. Although universities often bring together elements that allow student activism to flourish, they also present their own set of internal challenges. With every class that graduates, student activist groups contend with changing leadership, reduced membership, and the potential loss of institutional memory. Histories of student resistance, conflict, and activism may be erased from — or in some cases co-opted by — official institutional records. Thus, the challenge of passing knowledge down poses significant hurdles for any kind of ongoing activist work. This Environmental Studies capstone paper responds to this ongoing loss of institutional knowledge by chronicling a counter-history of student and faculty commitment to activism at Southwestern University. Using a combination of archival and quantitative research, including interviews with faculty, staff, students, and alumni, we examine the interactions between different activist movements on campus and identify the specific barriers to student activism present at Southwestern. By reclaiming this history of activism at Southwestern University, this paper seeks to outline activism trends at SU and provide a resource for students to use in future activist work.

Political Science

89. A Path-Dependent Explanation of Divergent Nuclear Trajectories 
Conner Joyce '19
Sponsor: Dr. Robert Snyder 2:00 pm

Current scholarship offers several models to account for the occurrence of nuclear proliferation. Each of these models attempts to identify a primary causal variable that explains why states choose to pursue nuclear weapons. The purpose of this study is to supplement the logic of an existing model: the security model. Utilizing most-similar comparative case study analysis of Israel and South Korea's nuclear programs, this paper suggests that relative degrees of dependency during post-war recovery periods determine the propensity to proliferate. This project will employ a path dependence analytical lens to assess this hypothesis such that the respective paths of recovery will be tested as a determinant. It is expected that the high-dependence recovery of South Korea in the years after the Korean War generated preference for third-party security commitments through two mechanisms: domestic political pressure and bureaucratic inertia. On the other hand, Israel's largely independent reconstruction following the 1948 War of Independence allowed for resistance of foreign impositions and the pursuit of "self-help" mechanisms of security i.e. nuclear weapons.

90. First Year in Review: SU Project for Free Speech and Civil Discourse
Danyale Kellogg '19 and Camille Martin '19
Sponsor: Dr. Paul Secord, University Relations 1:45 pm

Through the Project for Free Speech and Civil Discourse, seniors Camille Martin and Danyale Kellogg have completed efforts on campus encouraging students to engage in civil discourse. In a focus group conducted by Martin with a sample size of 40 students, participants overwhelmingly expressed the need for more spaces to talk about politics on campus. Students noted that in reality, when they talk about politics with friends, oftentimes the same political opinions are discussed. In an effort to increase political discourse on campus between students who do not necessarily agree politically, several events have been put on and have been highly attended by students. In the fall, the event 'Georgetown on the Table' brought a turnout of over 70 students. At this event, space was given for students to talk about what they would like to see different in Georgetown by the year 2030. Table Talk events encourage students to discuss current issues, like the role of media in politics, over dinner and on the premise of engaging in respectful, friendly disagreement. A screening of the film Bring It to The Table, which challenges audiences to listen and try to understand those who disagree with them, was also hosted by this program. Breakfast Taco discussions have also been an avenue for students to talk about current events in politics, all while eating breakfast tacos before class. Through the Project, Martin and Kellogg have enjoyed hosting events and are excited to see what will be done in the coming years.

91. Women's Representation in France and Albania: The Defect of Gender Quotas
Olivia Stankus '20
Sponsor: Dr. Alisa Gaunder 2:15 pm

In both France and Albania, candidate gender quotas have been implemented as a mechanism for increasing women's numerical representation in politics. However, women in both countries comprise less than twenty percent of the national legislatures, despite accounting for over fifty percent of the total populations. Given the implementation of gender quotas, why has female numerical representation remained low? More specifically, how have France and Albania not accrued the expected increase in women's representation after implementing gender quotas? This paper explores these questions through the comparative method, and employs a most different system to account for Albania and France's opposing electoral systems, institutions, political actors, and histories. The paper argues that women's numerical representation in France and Albania remains low due to political elites' failure to ensure that parties adhere to electoral laws and their refusal to implement non-compliance sanctions.


92. Abortion Policy in Ireland and Malta: The Effects of the Changing Influence of Catholicism

Emily Tesmer '20

Sponsor: Dr. Alisa Gaunder

2:45 pm

In the last several decades safe and legal access to abortion has substantially increased in many developed democracies worldwide. Abortion policies provide a lens to analyze women's social status and position within a given society. While access to abortion has largely been legalized in many democracies, Ireland and Malta are two developed democracies that challenge this international trend. Ireland recently legalized abortion in May of 2018, and Malta is one of the only democracies where abortion is still completely illegal. Thus, why is abortion legal in Ireland but illegal in Malta? This paper explores this question using the comparative method and establishing a most-similar system between Ireland and Malta to analyze the factors that explain why abortion is legal in Ireland and illegal in Malta. This paper examines factors such as Catholicism, women's movements, and international norms and maintains that the influence of Catholicism is the most important factor that impacted attitudes towards abortion and abortion policy in these two countries. This paper asserts that historically the Catholic Church influenced cultural norms and attitudes towards abortion in both Ireland and Malta creating conservative abortion policies; - however in Ireland the Catholic church's power and influence on Irish society has waned considerably recently, yet it still has considerable power in Maltese society, resulting in Ireland legalizing abortion and Malta maintaining that abortion is illegal.

93. Undoing the Feminist: Surveying the Behavior of Neoliberal Feminism and Testing Theory in Practice 

Camille Martin '19

Sponsor: Dr. Emily Sydnor

2:30 pm

A new trend is on the rise: women are practicing a new form of feminism, which revives some and displaces other aims and ambitions of liberal feminism. This new feminism is being called "neoliberal feminism." Neoliberalism describes phenomena where market-place rationalities reorganize the social and political world, where practices of government and of citizenship realign to best fit market-based values and metrics. Just as neoliberal rationalities cause for a new organization of the social, neoliberal rationalities presently mobilize a new type of feminism, as well as a new feminist subject. Now, this subject not only disavows the social, cultural, and economic forces producing gender inequality, but also accepts the "full responsibility for her own well-being and self-care," by crafting a "felicitous work-family balance based on a cost-benefit calculus," to reflect neoliberal rationalities (Rottenberg 2014, 420). Through survey methodology, the behavior of this new feminist subject is tested to determine what type of feminist subject can ascribe to the practices of neoliberal feminism. This research demonstrates that the ideas of neoliberal feminism are attractive to and inform the behavior of white upper-class women, ultimately recreating the problematic exclusions of liberal feminism. Further, I evaluate the attitudes and implications of 'neoliberal feminism' to see exactly how practices of feminism are becoming 'undone' by neoliberal political rationalities.

94. The Power of Red Women: Communist Propaganda in the Soviet Union and China

Megan Nair '20

Sponsor: Dr. Alisa Gaunder

3:00 pm

The Soviet Union and PRC were formed on similar theoretical and political grounds. Stalin and Mao accumulated power and constructed totalitarian regimes on the basis of egalitarianism, but gender roles for women in the Soviet Union and PRC varied greatly. How do portrayals of women in Chinese and Soviet Union communist propaganda differ, and how does this affect the definition of gender roles in totalitarian states? Examining the government propaganda and media portrayal of women is a key to unlocking why women's roles were so different during Mao and Stalin's rule. This puzzle will be a similar systems comparative area study of the historical communist regimes in the People's Republic of China and the Soviet Union during peak communist leadership (under the reigns of Mao Zedong and Joseph Stalin). I will examine Soviet Union and PRC government propaganda like posters, radio broadcasts, leaflets, junk science, and government-issued statements that depict female representation and gender roles. I will then look at the gender roles constructed under the regimes of Mao and Stalin, and examine how the depiction of women in PRC and Soviet Union government issued media led to a difference in gender revisionism between the two totalitarian states. The paper argues that the difference in state-issued and implemented communist propaganda during the regimes of Mao and Stalin changed women's roles between the states.

95. Post-Soviet Women's Parliamentary Representation: Latvia and Lithuania

Avery Beam '19

Sponsor: Dr. Alisa Gaunder

3:15 pm

Using a most-similar case design to compare Latvia and Lithuania, this study examines the role electoral systems play in affecting greater representation of women in post-Soviet democracies. After Latvia's most recent election, Latvia demonstrated a much higher percentage of women in its parliament (31%) than Lithuania (21%). Interestingly, in spite of having higher descriptive representation, Latvia has no quotas or women's organizations/caucuses while Lithuania implements voluntary quotas and has a prevalent women's caucus. This study advances an institutional argument, hypothesizing that the Latvian parliament's higher percentage of women can be attributed to its proportional representation electoral system. Lithuania has a mixed system that has favored a majoritarian pole and resulted in party fragmentation, which in turn, has adversely affected women's electoral success. In many ways, women's substantive representation in Latvia and Lithuania is only marginally different. However, in regard to the sheer number of women in parliament, the difference between Lithuania and Latvia proves relatively marked. The Latvian and Lithuanian cases demonstrate that proportional representation electoral systems are more favorable to women candidates than mixed systems, even in the absence of quotas and a women's movement and particularly in the context of post-Soviet democracies.

96. Varying Success in 50% Ballot Gender Quotas in South Korea and France

Meredith Rasmussen '19

Sponsor: Dr. Alisa Gaunder

3:30 pm

I am examining the gender quota policies in both South Korea and France and comparing their effectiveness in electing women into parliaments. Both countries have legal quotas that mandate all presented ballots must contain 50% female candidates and that party lists alternate between male and female candidates. However, there are not severe repercussions for non-compliance, and in these cases, there are only financial sanctions on non-complying parties. I will be examining the effectiveness of 50% gender quotas in two of the only countries that have them as a legal standpoint and pose the question of having a high (or even) threshold really translates into a larger difference in women's representation in legislatures. Despite having high gender quotas for ballots, France and South Korea still have relatively low levels of female representation and have not met their target of gender parity in the years following the implementation of gender quotas in 2000. I will be using the comparative method to examine why France is reaching higher levels of gender parity in their parliament, but South Korea has yet to reach higher percentages. I will examine how effective financial sanctions for non-compliance have been, the socio historical context of the two countries and how that affects women's representation and argue that the roles of political parties in non-compliance to the gender quotas is the greatest barrier to larger numbers of women in parliament.

97. How Leaders Manage Media Coverage: The Cases of Germany and France

Laura Rativa '20

Sponsor: Dr. Alisa Gaunder

3:45 pm

In most countries around the globe, women running for the highest political office face multiple obstacles that ultimately stop them from obtaining executive office such. Ségolène Royal ran for president of France in 2007. France has a multiparty system and since none of the candidates obtained a majority (50 percent plus one) in the first round, a second round between the two leading party candidates, Ségolène Royal and Nicolas Sarkozy, took place. Nicolas Sarkozy won executive office in France by only 6.12 percent of the votes. The current chancellor of Germany, Angela Merkel, who ran for executive office first in 2005 also ran in a multiparty system and won executive office as part of one of the leading parties. While these countries share many similarities, the media coverage of the two leaders' campaigns differs greatly. This paper explores why the campaign media coverage differed through case studies of Ségolène Royal in 2007 and Angela Merkel in 2005. The case studies will explore the extent to which gender double binds and gender stereotypes impeded their campaign efforts. The paper maintains that through her individual agency Angela Merkel could control the media in the 2005 Germany executive elections more than Ségolène Royal in the 2007 France executive elections.

98. The Ways of Women
Breely Peterson '21
Sponsor: Dr. Alisa Gaunder

4:00 pm

Women's representation in the political realm is an increasing topic of research, with a record number of women in the United States Congress this year and many women in executive positions around the world. Yet, there are still countries with staggeringly low numbers and even those with high representation fail to meet the goals of the women who are in power. In this paper, I investigate why more gender policy outcomes were proposed and passed under Angela Merkel, the first woman Chancellor of Germany, than under Margaret Thatcher, the first woman Prime Minister of Great Britain. To do so I will compare the policies passed under both executives in terms of numbers and issues. There are many possible explanations that exist, including differences in their leadership, the number of women in their government, and their experience with in-group and outgroup biases. I expect that the difference in cabinet composition, specifically the number of women in the cabinet, will provide the best explanation for the differences in their policy outcomes. This is significant as it would provide us insight to what it takes to promote policies regarding women. Finally, this research is also significant because it reveals women are not homogenous nor rule nor come to power in one, exact way.


Latin American and Border Studies

99. The Shadow Beast Within: La Quinceañera as a Means of Cultural Resistance
Esther Ramos '19
Sponsor: Dr. Brenda Sendejo

4:15 pm

Scholars of Chicana Studies and folklore have documented how borderlands inhabitants use Chicanx traditions as forms of resistance. Today younger generations of Chicanxs also draw on Chicana feminist theories to understand their multiple identities— racial, sexual, etc.-- and employ cultural traditions in the name of social justice. For instance, on July 19th 2017, fifteen Latina girls, sponsored by the Latino civic-engagement organization, Jolt took over the capitol of Texas in full quinceañera attire in protest of the anti-immigration Senate Bill 4. Quinceañeras are also challenging formerly "traditional" aspects of the tradition by remaking the practice. Such actions reflect Norma E. Cantú's (2002) work on the quinceañera, which states that customs are a means by which a community can resist further erasure and assimilation. Drawing on an analysis of Jolt's Quinceañera protest and personal testimonial of my own quinceañera experience, I build on Cantú's assertion, illustrating how, while the quinceañera is a form of cultural resistance against oppression within dominant social U.S. norms, it is also a mode of resistance against traditional Mexican customs. Using a theoretical framework anchored by the work of Maria Lugones (2005) and Gloria Anzaldúa's concept of the Shadow Beast (1987), I analyze the quinceañera as a mode of rebellion against various social and cultural constraints. I show how the quinceañera provides an avenue for the Shadow Beast to emerge and for Chicanxs to claim their own identities that challenge the constraints of either culture, thereby creating a third space of contestation, negotiation, and identity formation.

Political Science

100. Ideology in Russia's Clash with the West 
Avery Beam '19
Sponsor: Dr. Robert Snyder

4:30 pm

International relations scholars have generated various theories about Russia's current global actions and interests. Many argue that Russian policy is largely deficient in terms of ideology, posing agency and institutional factors as explanations for the Kremlin's behavior. However, a study of the political documents and statements of Putin and his party, as well as an examination of nationally held beliefs, demonstrate the presence of a new ideology – one that can be used to effectively explain the Kremlin's increasingly audacious and antagonistic foreign policy. This study has found that Russia's ideology appears to consist of five interrelated elements: expansionism, nationalism, authoritarianism, Soviet nostalgia, and opposition towards the West and Western political thought. Crucially, the Kremlin's new ideology is reflected in not only the political language of Putin and his associates, but also in the normative attitudes of the Russian citizenry. Assessing Russian foreign policy requires understanding not only the Kremlin's overarching goals, but also the political ideology behind them. Although much has been written on the influential elements that shape Russian foreign policy, this project argues that the role of ideology is largely

underestimated, and the recent emergence of ideological conflict acts a foremost causal factor in explaining Russia's hardline reassertion in the international arena.

FW Olin Building – Room 322

Modern Languages and Literatures Department

101. La diferencia que hace un cambio de vestuario: Un análisis de El delantal blanco (*Spanish Presentation*)
Violeta Bueno '19

Sponsor: Dr. María Ángeles Rodríguez Cadena 1:15 pm

The play *El delantal blanco*, was written by Chilean author Sergio Vodanovic in 1956. Sergio Vodanović was a very well-known playwright, known for the plays that he produced. Aside from being a playwright, Vodanović was also a journalist, lawyer, professor, a critic and screenwriter for theater productions. This analysis of *El delantal blanco* focuses on the central theme of social classes and how they are represented in society as well as in the play, which can still be seen to this day in some Latin American countries. The use of elements such as 'plano espectacular' and the 'incidente' throughout are used to analyze the social class stratification. In addition, *El delantal blanco* serves as a model to represent the injustices that exist within the social class system. Overall, this play portrays the everyday life of so many people living in Latin America and the issues that they deal with.

102. NATO First, Germany Second?: The Future of German National Security in the New Age of "America First"
Danyale Kellogg '19

Sponsor: Dr. Erika Berroth 1:30 pm

This paper was written in light of pointed accusations by some American policymakers and President Donald Trump that the Federal Republic of Germany does not contribute enough, monetarily or otherwise, to the North Atlantic Treaty Organization (NATO). Using historical and statistical analysis, it examines the foundations of Germany's modern Bundeswehr and its restrictions, modern Federal Ministry of Defense objectives, origins of German foreign policy stances, the international position Germany has been boxed into since the construction of the post-World War II world order, the nature of NATO funding, and the goals of Germany as a major power in a shifting international arena and security landscape. It also compares the contributions of Germany to those of other NATO countries, explains what a country gets when it dedicates a higher percentage of its GDP to defense, and explains why a sudden increase in defense spending on the part of NATO member countries who currently do not meet the 2% of GDP goal would likely not actually benefit the Alliance. Ultimately, this paper explains that Germany remains a committed ally both to the Alliance and to the United States, though it is looking to secure a more stable, self-sufficient future for itself.

103. Poetas Principales de Modernismo Hispanoamericano en Canción de otoño en primavera y La pregunta (*Spanish Presentation*)
Alexandria Bell '21

Sponsor: Dr. María Ángeles Rodríguez Cadena 1:45 pm

In this presentation, I will determine certain similarities and differences in structure and theme of the poems *Canción de otoño en primavera* and *La Pregunta* written by the impactful and well-known Hispanic modernist poets, Rubén Darío and Amado Nervo, respectively. I begin with a background on each poet and a brief discussion of their significance to the world of Hispanic literature. Then, I analyze *Canción de otoño en primavera*, where Darío explores the theme of the loss of youth and highlights the loneliness that often accompanies such loss. While the themes explored in *La Pregunta* are seemingly unrelated since they deal with finding a purpose in life and understanding the power of destiny, because of the influence of modernism on both works, they are related in how they imaginatively deal with the mundane problems of everyday life. Lastly, I reflect on important details of each poem, relating them back to my own life and expressing how they allow a glimpse into the internal worlds of each of these prolific poets.

104. The Themes of Death and Nationalism in the Poem *Dos Patrias* by José Martí (*Spanish Presentation*)
Dominique Rosario '20
Sponsor: Dr. Maria Ángeles Rodríguez Cadena 2:00 pm

My essay focuses on the themes of death and nationalism in the poem *Dos Patrias* by José Martí. In this essay, I explore the social-historical context of the poem through the War of Independence between Cuba and Spain in order to better understand the author's feelings of having dual citizenship during this time. José Martí had Spanish parents but was born in Cuba. Martí was an important figure in Latin America during his lifetime and was a political activist in favor of the independence of Cuba. Because of the background and experiences of Martí, the feelings of nationalism one has for their country, as well as feelings surrounding war are conveyed in a very personal way. In addition to the themes and historical context of the poem I also focus on and analyze the author's use of symbols in the poem. Martí's use of symbols such as the sun and the night allow for the creation of a more meaningful poem full of emotion of the author's life experiences.

105. *Y las madres que opinan?* (*Spanish Presentation*)
Valentina Olivieri-Puentes '19
Sponsor: Dr. Maria Ángeles Rodríguez Cadena 2:15 pm

In my essay, I analyzed the essay "Y las madres que opinan? La importancia de las mujeres" by Rosario Castellanos. I looked the importance of acknowledging of mothers not just as vessels to carry a child, but actually that they are human beings with emotions and dreams of their own. I focused on certain literary figures that aided Castellanos to convey her feminist views during the 1950s in the patriarchal society of Mexico.

106. Inclusion of Students with Learning Disabilities in The German School System
Melina Boutris '21
Sponsor: Dr. Erika Berroth 2:30 pm

While the public education system in the US integrates those with disabilities, the German education system does not and remains mostly segregated. In Germany, these students are taught separately from their peers in *Sonderschulen* (Special Education Schools). As a student with a learning disability, classified as "in need of special education", the presenter completed public high school in the U.S. with her nondisabled classmates. At the same time, she was a member of "National Honor Society", took an AP course and is now studying Education and German. As a first grader, in Germany, with a learning disability and auditory processing disorder, she would have been forced to attend a *Sonderschule*. Beyond the social stigma, she would have probably been able to get a *Hauptschulabschluss* (lower secondary school certificate) and would have been unable to attend a University. Approximately 80% of special education students who are in these Special Education Schools, do NOT complete their *Hauptschulabschluss* (lower secondary school certificate). They are the "losers of the German public school system". Inclusion has been officially practiced in Germany since 2009, but with marginal success.

Chemistry and Biochemistry Department

107. San Gabriel River Research **K**
Scout Gockel '22 and Nicole Rajtak '22
Sponsor: Dr. Willis Weigand 2:45 pm

Recently, Georgetown's San Gabriel River has been involved in a controversy surrounding the new Liberty Hill Wastewater Treatment Facility. The Texas Commission on Environmental Quality has documented several violations regarding the facility's discharge of effluent into the river, and residents speculate that this contamination may be to blame for changes in the river's overall appearance. In an effort to determine the extent of the contamination, water quality data was collected from a total of five locations along the river. Two of these sites were upstream of the Liberty Hill facility, another directly downstream, and the last two were farther downstream, in Georgetown. At each site, the following parameters were recorded: nitrate concentration, phosphate concentration, and dissolved oxygen concentration. Samples of fecal coliform bacteria and aquatic macroinvertebrates were also collected from each site and counted/identified. Collection of chemical and bacterial data was conducted on three separate occasions, while macroinvertebrate samples were only collected once per site. This ongoing program has not only monitored the

quality of the San Gabriel, but also raised awareness of the wastewater controversy, and provided Southwestern students with a unique opportunity to conduct field research outside of class.

108. Formation and Stability of Triplex DNA Containing an Abasic Site **S**

Rachel Fray '19

Sponsor: Dr. Maha Zewail-Foote

3:00 pm

B-DNA is the most common form of DNA and forms a double helix structure. However, certain DNA sequences are capable of forming alternative structures, collectively known as non-BDNA. Triplex-forming sequences, which are capable of forming a three-stranded DNA structure, are abundant in the human genome and often localize with mutation hotspots. These triplex-forming sequences are mutagenic in mammalian cells and a source of genetic instability contributing to many diseases such as Burkitt's lymphoma. One explanation for the non-B DNA-induced mutagenesis is that these triplex structures may be hotspots for oxidative DNA damage, a source of mutations. We investigated the impact of DNA lesions located within a triplex-forming sequence from the c-MYC gene on triplex DNA formation and stability. Our results suggest that basic sites at certain locations within the triplex-forming sequence can alter the stability of the triplex structure. Overall, our results provide insights into the impact of DNA lesions on the biological effects of triplex DNA structures and genetic instability.

POSTERS

4:00-5:00 pm

Bishops Lounge – McCombs Campus Center

Biology

109. Bullseye! Hitting the Target on Primer Optimization
Shellsea Miller '20 and Lauren Muskara '20
Sponsor: Dr. Romi Burks

Environmental DNA (eDNA) offers a powerful conservation tool by looking at the genetic material shed by an organism into its abiotic environment without having to observe the actual organism. Successful detection of eDNA depends on a variety of factors, including primer design and qPCR conditions. To test for eDNA in filtrate from water samples (250 mL), we developed primers designed to amplify a non-native apple snail, *Pomacea maculata*. To create *P. maculata* specific primers, we used known sequences from the Folmer region of the cytochrome c oxidase subunit I (COI) of *P. maculata* as the template and developed four primers of varied length and location. All four primers successfully detected *P. maculata* from field samples, but we also wanted to confirm their specificity for only *P. maculata*. Consequently, we conducted several target experiments with tissue-derived DNA from other *Pomacea* species (e.g. *P. canaliculata*), other ampullariids, such as *Marisa cornuarietis* which belongs to the same family as *Pomacea*, and Japanese mysterysnails, *Cipangopaludina japonica*, a non-native invasive species of freshwater snail belonging to another family (Viviparidae). Optimizing our qPCR process currently involves increasing annealing temperature in 2° increments so that our primers only amplify *P. maculata* at higher temperatures, but amplify other non-native snails at lower temperatures. Amplifying multiple snails at lower temperatures would allow for the detection of multiple invasive snails using one primer, but higher temperature specificity would narrow the amplification to a specific target. Optimizing primer performance increases the accuracy of eDNA detection efforts and promotes its use in conservation ecology.

110. Highway to Shell: Troubleshooting Methods of Genetic Detection and Identification in Two Invasive Species, *Cipangopaludina chinensis* and *C. japonica*
Nicole Kelly '21 and Shannon Odell '21
Sponsor: Dr. Romi Burks

Cipangopaludina chinensis and *C. japonica*, i.e. Asian mysterysnails, represent invasive species native to China and Japan, respectively. First introduced to California in the 1890's, populations of both species subsequently appeared across the continental United States with strongholds in the Great Lakes and Northeast. These snails share morphological similarities, but represent distinct species genetically. To investigate whether our own finding of a Japanese mysterysnail (*C. japonica*) in Texas matched other collections where these snails occur, we requested samples from the Illinois Natural History Survey. Genetic sequencing requires consistent, quality extraction of total genomic DNA (tDNA) from snail tissue samples, some of which date back to 2004. Based on previous success with extracting apple snail (*Pomacea* spp.) DNA, we started with spin kits (Macherey-Nagel), which provided amplifiable species-specific DNA, but not sequenceable product (N = 55). Consequently, we switched to chloroform-isoamyl alcohol (24:1) extractions with hopes of generating better sequences. Quantification of DNA concentration of extracted samples (spin kit and chloroform) via a Qubit fluorometer provided a comparison of yields, but not a full sense of quality. So far, chloroform extractions appear superior to spin kits, as they yield statistically significantly higher DNA concentrations in both fresh and museum-preserved tissue samples. However, sequences of mysterysnails still do not reflect the quality of previous apple snail work. Thus, we want to explore qualities of samples that amplify well, but still fail to sequence properly. Collectively, these efforts will help us find genetic connections between Texas and other populations.

Chemistry and Biochemistry

111. Observation of Photobleaching Lifetimes of Cy3-alkyne and Cy5-alkyne Fluorescence

Ian Orantes-Orellana '19

Sponsor: Dr. David Cooper

Fluorescent dyes, such as Cy3-alkyne and Cy5-alkyne, are commonly used in a variety of biological techniques such as fluorescent tagging and smFRET (single molecule fluorescence resonance energy transfer) spectroscopy. The fluorescence of these dyes decays over time and may undergo a transition flip into the triplet state. When in the triplet state, an electron can react causing a permanent period of darkness known as photobleaching. Photoprotection systems such as a reducing and oxidizing system (ROXS; in this case a combination of methyl viologen and ascorbic acid) are often used to prevent the molecule from photobleaching. The ROXS provides a faster pathway for the electron to travel from the excited triplet state back to the ground state in order to keep the electron in the fluorescent cycle. Previous research has shown that ROXS significantly improved the fluorescence lifetimes of the Cy3-alkyne and Cy5-alkyne dyes at the single molecule level, however, the effects of individual ROXS components on bulk samples of Cy3-alkyne and Cy5-alkyne was previously unknown. This aspect was investigated in the current study to establish a technique that effectively prolonged the fluorescence lifetimes of these dyes, while concurrently determining more information about the ROXS solution. We subjected the dyes to photobleaching conditions with various ratio concentrations of ascorbic acid and methyl viologen in solution. By doing so, we were able to determine the optimum ratio concentrations of ROXS to solution for the Cy3-alkyne and Cy5-alkyne dyes.

112. Gold (I) Catalyzed Synthesis of a Novel Protecting Group

Justin McCormack '20 and Julianna Mouat '21

Sponsor: Dr. Michael Gesinski


Protecting groups allow chemists to perform transformations on one part of a molecule without affecting other functional groups, which provides feasible pathways in organic syntheses. An ideal protecting group would be stable under a wide variety of reaction conditions but easily cleavable using mild and specific reagents. We have developed a novel aryloxymethyl acetal alcohol protecting group that is stable under basic, acidic, and reducing conditions, is selectively cleaved with mild gold(I) catalysts, and is readily synthesized in two steps. The protecting group has been successfully coupled with primary and secondary alcohols, and optimization of the gold (I)-catalyzed deprotection is ongoing. Furthermore, the scope of alcohols tested by the protecting group continues to expand in regards to both the protecting and deprotection steps. In the deprotection step a 1-H isochromene was observed. Belonging to a greater class of biologically active molecules known as benzopyrans, these compounds and their isomers have been known to exhibit anti-leishmanial and antitumor properties. Exhibition of this biological activity therefore designates these molecules as potential templates for the design of anti-cancer and anti-parasitic agents. Ultimately, the 1-H isochromene has been isolated in good yields utilizing a variety of commercially available gold(I) catalysts. Current work is underway on optimizing the conditions for its gold(I)-catalyzed formation, as well as probing the selectivity of this reaction across a variety of ortho-alkynylbenzyl alcohols.

113. Titanium Mediated Synthesis of Cyclobutanones and 1,4-Diketones

Aimee Rodriguez '19

Sponsor: Dr. Michael Gesinski

Cyclobutanes are highly strained four carbon cyclic rings that are found in nature and used in organic synthesis. Due to the many naturally occurring cyclobutane derivatives containing pharmaceutical properties, it is of interest to develop ways to synthesize these cyclic rings. A novel method has been developed for the synthesis of substituted cyclobutanones and 1,4-diketones utilizing low-valent titanium intermediates. Cyclobutanones are generated when Grignard reagents are added to a mixture of tosylated cyanohydrins and titanium(IV) complexes. These "Kulinkovich reagents" act as 1,2-dicarbonyl intermediates resulting in good yields of the cyclized products. When α -haloketones are subjected to the same conditions, a homodimerization reaction results in the formation of 1,4-diketones. It has been shown that, under these conditions, the reagent undergoes a disproportionation reaction to afford titanium(III) intermediates leading to radical dimerization. This work demonstrates the dichotomous nature of these low-valent titanium reagents: depending on the substrate, they can function as 1,2-nucleophiles or radical initiators.

114. Determining Analyte Through NMR and IR Spectroscopy Software 

Elijah Ballesteros '21 and Luis Ramirez '21

Sponsor: Dr. Michael Gesinski

The software is a utility program developed to assist in the evaluation of mass, infrared, and nuclear magnetic resonance (NMR) spectra. With the utilization of JAVA software, the plots gathered from the IR, NMR, and mass spectrometers can be digitized. JAVA is essential in gathering and combining the data points that identify the unique characteristics of a molecule. The programming algorithm determines the molecular formula, functional groups and the degrees of unsaturation present in the molecule. The software code is capable of detecting the following functional groups: carboxylic acids, ketones, aldehydes, nitriles, esters, alcohols, alkanes, alkynes, and nitriles. This program becomes vital when quickly determining the chemical composition of an unknown molecule or an analyte. Determining the chemical composition of an analyte can be done by hand using the three types of spectra, however, that process is slow and inefficient. The purpose of the program created in this experiment is to efficiently and effectively process the spectra in a matter of seconds to produce the most possible constitutional isomers. Successful software will accelerate the evaluation of spectra and facilitate future research and lab experiments.

115. Factors Affecting the Phenolic Composition and Antioxidant Properties of Green and Purple Basil: Soil Bacteria, Herbivory, and Drought Stress

Lucas Ford '19

Sponsor: Dr. Emily Niemeyer

Basil (*Ocimum basilicum* L.) is a popular culinary herb that produces a variety of phenolic compounds with known antioxidant properties, and such natural sources of antioxidants within the human diet may be helpful in reducing oxidative stress. In this study, we investigated the effects of *Pseudomonas* soil bacteria on the development of phenolic compounds in green ('Sweet') and purple ('Purple Ruffles') basil cultivars. We also determined how the presence of *Pseudomonas* affected phenolic production in basil plants exposed to stressors such as herbivory or drought conditions. For each basil sample, total phenolic content was determined using the Folin-Ciocalteu method and antioxidant capacities were analyzed using the ferric reducing antioxidant power (FRAP) assay. Additionally, total anthocyanin content was determined for purple basil samples using a spectrophotometric assay. Initial results show significant differences in phenolic content, anthocyanin levels, and antioxidant properties among treatment and control groups. For example, purple basil subjected to drought stress had a higher total phenolic content than basil that received adequate watering. However, drought conditions did not have a statistically significant effect on the total phenolic content of green basil. This study will summarize how environmental factors such as soil bacteria, herbivory, and drought stress influence the phenolic composition and antioxidant capacities of green and purple basil cultivars.

116. Phenolic Content and Antioxidant Properties of Twelve Commercially Available Basil Essential Oils

Robert Meyer '21

Sponsor: Dr. Emily Niemeyer

The software is a utility program developed to assist in the evaluation of mass, infrared, and nuclear magnetic resonance (NMR) spectra. With the utilization of JAVA software, the plots gathered from the IR, NMR, and mass spectrometers can be digitized. JAVA is essential in gathering and combining the data points that identify the unique characteristics of a molecule. The programming algorithm determines the molecular formula, functional groups and the degrees of unsaturation present in the molecule. The software code is capable of detecting the following functional groups: carboxylic acids, ketones, aldehydes, nitriles, esters, alcohols, alkanes, alkynes, and nitriles. This program becomes vital when quickly determining the chemical composition of an unknown molecule or an analyte. Determining the chemical composition of an analyte can be done by hand using the three types of spectra, however, that process is slow and inefficient. The purpose of the program created in this experiment is to efficiently and effectively process the spectra in a matter of seconds to produce the most possible constitutional isomers. Successful software will accelerate the evaluation of spectra and facilitate future research and lab experiments.

- 117.** Variations in Total Phenolic Content and Antioxidant Capacity in 22 Commercially Available Basil (*Ocimum basilicum* L.) Cultivars
Eunice Bajomo '19
Sponsor: Dr. Emily Niemeyer

Ocimum basilicum L., or basil, is an herb originating from the tropical climates of India, Africa, and southern Asia that is well known for its culinary and medicinal uses. Basil leaves contain numerous phenolic compounds which are metabolized in the body after ingestion and reduce free radicals by stabilization of these species. Despite the popularity of basil and its cultivation worldwide, the phenolic composition of 60-100 varieties of basil has not yet been determined. Additionally, the relationship between leaf color, total phenolic content (TPC) and antioxidant capacity has not been established in basil. In this study, 22 basil cultivars were analyzed for total phenolic content and antioxidant capacity. TPC was analyzed using the Folin-Ciocalteu (FC) method, whereas antioxidant capacities were measured using the ferric reducing ability of plasma (FRAP) assay. Total phenolic concentrations of the basil cultivars ranged from 7.07 to 10.81 GAE (gallic acid equivalents in mg/g dry weight, DW) while antioxidant capacity ranged from 51.76 to 117.67 TEAC (trolox equivalent antioxidant capacity in $\mu\text{g/g}$ DW). Results showed that basil cultivars with darker leaves tended to have higher total phenolic content and antioxidant capacity compared to their counterparts with lighter leaves. Based on the high levels of antioxidants found within basil cultivars, especially those with darker leaves, basil may be helpful in prevention of certain diseases associated with oxidative stress.

Education

- 118.** Critical Thinking: A 9-12 Curriculum **C**
Mary Emma Gary '19
Sponsor: Dr. Alicia Moore

In recent years the phrase "teaching to the test" has entered the common lexicon. The phrase refers to the educational practice of curriculum written exclusively to pass standardized tests, a metric which is not comprehensive for measuring learning. This project aims to develop a high school curriculum that meets standardized objectives, particularly the National English and Common Core standards, but focuses on diversifying and exciting class materials. Using Culturally Responsive Teaching (CRT) methods to inform the reading lists and assignments this curriculum will emphasize critical thinking and student interaction. Each grade level (9-12) will have their own theme that the books, short stories, and other textual media revolve around. The themes correspond as follows: Unreliable Narrators, Questioning Classics, Untold America, and Self Criticism. The goal with this project is to have a framework with which I can approach school districts with for implementing curriculum that enhance critical engagement and focus more on CRT than teaching solely to and for a standardized test.

- 119.** Self-Study Teacher Research in Undergraduate Education (**119-138**)
Sister Maria Reginald F. Aanstos '22, Sister Anthony Marie R. Bautista '22, Allison Bienvenu '21, Melina Boutris '21, Allison Bradford '21, Sister Mary Concepta Brockway '22, Zhazze Brown '20, Sister Lucy Fidelis Brungardt '22, Annalee Ewton '21, Taylor Gressett '20, Rehgan Hartsell '21, Brandon Jennings '21, Abigail Luna '20, Sister Monica Marie Lynk '22, Jessica Price '20, Mariana Quetzeri '21, Katie Rydell '21, Sister Teresa Casey Sinishtaj '22, Marisol Solis '22
Sponsor: Dr. Sherry Adrian

Through self-study research, Southwestern Education students focused on improving their practice by taking on the role as teacher-researcher in participatory action research. Self-study allowed each student to enact research inside the context of a local PK-12 classroom. Over the 15-week semester, nineteen Southwestern students engaged in two processes central to self-study. First, each student developed a research focus question related to one of four strands of inquiry: teaching for social justice, culturally responsive pedagogy, teacher identity development or instructional strategies. Data was collected using two approaches: a selected self-study method and qualitative field methods. Second, self-study required the teacher-researchers to work with an inquiry group known as "critical friends" who critiqued the thinking behind the students' research. The 19 self-study research projects allowed each student to reflect on their teaching practices in order to better serve their future PK-12 students.

Environmental Studies

- 139.** Student Workers and their Role in Sustainability at a Small Liberal Arts University: A Case Study of Southwestern University
Kathryn Caudell '19
Sponsor: Dr. Joshua Long

Southwestern University earned a bronze rating for AASHE's Sustainability Tracking, Assessment, and Rating System in May 2018. This program has become an important guideline for developing sustainable initiatives on Southwestern's campus and has largely been led by student workers within the Environmental Studies department. Student initiatives have played an important role in the history of environmental sustainability, such as the student-led initiative that led to a partnership between the City of Georgetown and Southwestern to provide the campus with 100% renewable energy. However, it is important to note the limitations on Southwestern's ability to truly advance its environmental priorities because of the institutional amnesia that accompanies having student workers do the bulk of the work, as well as friction between staff and students. Therefore, this poster details how, at Southwestern, student workers have filled this role and successfully completed the STARS report for multiple years. This poster will discuss the benefits of this approach, the challenges that come with it, and the advances made as a result of the school's involvement in STARS. Finally, this presentation will engage the audience on how this structure can be translated to other small liberal arts colleges like Southwestern University.

Kinesiology

- 140.** Segmental Contributions to Angular Momentum Generated During a Competitive Swimming Start **S**
Dylan Neumann '21 and Alek Argueta '21
Sponsor: Dr. Scott McLean

Competitive swimming starts have evolved over time to be complex movements that maximize speed off of the blocks, resulting in a clean entry to reduce drag as much as possible. **METHODS:** 8 collegiate swimmers were chosen to participate in this study. Each completed four maximal effort dives, two with the wedge and two without. Each trial was recorded and uploaded to Vicon Motus and digitized, where two dimensional kinematic data was used to calculate segmental angular momenta, takeoff velocities and angle, as well as velocities and time at 6, 6.5, and 7m. **RESULTS:** No significant difference was found in any performance measure when comparing starts that used the wedge and those that did not. **DISCUSSION:** Preliminary data suggests that the wedge does not make a significant different in start performance. Thus, competitive swimmers should not worry about the presence of a wedge affecting their start performance.

- 141.** Influence of One Credit Fitness Courses on the Health-Related Fitness and Psychosocial Wellbeing on a Sample of College Students **C**
Katie Harris '19
Sponsor: Dr. Vanessa Mikan


College years are a crucial time in a young adult's life, therefore the development of healthy lifestyle habits is imperative. Increases in academic demands, social influences and level of independence have caused a significant drop in students' level of physical activity (Clemente, Nikolaidis, Mendes, & Huerta-Quintanilla, 2016). Many universities, like Southwestern, encourage opportunities for students to engage in physical activity. Participation in a fourteen (14) week one credit-hour fitness class has shown to provide significant improvements to students' muscular strength, muscular endurance, and cardiovascular endurance (Danoff & Raupers, 2014). Daily physical activity has the potential to not only reduce levels of perceived stress in college students, but reduce symptoms of anxiety/depression and improve overall self-esteem (Hopson, Donatelle, & Littrell, 2015). The purpose of this study is to investigate the health-related fitness and psychosocial wellbeing of college students participating in a one-credit fitness and recreation activity course. Participants were recruited from five fitness and recreation courses at the beginning of the Spring 2019 term. After completing a questionnaire consisting of demographic information, the Godin Leisure-Time Exercise Questionnaire (Godin, 2011), the Rosenberg Self-Esteem Scale (Rosenberg, 1986) and the Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983), participants completed a comprehensive fitness test. 10-weeks post initial assessment participants will again complete both the questionnaire and fitness measurements. SPSS 10.0 will be used to determine differences in the participants' pre and post assessment

measurements. Findings from this study hope to support the importance of one-credit hour activity courses offered on university campuses.

Mathematics and Computer Science

- 142.** Project Pen and Paper: Operations Research for Prospective Students
Katherine Dyo '19
Sponsor: Dr. Barbara Anthony


Alumni have played a vital role in sharing their Southwestern University experience with prospective students and their families through a letter-writing campaign coordinated by the Office of Admission. Each spring, alumni volunteers write to the families of admitted students, with assignments made based on shared academic interests, co-curricular interests, and geographic proximity. The ultimate goal of the letter campaign is to encourage these families to have their student attend Southwestern by exposing them to Southwestern perspectives and experiences. Previously, this required a great amount of manual effort with no clear indication of the optimality of the results. Using operations research techniques, we have developed a software solution to this problem. Our software takes alumnum data and prospective student data and calculates a compatibility metric using reported academic and co-curricular interests and geographic proximity. It also incorporates student attributes such as out-of-state residency, first-generation status, and merit scholarship achievement. Our software generates a list of student-alumni matches based on the compatibility metric and student attributes. Not only does it reduce the amount of work required by the Office of Admission, but it also verifies that the matches are ideal with respect to the Office of Admission's chosen criteria.

- 143.** Verification of Welfare Transactions on the Blockchain 
Alexander Hoffman '20
Sponsor: Dr. Barbara Anthony

Decentralized technologies, such as Bitcoin, are secure, transparent, and nascent technologies for the storage and transfer of information and assets. With their potential for use as a new way to distribute funds such as welfare, they can be used to mitigate inequality by offering governmental assistance to those individuals who qualify. For our Computer Science Capstone Project, we partnered with a Netherlands-based startup company, Forus, to develop upon their welfare-distribution mobile application, the Me app. We are building upon Forus's pre-existing codebase by employing decentralized technologies such as blockchain in conjunction with our own Android mobile application. By increasing the democratization of the Me app, we offer the welfare recipients of the Netherlands a greater sense of security and privacy by replacing centralized, vulnerable databases with personally-stored security. Blockchain technologies verify transactions by consensus, meaning everyone on the application platform has access to every transaction that has been made, where identity is masked by a unique string of characters. Using blockchain technology will provide a reliable way to distribute welfare while reducing fraud in the system.

- 144.** Facilitating Student Internship Experiences through Optimized Fund Allocation Software
Sara Boyd '20
Sponsor: Dr. Barbara Anthony

Thanks to generous donations received from alumni and friends of the University to fund high impact experiences, Southwestern is able to award students funding for unpaid and low paid internship opportunity to ensure that limited funds are not an obstacle in obtaining these experiences. Students apply for and are awarded funds based on the quality of their application and the funding requirements specified by the donors. In the past, a selection committee has matched award to the donations based on criteria set forth by the donor which is a tedious, time-consuming task. As a result, students from the Operations Research class of Fall 2018 worked together to create a software that would automate this process of assignments after the committee uses a rubric to evaluate the student's application. The group of students was able to model these funding assignments in a transportation problem. Once the team formulated the model, they solved test cases using what they learned about linear programming and constraint satisfaction problems to designate funds accordingly. By using this model moving forward, the students are able to maximize the amount of funds given to selected applicants. Now, the committee can use two Google Sheet documents with applicant and fund information, a linear program file generated by our software, and the GNU Linear Programming Solver (GLPSOL) to generate an output file with an optimal allocation of funds to students.

- 145.** Creating A User-Friendly System to Facilitate Tracking and Entry of Internship Hours 
Adina Friedman '19, William Price '19, Elyssa Sliheet '19, Isabel Tweraser '19, and Jacob Yager '20
Sponsor: Dr. Barbara Anthony


As a 2019 Computer Science Capstone project, we created a system that automates data entry for internship timesheets for the Center for Career and Professional Development (CCPD). Before this project, students who participated in academic internships would each have a Google spreadsheet to track the hours they interned each week. This spreadsheet would then be verified by an on-site supervisor and a member of the CCPD staff. This verification required the CCPD staff to view the spreadsheet and then manually enter the individual student hours per week into a master spreadsheet. This process was time-consuming and prone to human error. Our system automates this process to make it a simple and easy procedure. We are utilizing software engineering techniques we have learned throughout our time at Southwestern, as well as the Google API and Python scripts. Our program ultimately cuts down the amount of time that the CCPD staff has to spend on menial tasks, allowing students, supervisors, and CCPD to have an easier time sending and validating internship information.

- 146.** Voluntunity: Building a Volunteer Opportunity Website with Django 
Taylor Axtell '19, Sara Boyd '20, Lauren Gillespie '19, Danielle Orbach '19, and Colin Scruggs '19
Sponsor: Dr. Barbara Anthony

The Office of Community-Engaged Learning (OCEL) at Southwestern University curates a list of nonprofit agencies in Williamson County that offer potential volunteer opportunities to students of Southwestern and the greater Georgetown community. Recently, this list is maintained as a single PDF file and an internal-only Excel spreadsheet, which is difficult for users to navigate and burdensome for OCEL staff to update. In order to streamline the user experience and simplify list maintenance for OCEL staff, our Computer Science Capstone in Software Engineering group created an online web application and database for these opportunities. Our site is built on top of a MySQL database using the Django framework to interface efficiently with the database. This site displays opportunities to users interactively, in both tabular and map form. Users can also search for potential opportunity matches and filter opportunities based on a wide range of characteristics, including opportunity type and location. Furthermore, our web application allows OCEL staff to easily add, modify, and delete opportunity entries through a database maintenance user interface built-in to the Django API. This website will improve the user experience for students and community members interested in connecting with relevant volunteer opportunities and also decrease workload on OCEL staff members who maintain the list.

- 147.** 2018 VAST Challenge: Blending Machine Learning and Interaction Design with Audio Explorer
Cameron Henkel '21
Sponsor: Dr. Jacob Schrum

The Visual Analytics Science and Technology Challenge is an annual data analysis competition aimed at students and researchers to facilitate the development of novel tools for visual analytics. Our work concerned one part of the 2018 challenge that revolved around historical data of bird calls in a fictional wildlife preserve and a collection of fifteen audio samples purported to be of a certain species provided by a corporation. Our goals were to describe the historical patterns of the various bird species and confirm or refute the validity of the samples. The provided dataset included over 2000 labeled recordings of birds found in the Preserve along with metadata covering species, recording quality, vocalization type, location, and time. We built a comprehensive data visualization tool that could be used to corroborate the corporation's claims. First we trained machine learning models that could reliably classify their labeled audio recordings. Second, we designed and built a single-page web application (Audio Explorer) to both display these predictions and to provide means for a user to interact with the accompanying datasets. Audio Explorer's heatmap shows geospatial and temporal data within one view. Recognizing that there could be unknown species in the dataset as well as inconclusive classification results, Audio Explorer further allows an analyst to confirm model predictions using audio playback and visual inspection of waveforms and spectrograms. Our submission was recognized as the overall winner of the 2018 VAST Challenge after being presented at the IEEE VIS Conference in Berlin, Germany.

- 148.** Designing Improved Platforms for SU Radio 
Cameron Henkel '21 and Colin Scruggs '19
Sponsor: Dr. Barbara Anthony

SU Radio is experiencing resurgence on campus led by an influx of new content producers and increased interest in broadcasting. One small problem remains: people aren't tuning in enough! Currently the only way to actually listen in is by going to a clunky website maintained by SU Radio's third-party streaming partner. To help mitigate this issue, our team, which includes the president of SU Radio, is developing and rolling out a mobile app and website for streaming the live shows produced by the organization's new DJs and talk show hosts. This app allows students to listen in wherever they are, in a format that is familiar to them. One of the most unique aspects of the app is the ability to tune in to live shows, a feature not offered on the popular streaming apps and websites already used by students which focus primarily on music and pre-recorded podcasts. We anticipate that the mobile app and streamlined website will contribute to growing SU Radio's base of listeners and improving the outreach of student content creators.

- 149.** Rideshare Data Visualizer
Cameron Henkel '21
Sponsor: Dr. Barbara Anthony

The City of Georgetown partnered with the rideshare company Lyft to provide subsidized rides originating in Georgetown for several months during 2018. Preliminary data about these rides was shared with students in the 2018 SU Operations Research course tasked with analyzing the Georgetown bus system (GoGEO) and associated partnerships. Creating a data visualization tool based on GoGEO information provided valuable insight into bus route analysis, motivating this work on developing a similar visualization tool for understanding rideshare data in a local context. Leveraging the Google Maps API in conjunction with public census tract data encoded as GeoJSON files, the tool provides analysts with quick insights into rideshare use in a given area. The tool is data-agnostic allowing public entities to use it with their own data, assuming standardization. During development, we are using test data for validation; later, the City of Georgetown will be able to use the real-world data they are provided by Lyft or other companies to validate the effectiveness of the visualizations. While it can be fully locally hosted, allowing entities to maintain control over who has access to the data, online hosting is likewise supported by the web-based backend. Accordingly, this tool provides a means for government officials and residents of Georgetown and other cities to more easily visualize local ridesharing.

- 150.** Predictors of Preference for Types of Mental Health Treatment for Ukrainian Adults
Daniela Beckelhymer '20
Sponsor: Dr. Barbara Anthony

This study investigated lifetime DSM-IV mental health disorder diagnoses, urbanicity, financial status, levels of social support, strength of religious beliefs, self-reported health, and physical health issues as predictors for choosing to seek any type of mental health treatment. Following this analysis, the study further explored predictors of choosing alternative (e.g. witches, traditional healers) or conventional types (e.g. psychiatrists and medical doctors) of mental health treatment. The World Mental Health Composite International Diagnostic Interview (WMH-CIDI) was administered to a nationally represented sample of Ukrainian adults ($n = 4725$). Associations between various predictors were examined among the treatment-seeking population ($n=260$). Results showed that overall, both women and men are more likely to seek any kind of treatment if they have poor self-rated health, have physical health issues, and are diagnosed with mental health illnesses, particularly depressive disorders, anxiety disorders, and alcohol abuse. When examining behaviors of those who sought alternative services, religiosity is the single most significant factor. The results reinforce the need to bridge conventional and alternative services to provide well-rounded treatments for the wider population.

- 151.** Changing Environments Drive the Separation of Genes and Increased Evolvability in NK-Inspired Landscapes
Lauren Gillespie '19, Emily Dolson (MSU), Alexander Lalejini (MSU), and Charles Ofria (MSU)
Sponsor: Dr. Jacob Schrum

Why are genes separated in complex biological organisms but overlap in simple ones? Functional modularity arising from disjoint genes leads to long-term evolvability improvements. However, evolution promotes immediate fitness

gains rather than long-term growth, so modular genetic architectures must also result in immediate fitness gains to survive. Furthermore, modular genetic architectures with separated genes require more genetic material, which makes them a larger mutational target. This leads to the question: what environmental pressures promote the evolution of modular genetic architectures? Changing environments shift selection to favor modular genetic architectures by ensuring that adaptive peaks are transitory and populations are always undergoing active selection. We investigate this issue using an NK-inspired model, which utilizes a fitness landscape whose ruggedness and corresponding gene epistasis is easily adjustable in terms of two parameters: N and K . Our modified NK model allows for variable genome length and evolvable gene locations, which relate genetic modularity to the extent that genes overlap with each other. Indeed, we find that higher mutation rates lead to smaller genomes with more overlap while changing environments select for larger genomes with less overlap and more functional modularity. Genes that are spread out within a genome experience more rapid adaptation to new environments, which helps explain genetic organization in nature, and provides insights on producing more modular and evolvable artificial organisms in engineered systems.

- 152.** Evolving Custom Convolutional Neural Network Architectures in SZ-Tetris
Devon Fulcher '19
Sponsor: Dr. Jacob Schrum

Video games provide for a challenging testbed for novel artificial intelligence algorithms. In particular, a variation of Tetris where only limited types of pieces are allowed, called SZ-Tetris, poses an interesting environment to observe the performance of evolved neural networks. Neural networks are representations of artificial brains that simulate the information processing capabilities of natural brains. We evolved neural networks with the HyperNEAT algorithm. Evolutionary algorithms, like HyperNEAT, iteratively evaluate a set of solutions to a problem then apply the evolutionary operations of mutation, natural selection, and sexual reproduction on these solutions to form a better set of solutions. HyperNEAT is distinct in that it can compactly encode very large networks, similar to how a DNA strand can generate an entire organism. Recently, neural networks with a large number of layered neurons, called deep neural networks, have shown promise in artificial intelligence problems. We extended HyperNEAT in order to create deep neural network architectures and tested these architectures in SZ-Tetris. Specific configurations of these deep architectures improved upon scores of simpler architectures in SZ-Tetris.

- 153.** The Kissing Disease and Differential Equations **C**
Stan Kannegieter '19
Sponsor: Dr. Therese Shelton

Mononucleosis (mono) is a common disease in developed countries and can evolve due to several viruses. Epstein-Barr virus (EBV) is one of the most common causes of mononucleosis. Between 45% and 65% of college students will get mono when infected with the EBV. This paper provides a numerical overview and sensitivity analysis evaluating real life scenarios of mononucleosis outbreaks on a U.S. campus. The purpose of this paper is to develop a model of SIR (Susceptible, Infected and Recovered) and SIIRR to examine EBV and mononucleosis. We examined the effect of an improved immune system and a decrease in the susceptible-infected contact rate on a fixed population of 15,000 students. We found that waning immunity and susceptible-infected contact rate have a strong effect on infections of mononucleosis, since a lower value in both models corresponds to fewer people getting infected. Ultimately, we found that the SIR and SIIRR models effectively function as a simulation to evaluate the epidemic outbreak of mononucleosis on a fixed student population.

Physics

- 154.** Wave Powered Boat **S**
Audrey Colegrove '21 and Jacob Jimerson '20
Sponsor: Dr. Steven Alexander

During the summer of 2017, SCOPE students set out to see if they could recreate the Suntory Mermaid II, a 9.5 meter catamaran that was propelled by the ocean's waves. The boat used a Wave Devouring Propulsion System (WDPS) that relied on springs and movement under water. While the students managed to build a working prototype, our job was to make the boat more efficient and to look further into the physics behind this mechanism.

155. Micro Particle Image Velocimetry Flow Measurements in a Stenotic Region

Alexis Dimanche '20

Sponsor: Dr. Steven Alexander

Heart diseases affect more than 5.7 million Americans¹, a rising number due to prevalent risk factors. A subset of CVD is coronary artery disease (CAD) that could result in angina and heart attacks. At a site of atherosclerotic plaque rupture, platelets activate and form a thrombus (e.g. blood clots). However, low velocity blood flow can lead to an increase in the platelet residency time favoring platelet adhesion and aggregation, which can also increase the chances of thrombosis. In this study we examine flow using a micro-particle image velocimetry (PIV) system. We are interested in the fluid dynamics around a region of stenosis and the anticipated effects on platelet activation. Microchannels were made using photolithography and polydimethylsiloxane (PDMS). The PDMS devices were placed on glass plates using an oxygen plasma treating technique. A solution composed of 1% tracer particles was injected at a 20 $\mu\text{L}/\text{min}$ and 50 $\mu\text{L}/\text{min}$ flow rate in the devices. A micro-PIV system connected to TSI Inc. INSIGHT 4G™ software was used to quantify the flow in microchannels with stenoses of 50% and 66%. The velocity field shows very low velocities of the order of 0.1 μs downstream of a 50% stenosis. The fluid accelerates through the stenosis and diffuses as the channel opens. Low velocities appear at the walls up and downstream of the 50% stenosis. Past literature associated low velocity blood flow with clotting due to an increase in the platelet residency time favoring cell-cell interactions needed for platelet adhesion.

156. Underwater Game Camera

Luke Hicks '20 and Ty Stubbs '19

Sponsor: Dr. Steven Alexander

The purpose of this project was to be able to track and observe underwater game in their natural habitat over multiple days. After conducting preliminary research, we found there was no trail cameras designed to stay underwater for long periods of time. We found the only cameras on the market were large portable video cameras expert divers use while submerged. They were very expensive and would not allow for lengthy tracking. They also required the presence of divers which may affect the natural existence and behavior of such wildlife. Our primary goal for the summer was to design, build, and test this new type of waterproof trail camera. Our secondary goal was to improve the cost effectiveness of collecting data using cameras over an extended period of time on underwater game in their natural surroundings with as little disruption to them and their habitat as possible. Our procedure included building the camera using clear acrylic tubing, rope, anchors, aluminum plates, buoys, Raspberry Pi 3 B+ programming, and an Adafruit V2 camera module. After several tests, we found we were able to take up to 6120 pictures over a seventeen-hour period. We felt this level of tracking was sufficient and determined our project to be successful. Funding Acknowledgment: Funding for this project came from Southwestern University's SCOPE program and its donors. Collaborations: This project was collaboration between Southwestern University's SCOPE Program, Dr. Steven Alexander and Physics students Ty Stubbs and Luke Hicks Jr.

157. Coming for you Voyager 1: Using a Solar Sail to Explore Space

Nathan Fetchel '22

Sponsor: Dr. Rebecca Edwards

Putting a man on the moon was a major milestone in space exploration. Since then however, space has remained to be timidly unexplored. To conquer this task, I have proposed a solar sail that will act as a sailboat does. Similarly, as a sailboat uses wind to travel through the ocean, the solar sail will use the pressure from a photon of light to propel it through space. Photons from the sun would reflect off the sail as light reflects off a mirror. The sail would use reflective material to reflect photons and use their pressure to accelerate it through space. Although starting off at a minuscule velocity, the sail would accelerate constantly and exponentially as the photons would exert constant pressure on the sail. One thing to consider, if we are trying to send this solar sail deep into space, is that the sun can only provide energy for so long until we are beyond its reach. But if we know the location of the sail, we could shoot lasers or use light from other stars to propel the sail to further explore space. The solar sail would be able to explore deeper into space than we have ever been, capturing pictures and data never seen before. Through further development and testing, this could help us answer some of the most intriguing questions about space. What is out there? What does a black hole look like? Are we the only intelligent species out there?

Psychology

- 158.** When You See the Real Me: The Moderating Effect of Disclosure on the (Mis)Understanding/Health Link
Olivia Montreuil '20
Sponsor: Dr. Erin Crockett

Based on literature which suggests high self-disclosure fosters understanding (Reis & Shaver, 1988), we examined how differences in self-disclosure moderated the health effects of either being understood or misunderstood. 106 participants (66 women, 40 men) recalled and wrote about a recurring interpersonal conflict. Participants were then interviewed by a stranger who used both verbal and non-verbal cues to communicate either understanding or misunderstanding the participant's conflict. During the procedure, we collected four saliva samples for the later determination of cortisol, a stress hormone. We analyzed participants' transcribed interviews using the LIWC program (Pennebaker, 2011). Specifically, we used the authentic, insightful, and affective dictionaries of LIWC as indicators of participants' depth of self-disclosure. As expected, when participants disclosed more about themselves during the interview, being misunderstood was associated with slower cortisol recovery after the interview. Self-disclosure did not, however, moderate the health effects of understanding. The present study suggests that vulnerability offers health risks during unfavorable interactions. We examined how differences in self-disclosure moderated the health effects of either being understood or misunderstood. Participants were interviewed by a stranger who communicated either understanding or misunderstanding the participant. When participants disclosed more about themselves during the interview, being misunderstood was associated with slower cortisol recovery after the interview.

- 159.** The Effects of Parent and Teacher Involvement on Students' Academic Achievement
Ana Olvera '21
Sponsor: Dr. Erin Crockett

The purpose of this study was to determine how teacher involvement and parent involvement affect a child's academic achievement. Interestingly, both types of involvement fluctuate as a child ages from kindergarten to eighth grade. As such, I was particularly interested in how both types of involvement interact in predicting a child's academic achievement if both, only one, or none of the types of involvement were reported over the years. The study involved a public data set with approximately 22,000 children (8410 female, 8791 male) who were predominantly White. Data was collected from two-stage academic assessments along with input from the children's parents, teachers, and school administrators. The children participated in a longitudinal study in which they were measured for a multitude of variables involving development, early learning, and early performance in school through parent interviews, teacher questionnaires, and assessments for the students. I hypothesized that both parent and teacher involvement will have a positive effect on a child's academic achievement such that if there is more teacher and parent involvement reported, children will have higher scores across assessments. I also hypothesized that if both types of involvement are reported, child will have even higher scores across assessments than if only one type is reported. Lastly, I hypothesized that language will potentially moderate the relationship of involvement and academic achievement. Results will have implications for future education strategies of increasing academic accomplishment for children.


- 160.** Trends of Technology Relationships Over Time and Future Predictions
Tyler Norman '20
Sponsor: Dr. Erin Crockett

Prior research on human interactions with technology has found that beliefs about and acceptance of technology is predicated by people's attitudes, anxiety, self-efficacy, usage, education, and age. The goal of this study was to examine how people's relationships with technology have changed over time, and what these trends could tell us about upcoming generations of technology users. To test this, I utilized a pre-existing dataset from the National Science Foundation (NSF) of public attitudes towards and interest in science and technology. This dataset includes data from a cross-sectional study of US adults (18+) from 1979-2006. Specifically, it measures literacy and comprehension of scientific concepts, acquisition of scientific information, computer access and usage, and opinions on how science and technology affect everyday living. I hypothesized that (1) in general, there will be a positive trend in people's relationship with technology over time, (2) education will be positively correlated with attitudes/self-efficacy, and (3) the youngest age groups will exhibit more positive relationships with technology.

Findings have broader implications for upcoming generations, who likely have a more solid technological foundation and consequently a better relationship with technology.

- 161.** Two Ends of the Same Rope Pulled - The Stress of Acculturation in College Life
Camila Ramirez '21
Sponsor: Dr. Erin Crockett

The present study investigated acculturation in college students and whether or not Latino/students are generally more stressed than non-Latino/a students. Acculturation is the act of adapting to a new culture while either abandoning or balancing one's original culture/heritage. Typically, acculturation is pressured onto an individual by society. I studied this topic in a sample taken from Project Stride (Stress, Identity and Mental Health), a research project that sought to find the relationship between minority identities and stress in New York City from 2004-2005. The sample included 131 Latinos/as out of 524 participants' total, ages ranging from 18 - 55. In the survey, past research found that a majority of Latinos/as do not feel close to their communities (both White and Latin American) and did not engage in activities within these communities, highlighting feelings of stress among Latinos/as. Indeed, Latinos/as are one of the most stressed minority groups in the United States of America. In the present study, we took a closer look at sources of this stress, including, biculturalization (the balancing of two separate cultures with pressures from both sides) and family stress as children who are acculturating faster than their parents may have cultural tension within the family. Taken together, present and past research in this area suggests that acculturation creates stress for the Latino/a community.

- 162.** Effects of Gender and Expectations on Stress 
Kayla Tate '19
Sponsor: Dr. Erin Crockett

Feeling understood by others, as opposed to actually being understood, is an important predictor of well-being (Reis et al., 2017). As such, gendered expectations that women will be more understanding than men likely have consequences because violating these expectations may prevent an individual from receiving the health benefits associated with understanding. To test this hypothesis, we examined the effects of interviewer gender (male or female) and type of feedback (understanding or misunderstanding) on physiological measures of stress (i.e., cortisol). We asked 106 participants (66 women, 40 men) to write about a recent social stressor they experienced with someone close to them. Participants then discussed this stressor with either a male or a female interviewer who provided understanding or misunderstanding feedback. A 2x2 Mixed Model ANOVA revealed an interaction between the interviewer's gender and the type of feedback given. Specifically, understanding was more beneficial for health when it came from a woman as opposed to a man. Results demonstrated that gendered expectations alter the physiological benefits an individual receives from understanding interactions.

- 163.** The Effect of Child Awareness in the Intergenerational Transmission of Alcohol Abuse
Aaron Mink '21
Sponsor: Dr. Erin Crockett


In 2015, 26.9% of people aged 18 or older reported that they engaged in binge drinking in the past month; 7.0% reported that they engaged in heavy alcohol use in the past month (National Survey on Drug Use and Health, 2015). The purpose of this study was to gain a deeper understanding of the role intergenerational transmission plays in the prevalence of alcohol abuse. Consistent with aversion theory, it is possible that children with alcoholic parents might be less likely to abuse alcohol later in life, especially if they witness or are aware of the harmful effects caused by alcohol abuse. We hypothesized that children's awareness of parental alcohol abuse would diminish the likelihood of the intergenerational transmission of alcohol abuse. In order to investigate this, we analyzed data from the Midlife Development in the U.S. (MIDUS) national survey. The MIDUS survey investigates age-related health changes through a biopsychosocial frame. Specifically, participants reported occurrence of parental drinking problems as well as long-term and short-term consequences of parent's alcohol abuse. Results from the current study expand the breadth of knowledge on the intergenerational transmission of alcohol abuse and inform parents and professionals about the importance of addressing alcohol abuse in children's family of origin.

- 164.** Religion and It's Association with Mental Health in Old Age
Emily Dunn '21
Sponsor: Dr. Erin Crockett

The purpose of this study was to understand how religiosity was associated with individual's outlook on death and feelings about aging. To address this goal we used data from the Longitudinal Study of Generations (LSOG), which collected data from over 300 three generation California families. The family members surveyed were grandparents (in their 60s), parents (in their early 40s) and children (ages 15 to 26). In this data, I examined how religious participants view themselves, their personal view of aging, and the extent to which they feel anxious. This examination is based on research which finds that people who recover from illnesses tend to become more religious, and that religion tends to help people cope with traumatic events. I hypothesized that the religiosity would be positively associated with a hopeful outlook on aging, and negatively associated with anxiety. Our results imply that having religion in old age reduces anxiety brought on by death and illness, and also makes it easier to embrace death and illness, due to the idea that there is 'a reason for everything'.

- 165.** Practice Makes Perfect: Repeated Sexual Experience Enhances Sexual Motivation as Female Rats Approach Middle-Age
Chantal Gonzalez '19 and Devon Lucero '19
Sponsor: Dr. Fay Guarraci

Reproductive senescence is an inevitable aspect of female aging. Nevertheless, our understanding of how sexual behavior changes across the lifespan are limited. The current study investigated the effects of repeated sexual experience as female rats approach middle age (12 mos. old). Female rats (aged experienced; n=11) were tested for partner preference (2x/month from young adulthood to middle age). In the partner preference test, each subject is given the choice to interact with a same-sex conspecific or a sexually vigorous male, which allows for the opportunity to mate. With repeated tests, female rats increased time spent with the male, displayed more solicitation behaviors, and were less likely to leave the male after mounts. However, female rats became less active over time, visiting the stimulus animals less frequently. A separate group of age-matched, hormone-yoked female rats (aged virgins; n=12) were left to age alongside the sexually-experienced group and then mated for the first time at 12 mos. old, when the experienced group received their final mating test. Aged virgins spent significantly less time with the male and displayed fewer solicitation behaviors than their experienced counterparts. We also compared mating behavior on the first test of young adult rats (young virgins, 2 mos. old) to the first test of the middle-aged rats (aged virgins, 12 mos. old). Aged virgins took longer to return to the males after mounts and displayed fewer solicitation behaviors than young virgins during their first sexual encounter. Finally, aged virgins were less active, visiting the stimulus animals less frequently than the young virgins. Taken together, these results suggest that repeated sexual encounters increases sexual motivation even as females' transition into middle age, and that delaying the first mating encounter until middle age leads to reduced sexual motivation, relative to the first mating encounter as a young adult. We also found a number of specific effects of aging on partner preference. In summary, these findings add to our understanding of changed in reproductive behavior across the lifespan.

- 166.** The Reproductive Effects of Neonatal Exposure to Genistein in Male and Female Long-Evans Rats 
Maryam Ali '20, Michael Broyles '19, Chantal Gonzalez '19, and Devon Lucero '19
Sponsor: Dr. Fay Guarraci

The present study was designed to examine the effects of neonatal genistein exposure on measures of reproductive physiology and behavior. Approximately 24 hours after birth, male and female Long Evans rat pups were injected daily with genistein (0.15mg/kg, s.c.; n=23) or oil (0.15 mg/kg, s.c., n = 22) for 5 days beginning on postnatal day (PD) 1. After weaning at PD 23, preputial separation in males and vaginal opening in females were examined daily until all subjects reached puberty. For all female subjects, we examined vaginal cytology daily for 28 days starting ~ PD 55. Two months after monitoring estrous cyclicity, the female subjects were given the opportunity to interact with a male or a receptive female on the day of behavioral estrus to assess sexual motivation (i.e., partner-preference test with and without physical contact). For all male subjects, we assessed the development of male copulatory behavior once weekly for 3 weeks beginning ~ PD 55. On week 4, sexual motivation was assessed using the partner-preference test (without physical contact). We found that neonatal exposure to genistein had no effect on puberty onset in male or female rats. However, genistein disrupted estrous cyclicity in adult female subjects, as indicated by greater number of irregular cycles. Neonatal genistein exposure also altered the development of male

copulatory behavior. In contrast, neither female nor male sexual motivation was affected by genistein. The results of the present study have important implications for the development of reproductive physiology and behavior in human neonates exposed to genistein in soy-based baby-formula.

- 167.** Positive Correlations Found for the Impulsive Self-Defeating Lifestyle Factor of Psychopathic Traits and Maladaptive Daydreaming in College and Offender Samples
Meredith Pollock '19
Sponsor: Dr. Bryan Neighbors

Studies of offenders and non-offenders have found that psychopathic traits are positively associated with deviant sexual fantasizing, however studies have not explored problematic fantasizing in general. Maladaptive daydreaming (MD) involves recurrent and extensive daydreaming that replaces human interaction or interferes with functioning. The current study tested the hypothesis that psychopathic traits would positively correlate with the frequency of MD in both offender and non-offender samples (N = 208). The Levenson Self-Report Psychopathy Scale (LSRP) measured two factors of psychopathic traits: a selfish, uncaring, and manipulative interpersonal style (primary), and an impulsive, self-defeating lifestyle (secondary). The Maladaptive Daydreaming Scale (MDS) measured multiple dimensions of daydreaming: content, compulsion/control, distress, perceived benefits, and life interference. The only significant demographic correlate of MDS scores was age in the offender sample. A single linear regression equation was calculated for each sample with the total MDS score regressed on the two psychopathic trait dimensions. In the student sample, higher secondary psychopathy scores predicted greater MD ($R^2 = .04$, $F(2,128) = 2.92$, $p = .01$). Secondary psychopathic traits were also positively correlated with MD in the offender sample ($\Delta R^2 = .15$, $F(3,73) = 7.26$, $p = .008$). This research extends MD work into the realm of personality pathology, suggesting the possibility that the undercontrolled mental activity assessed via the MDS could be a further manifestation of the impulsive and poorly controlled personality, signaled by the presence of secondary psychopathic traits. The notably stronger relationship among the offender sample may warrant further testing in criminally relevant samples.

- 168.** The Correlates of Risk-taking: ADHD Symptoms, Personality and Relationships **C**
Naomi Brown '20, Catherine Justus '20, Gissell Perez '20, Ruth Riley '20, and Miranda Yannon '20
Sponsor: Dr. Bryan Neighbors


Research on risk-taking has demonstrated its relationship to a wide variety of negative life outcomes for college students. This research has identified a number of key correlates of risk-taking including psychopathic traits, attention deficit hyperactivity disorder (ADHD), and interpersonal attachment style, however studies have not tested the pattern of intercorrelation among these four variables. Furthermore, there is a gap in the literature that looks at the propensity to engage in risky behavior in different domains, such as financial risk, ethical risk, and social risk. Psychopathic traits and ADHD symptoms have been found to correlate positively with the propensity of risk-taking, as has anxious and avoidant attachment security. The current study proposes that the correlations between the propensity of risk-taking and attachment security, as well as the propensity of risk-taking and frequency of ADHD symptoms, will be mediated by psychopathic traits. Data for the study has been collected from 243 college students, and the results of statistical analysis of the proposed mediation model will be presented and discussed.

- 169.** Friend or Foe: How Familiarity of the Competition Affects Female Intrasexual Competition **C**
Ella Doss '19 and Emily Olson '20
Sponsor: Dr. Carin Perilloux

Evolutionary psychologists have studied female intrasexual competition, but there has been little research investigating specific contextual factors that affect women's degree of intrasexual competitiveness. In the current study, female MTurk users (N = 203) between the ages of 18 and 25 read a vignette describing an upcoming party and chose an outfit they would potentially wear to it. Within the vignette, we manipulated the presence of a male crush, the familiarity of a female party companion (close friend or acquaintance), and the relative attractiveness of the companion and measured the sexiness and revealingness of clothing choices. We calculated overall revealingness and sexiness scores for each outfit by averaging ratings obtained from a separate sample (N = 100). As predicted, women told to imagine attending the party with a close friend chose the same degree of revealing clothing, regardless if their crush would be present at the party or not. However, women asked to imagine attending the party with an acquaintance chose significantly more revealing clothing if a crush was present than absent. These

findings indicate that women's intrasexual competition mechanisms are complex and appear to take into account both familiarity of rivals and presence of potential mates.

Sociology and Anthropology

170. The Great Barrier Reef and Australian identity: Sense of place influencing perceptions 

Miranda Wolk '19

Sponsor: Dr. Melissa Johnson


The experiences that people have regarding a place both create a sense of place, and directly shape peoples' perception of that place. I explore these relationships in the context of Australia's Great Barrier Reef, a national landmark for the country, a revenue source for tourism and a World Heritage Site. The sense of place people who live near the Great Barrier Reef develop and the attitude they have toward the Reef vary depending on the kinds of experiences they have with the Reef. As part of a School for International Training Study Abroad program in Australia between August and December of 2017, I conducted ethnographic research for a four week period in Townsville, Queensland, engaging in participant observation and administering 14 in-person interviews with participants who work with the reef in different ways. In this paper I argue that a person's sense of place affects the way that they perceive the inherent values of the reef and what dangers that they perceive as being the gravest threats to the reef's longevity.

171. Assembling Blackness and Whiteness in Morocco

Dakota Cortez '19

Sponsor: Dr. Melissa Johnson

Building on the work of global critical race theorists such as Jemima Pierre (2013) and Deborah Thomas (2013), my paper considers the constructs and assemblages of Blackness and whiteness in Morocco. Morocco occupies an interesting space geographically and in the global racial imaginary. It is in close proximity to Europe, while also being situated in Africa. Yet it is located within the Maghreb, the North African region often considered to be separate from the rest of "Africa." This distinction is racialized in itself, a distinction I argue Moroccans are becoming confronted with more often as Morocco is increasingly utilized as a transit and destination country for immigrants from countries that are primarily south of the Sahara desert. Using my own experiences, observations, as well as informal and formal conversations and interviews, while living in Rabat, Morocco and conducting ethnographic research there in Fall 2017 and again in Winter 2018, I consider how global white supremacy and global anti-blackness play out in complex ways. I explore assemblages of blackness and whiteness, considering the ways embodiment, skin color, perceived foreignness, language, and religion come together here, and how different constituents in Morocco understand and talk about these assemblages.

172. A Difficult South Texas Decision: To Stay or To Leave for University 

Kassandra Saenz '19

Sponsor: Dr. Melissa Johnson

In this paper, I investigate how graduates from the Rio Grande Valley decide to either leave or stay in the Rio Grande Valley for college. I interviewed 12 people over the span of a month. These interviewees were from different high school graduating classes, attended different high schools, and attended different universities in and outside of the Rio Grande Valley. My own experiences of being born and raised in the Rio Grande Valley, and the process of making the decision to leave for college has allowed me to understand the way that culture can have a great impact in individuals life decisions. Through these ethnographic interviews, I found that the three main reasons that influenced this decision were familial support, distance from the Rio Grande Valley, and financial aid. My findings thus support work showing that familism is an organizing principle for Latinx communities in the US (Campos et al. 2014; Hernandez and Bamaca-Colbert 2016; Parke and Buriel 2016). Familism describes the prioritizing of that prioritizes familial support, relationships, and opinions more than those of the individual.

173. Why Do You Not Have Any Hair? **C**

Nour Hussein '19

Sponsor: Dr. Melissa Johnson

It is difficult to understand anything or anyone with just one glance. However, that doesn't stop many people from making about why I look the way I do. In my paper, I use autoethnographic techniques to analyze my own personal experiences as a young Palestinian-American woman with the total hair-loss condition alopecia universalis to show how other people's reactions to me reveal the cultural and social structures around me. Through the different places and groups of people I come into contact with, I examine the multifaceted ways in which narratives of embodiment work and speak to varying discourses of race and ethnicity, gender and sexuality as well as class, religion, and health. It puts into question and consideration what a healthy and normative body looks like and at what age. I consider my experiences in my small conservative hometown, to my four years at a private liberal arts college, and in the multicultural landscape of Morocco during my study abroad and summer trip. Wherever I am, people seek to understand my baldness, and how they explain it, either through questions they pose to me, or reactions when I explain my appearance, are structured by prevailing expectations of how young women should be embodied. I discover that who I am to others, is merely a reflection of how they see me best fit into their understanding of the world and oftentimes, I notice that my own story is overshadowed by the stories they tell themselves about me.

174. Amigos Que Vienen: Tourism and Living the Good Life in Chinchero, Peru **C**

Iván García '19

Sponsor: Dr. Melissa Johnson

Over the last several decades, tourism has grown from a simple leisure activity to being a method of development for countless countries around the world. Peru has utilized its natural beauty and incredible culture to its advantage in order to benefit from the increase of foreign money entering the country. Ranging from the country's economy to the pockets of countless individuals there has been an increase in the quality of life for the citizens in Peru. For the individuals who have chosen to participate in the tourism industry, they have increased their quality of life for themselves and their families. Unfortunately, most individuals who work in the tourism industry work in positions that commodify and exploit elements of culture they are active in. From this arises a peculiar situation in which the negatives and benefits of the tourism meet face to face. While the country offers various natural and cultural values the District of Chinchero has become famous for its textile and sees a large amount of tourists as it's situated on the way to many other sites in the Sacred Valley. These textiles are not simply pieces of textiles sewn together, but pieces of art that are representative of Andean culture and Cosmovision. The increase of tourism in the area has seen a revitalization of textile production (or like I'm trying to say there is an increase of people teaching children and grandchildren how to knit) and a better quality of life. By linking theoretical, academic and ethnographic research this study focuses on trying to better understand the negatives and benefits of tourism and if there is balance that can exist.

175. "Pacific" Island Girl: Context in Which Blackness Operates in Samoa **C**

Vasthy Maurival '19

Sponsor: Dr. Melissa Johnson

Claiming blackness in the US can be a daunting task; centuries of racism have created cultural norms and institutional structures that encourage anti-blackness. However, growing up as a Haitian American black woman in the US, I was taught to have pride in my blackness. For me, blackness and black people are something to revel in and celebrate even in the face of bigotry and oppression. Through centuries of colonization by white superpowers, anti-black rhetoric and practices are present throughout many regions across the world. This type of discourse has been studied extensively in many places, such as the United States, Europe and the Caribbean, but scholarship is limited on blackness in the Pacific. I investigated blackness in Western Samoa, through an auto-ethnographic lens, while on a study abroad program with the School of International Learning from January to May of 2018. I complemented auto ethnography with interviews and participant observation. Because Samoans are racialized and treated as black when they migrate to the US, I was interested in how they experienced their own blackness in Samoa. However, over the course of my research, it became evident that Samoans rejected being categorized as black, and instead embraced anti-black discourse. Through interviews with ethnic Samoans and others, my own experiences as a black woman being racialized by Samoans, and conventional participant observation, I argue that Samoans engage in anti-blackness while still being stigmatized as black within the global racial order.

Classics


176. Latin Graffiti Translated to a Modern Setting
Paola Bazan '22, Calie Bell '22, Jake Casazza '22, Chloe Drum '21, Isham Kimbell '21, Camille Krumwiede '22, Samuel Laude '22, Samuel Moran '22, Amy Reynolds '22, and Darby Stowers '22,
Sponsor: Dr. Halford Haskell

We were interested in learning more about the cultural differences in the language we are learning and modern society. We often look at and translate Latin graffiti in class and for homework. We thought it would be interesting to take a modern and artistic look at the classic graffiti as a way of examining how culture has changed. In this day and age graffiti is an art form which allows unique artistic expression because it can be done by anyone. On the other hand in the past much of graffiti was the stuff scrawled on bathroom walls and had little to no artistic value. We are also interested in engaging an audience that might not normally interact with the classics. By making Latin relatable to a modern era, we are hoping to teach them about the classics in a way they can relate and understand.

Theatre

177. Heather's The Musical Lighting Design
Trevor Stoneburner '20
Sponsor: Prof. John Ore

Heathers The Musical is a rock musical set in the 1980's which recently premiered on the West End and produced by Southwestern in March 2019. The lighting for this show utilized new technology for Southwestern with pre-visualization software, Capture 2018, to view the lighting design before the theater was available for use. This process of design, increasingly common for professionals, is new to Southwestern University. This now allows Sarofim students to become skilled in professional software to better prepare for the ever-changing entertainment industry in the 21st century. This project has shown how the lighting workflow can be adjusted to design weeks before a production and prepare a show without a physical space. The outcome shows both benefits and creates additional challenges for the design process. Knowing the pros and cons of this system, it is now known how the software can best be utilized for a production in live entertainment.

178. Immersive Theatre For Social Change in Lucy Prebble's Play *The Effect*  (178-179)
Samantha Bruno '19, Tristin Evans '19, Bonnie Lambert '19, Matthew Murphy '19, Joan Milburn '19, Emily Scott '19, Rebekkah Sheridan '19, and Chris Szeto-Joe '19
Sponsor: Dr. Kerry Bechtel 1:45 pm

The Theatre department class of 2019 has chosen Lucy Prebble's play *The Effect* to present as their capstone project. This capstone project allows those in our senior class to showcase their theatre education, developed throughout their undergraduate studies: direction, design, and performance. Our class spent three semesters researching various areas of theatre to decide on a script for our capstone project. Prebble's script presents a current depiction of social issues surrounding mental health with complex characters and invigorating design opportunities. *The Effect* explores human connection through themes of love and depression in the context of a pharmaceutical drug trial. As the doses increase throughout the trial, two volunteers are unsure if they can trust what they feel towards each other. Two doctors overseeing the trial must face their own feelings as the trial runs the risk of being jeopardized. Prebble forces the audience to examine their own emotions alongside the characters. Our class has expanded our project to include a special immersive performance on April 12th, 2019. On this night we will have costumed front of house staff as well as "drug" dose increases that the audience may take part in alongside the main characters. The inclusion of immersive theatre expands the types of performance we employ at Southwestern. This also intertwines with Prebble's theme of keeping the audience involved in the play's trial, further pushing the audience to question themselves alongside the characters. Once the production is over, we will receive professional critiques to further our theatre education.

INDEX

- Aanstoos, Sister Maria Reginald F., 38
Adrian, Sherry, 38
Alexander, Steven, 7, 8, 9, 22, 43, 44
Ali, Maryam, 14, 47
Anthony, Barbara, 40, 41, 42
Argueta, Alek, 39
Axtell, Taylor, 41
Bajomo, Eunice, 38
Baker, Macie, 14
Ballesteros, Elijah, 14, 37
Barry, Elizabeth (Lizzie), 10
Barton, Kendall, 10
Bautista, Sister Anthony Marie R, 38
Bazan, Paola, 51
Beam, Avery, 30, 31
Bechtel, Kerry, 51
Beckelhymer, Daniela, 42
Bell, Alexandria, 32
Bell, Calie, 51
Berroth, Erika, 32, 33
Bienvenu, Allison, 38
Boatwright, Abigail, 17
Boutris, Melina, 33, 38
Boyd, Sara, 7, 40, 41
Brackmann, Sarah, 2
Bradford, Allison, 38
Brockman, Ben, 14
Brockway, Sister Mary Concepta, 38
Brown, Danielle, 14
Brown, Naomi, 48
Brown, Stacie, 6
Brown, Zhazze, 38
Broyles, Michael, 26, 47
Brungardt, Sister Lucy Fidelis, 38
Bruno, Samantha, 51
Buchanan, Sarah, 14
Bueno, Violeta, 32
Burks, Romi, 21, 35
Byrnes, Melissa, 23
Byron, Reginald, 23
Calleja, Isabel, 12
Carrola, Madeline, 24
Casazza, Jake, 51
Caudell, Kathryn, 39
Cepeda Lozano, Lizzeth, 12
Chreng, Karonech, 27
Ciotti, Veronica, 24
Colegrove, Audrey, 43
Collins, Caroline, 22
Cooper, David, 36
Cortez, Dakota, 49
Cox, Samuel, 15
Crawford, Chris, 7
Crockett, Erin, 45, 46, 47
Crowley, Elizabeth (Ellie), 10
Davidson, Thomas, 14
Dimanche, Alexis, 6, 44
Dings, Abigail, 12
Dolson, Emily, 42
Doss, Ella, 48
Dowdell, Byron, 14, 15
Drum, Chloe, 51
Dulthummon, Dean, 6
Dunn, Emily, 47
Dyo, Katherine, 40
Earle, Abigail, 14
Edwards, Rebecca, 7, 8, 44
Eggers, Brennan, 7
Evans, Tristin, 51
Ewton, Annalee, 38
Ewton, Katelyn, 10
Fetchel, Nathan, 44
Flores, Madison, 10
Ford, Lucas, 37
Forteith, Morgan, 10
Fray, Rachel, 34
Friedman, Adina, 20, 41
Fulcher, Devon, 43
Futamura, Fumiko, 6
Ganzell, Sandy, 20
Garcia, Benjamin, 23
Garcia, Iván, 50
Garcia, Jesus, 14
Gary, Mary Emma, 38
Gauder, Alisa, 28, 29, 30, 31
Gesinski, Michael, 36, 37
Gibson, Christina, 14
Gillespie, Lauren, 41, 42
Glover, Gillian, 12
Gockel, Scout, 33
Godleski, Madison, 8
Gonzalez, Chantal, 47
Gonzalez, Martín, 22
Gonzalez, Mercedes, 20
Granier, Madison, 21
Graves, Sarah, 14
Gressett, Taylor, 38
Grona, Alison, 14
Grooms, Katherine, 15, 16, 17, 18
Guarraci, Fay, 47
Hallmark, Ethan, 18
Harding, Claire, 7, 8
Harris, Katie, 39
Hartsell, Rehgan, 38
Harville, Thomas, 8
Haskell, Halford, 26, 51
Hattan, John, 16
Hellmer, Katlyn, 4
Henderson, Markell, 16
Henkel, Cameron, 7, 41, 42
Heo, Danbi, 4
Hernandez, Carmen, 25
Hicks, Luke, 8, 44
Hobelman, Chayce, 17
Hobgood, Laura, 22
Hoffman, Alexander, 14, 40
Hollingsworth, Bryan, 19
Housson, Emma, 14
Howard, Jonathan, 8
Howard, Kyle, 9
Hower, Jessica, 23
Huber, Gracie, 14
Hussein, Nour, 50
Hyatt, Chandler, 22
Ibarra, Myriam, 11
Jennings, Brandon, 38
Jimerson, Jacob, 6, 43
Johnson, Melissa, 49, 50
Johnson, Nalyah, 12, 13
Joyce, Conner, 28
Justus, Catherine, 48
Kaeller, Harrison, 14
Kamen, Adaire, 14
Kamen, Michael, 14
Kannegieter, Stan, 15, 43
Kellogg, Danyale, 11, 28, 32
Kelly, Nicole, 35
Kimbell, Isham, 51
Knight-Turcan, Kai, 18
Krumwiede, Camille, 51
Lalejini, Alexander, 42
Lambert, Bonnie, 51
Laude, Samuel, 51
Leadbetter, B.G., 10
Lin, YingRan, 18
Long, Joshua, 27, 39
Longuet, Lindsey, 14
Lovell, Austin, 10
Lowe, Maria, 24, 25, 26
Lucero, Devon, 47
Luna, Abigail, 14, 38
Lynk, Sister Monica Marie, 38
Mandelbaum, Isabel, 23
Marble, Stephen, 14
Martin, Camille, 28, 29

Maurival, Vasthy, 11, 50
 May, Michael, 9
 McCloughlin, Kelli, 14
 McConnell, Molly, 23
 McCormack, Justin, 9, 36
 McLean, Scott, 39
 Mekelburg, Wil, 14
 Melendez, Jose, 11
 Mendez, Antonio, 22
 Mendus, Alys, 14
 Merritt, Daniel, 14
 Mesquiti, Steven, 10
 Meyer, Robert, 37
 Mikan, Vanessa, 39
 Milburn, Joan, 51
 Miller, Shellsea, 21, 35
 Mims, Lacey, 22
 Mink, Aaron, 46
 Moffatt, Philip, 14
 Montreuil, Olivia, 45
 Moore, Alicia, 38
 Moran, Samuel, 51
 Mouat, Julianna, 36
 Murphy, Matthew, 51
 Muskara, Lauren, 4, 21, 35
 Nadeem, Ramish, 6, 18
 Nair, Megan, 11, 29
 Neighbors, Bryan, 48
 Neumann, Dylan, 39
 Newton, Summer, 14
 Niemeyer, Emily, 37, 38
 Norman, Tyler, 45
 O'Brien, Gregory, 14
 Odell, Shannon, 35
 Ofria, Charles, 42
 Olivieri-Puentes, Valentina, 33
 Olson, Emily, 48
 Olvera, Ana, 45
 Orantes-Orellana, Ian, 36
 Orbach, Danielle, 41
 Ore, John, 6, 51
 Oropeza, Sydney, 14
 Pentecost, Samantha, 25
 Perez, Gissell, 48
 Perilloux, Carin, 48
 Peterson, Breely, 31
 Pinero, Athena, 22
 Pollock, Meredith, 48
 Price, Jessica, 38
 Price, William, 6, 20, 41
 Pukys, Corinne, 10
 Quetzeri, Mariana, 38
 Rajtak, Nicole, 33
 Ramirez, Camila, 46
 Ramirez, Luis, 37
 Ramos, Esther, 10, 31
 Rasmussen, Meredith, 30
 Rativa, Karen, 6
 Rativa, Laura, 10, 30
 Read, Brielle, 25
 Renfro, Antonia, 14
 Reynolds, Amy, 51
 Richards, Kendall, 19
 Riley, Ruth, 48
 Ritz, Savannah, 11
 Rodriguez Cadena, Maria Ángeles,
 32, 33
 Rodriguez, Aimee, 36
 Rohde, Brittni, 10
 Rosario, Dominique, 11, 33
 Ross, Katy, 12
 Russell, Elizabeth, 14
 Rydell, Katie, 38
 Saenz, Kassandra, 49
 Savic, Dejan, 17
 Schrum, Jacob, 6, 19, 20, 41, 42,
 43
 Scott, Emily, 51
 Scott, Savannah, 24
 Scruggs, Colin, 41, 42
 Secord, Paul, 28
 Sendejo, Brenda, 31
 Shelton, Therese, 43
 Sheridan, Rebekkah, 51
 Shipp, Marissa, 5
 Shuttlesworth, Kathryn, 10
 Sinishtaj, Sister Teresa Casey, 38
 Sliheet, Elyssa, 6, 19, 41
 Smith, Hayden, 9
 Snyder, Robert, 28, 31
 Solis, Marisol, 14, 38
 Somolinos, Sebastian, 6
 Soto, Camille, 27
 Spence, Mackenzie, 11
 Stagner, Jake, 26
 Stankus, Olivia, 28
 Steinle, Aiden, 6
 Stoneburner, Trevor, 6, 51
 Stowers, Darby, 51
 Stubbs, Ty, 7, 44
 Sullivan, Michael, 10
 Sydnor, Emily, 29
 Szeto-Joe, Chris, 51
 Tate, Kayla, 46
 Tesmer, Emily, 29
 Ton, Betty, 10
 Tong, Nathan, 8
 Trevino, Alexandria, 7
 Trevino, Diana, 16
 Vandervalk, Jebb, 17
 Varner, Star, 4
 Vidana, Armando, 11, 12, 13
 Visser, Mary, 5
 Warren, Zane, 14
 Weigand, Willis, 33
 Wells, Aris, 9
 Willberg, Carl, 9
 Williams, Gordon, 22
 Winkler, Hannah, 21, 27
 Wolk, Miranda, 49
 Wood, Adam, 10
 Yager, Jacob, 41
 Yannon, Miranda, 48
 Yoxall, Simone, 27
 Zewail-Foote, Maha, 34
 Zuzeviciute, Marta, 26