

# Undergraduate Symposium on Research, Scholarship and Creative Activity

Sponsored by the Office of the  
Provost, Research and Sponsored  
Programs and University College

**TUESDAY, MARCH 21, 1-5 P.M.**  
Kent Student Center Ballroom, Kent Campus

“The opportunity to do  
research has enriched  
my undergraduate  
experience and solidified  
my career goals.”

- **Ashley Ferguson,**  
Senior, Speech Pathology  
and Audiology Major



# Welcome From the President



Congratulations on your participation in Kent State University’s fourth annual Undergraduate Symposium on Research, Scholarship and Creative Activity. Your involvement reflects a commitment of time and energy and a contribution to knowledge for which you should have a tremendous sense of accomplishment. Likewise, I take great pride in the creative, enterprising research activities of our faculty and undergraduates and look forward to further promoting student and faculty involvement in undergraduate research, annually showcased in this dynamic symposium.

Whether you are a student researcher or faculty mentor, thank you for expanding Kent State University’s mission of scientific discovery and engagement in diverse approaches to learning. Participating in research as an undergraduate student has the added benefit of clarifying career goals and improving critical thinking and communication skills - precisely the attributes that top graduate schools and employers are seeking.

I look forward to seeing you at today’s event.

With best regards,

A handwritten signature in black ink that reads "Beverly Warren". The signature is fluid and cursive.

Beverly Warren  
President

# Welcome From the Office of Academic Affairs



It is my great pleasure to welcome you to Kent State University’s fourth universitywide Undergraduate Symposium on Research, Scholarship and Creative Activity.

Upon graduation, you will go on to attend graduate or professional school, take a job in the private sector or in government, or volunteer in the community or abroad. No matter your choice, you will all face one challenge in common - how to use what you have learned here at Kent State in order to solve real-world problems.

By deciding to undertake a research project, a scholarly activity or a creative endeavor during your Kent State experience – an activity that has led you here to this afternoon’s symposium – you have chosen not to wait for the challenges to come to you after graduation. Instead, you have taken on these real-world challenges now!

Your research, scholarly and creative work throughout the past months or years speaks volumes about your drive, energy and enthusiasm for big challenges. I know that with this experience, you will go on to great things beyond Kent State. I congratulate you on your effort and I urge you to take pride in the accomplishments you are presenting today.

Sincerely,

A handwritten signature in black ink that reads "Todd". The signature is cursive and stylized.

Todd A. Diacon, Ph.D.  
Senior Vice President for Academic Affairs and Provost

## Welcome From the Vice President for Research and Sponsored Programs



Welcome to all the undergraduates involved in the fourth annual Undergraduate Symposium on Research, Scholarship and Creative Activity!

This symposium is a testament to Kent State's investment in research and its commitment to provide meaningful research experiences and creative scholarship opportunities for undergraduate students. Participation in the symposium has grown steadily over the past four years, and it is our goal that the number of presenters will double in the next few years.

As you have learned by now, hands-on involvement in research and creative activities not only prepares you for your next step – whether it be graduate studies or launching your career – but also can be one of the most memorable learning experiences of your undergraduate years.

Congratulations on your posters/presentations and the culmination of all your hard work.

Sincerely,

A handwritten signature in black ink, reading "Paul E. DiCorleto".

Paul E. DiCorleto, Ph.D.

Vice President for Research and Sponsored Programs

## Message From Symposium Planning Committee Co-Chairs

As co-chairs of the planning committee for Kent State University's fourth annual Undergraduate Symposium on Research, Scholarship and Creative Activity, we congratulate you for submitting your work and for being a part of this exciting event. If you were to take the time to review the more than 180 abstracts – as select members of our committee have done and symposium judges will do today – we are confident that you, too, would marvel at the range, depth and general excellence of the work being done by your fellow Kent State students, in collaboration with experienced and engaged faculty mentors.

Whether your individual project involves scientific research, an artistic work, a performance or an oral presentation, you are to be commended for your effort. You should likewise feel a sense of pride for the unique and valued contribution you are making to undergraduate research, scholarship and creative activity at Kent State University!

On behalf of this year's planning committee, we extend our best wishes for your continued academic success!

Sincerely,

A handwritten signature in black ink, reading "Doug Delahanty".

Douglas L. Delahanty, Ph.D.

Professor, Psychological Sciences, Associate Vice President, Research Faculty Development

A handwritten signature in black ink, reading "Ann Gosky".

Ann Gosky

Director, Office of Student Research

## About the Symposium

Hosting a symposium is a significant achievement, and the planning committee would like to thank all the departments and individuals who assisted in making this a successful event.

We would especially like to thank the chairs and directors, mentors, Sheila Pratt, Kevin Brosien and the University Communications and Marketing team, Rose Tran, Doug Nehrez and the IT team, Liz Richardson and all of our faculty, staff, judges and volunteers.

Again, thank you for your hard work, dedication and expertise. We are very appreciative of your assistance and look forward to future collaborations.





# Do Research!

“My undergraduate research has enabled me to expand my horizons, apply concepts and techniques I’ve learned in class and gain valuable experience.”

— Brandon Whitecotton, Senior, Biology Major



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# ARCHITECTURE - POSTER

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## Michelle Barrett, Senior, Architecture

Mentor: Brett Tippey, Ph.D.

Ildefons Cerda and l'Eixample: A Model for Urban Planning in the 20th Century

In the past, the walls of Barcelona were intended for protection. In 1850, the walls more so constrained Barcelona. The l'Eixample is the resultant solution to expand the city. Launched in 1859, the plan conceptualized a network-oriented approach far ahead of Cerdá's time. It re-imagined the city's preoccupation with hygiene, traffic and equality to which Cerda coined the term "urbanism."

This paper will describe the city's existing conditions and how Cerdá was receptive to them. Secondly, it will explore his theory and why it was pioneering in the context of an emerging urban planning movement. The following will analyze how Cerdá's strategies influenced the planning of future cities – is it a model? Investigation will consult the theory of Cerdá and Ebenezer Howard for comparative analysis.

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## Jonathon Davis, Senior, Technology

Mentor: Roberto M. Uribe-Rendon, Ph.D.

A 3-D Printer Arc Reactor Design

The project to be presented will be a 3-D printed design of an arc reactor with a usable tool set behind it. An arc reactor is a fictional device used as a sustainable, safe energy source used as a means of study for fusion. The project will be used

as a symbol stating that to make a brighter future, all it takes is an idea, ingenuity and creativity.

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## Abigail Dummermuth, Senior, Interior Design

Mentors: Pamela Evans, Ph.D., and Ji Young Cho, Ph.D.

How the Route Angularity Effect Influences Customer Behavior

Numerous studies have been conducted on the route angularity effect to explain and understand the relationship between the navigational behavior of customers and layout of department stores to increase sales. The question then arises, "In what specific ways does the route angularity effect influence the navigational behavior of customers and their buying habits within a department store?" Research was conducted over the course of four days over a one-hour

period. Results identified that customers felt the space was congested and way-finding patterns were difficult to discern. Overall, even though the data supported the implications the route angularity effect had within the Universo Sport Duomo department store, further research is necessary to develop a better understanding of the relationship between the customer and the department store layout.

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## Katelyn Hannigan, Senior, Architecture

Mentor: Peter Marks, M. Arch.

Climate Analysis Procedure

An architect or engineer's priority within the design process of a building begins with the climate analysis. In this study, a standardized procedure was produced to ensure an effective and efficient process. Current methods of climate analysis can be arbitrary with vague standards, which could lead to redundant information. Among the resources, climate consultant was the main factor in completing the climate

analysis in this study. Many of the graphs produced by the system break down the information into time specific graphs. By minimizing the findings to annual graphs when available, it reduces the decoding process of multiple repetitive graphs; therefore, speeding up time while ending with the same desired results.

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## Caitlyn M. McCausland, Senior, Architecture

Mentor: Brett Tippey, Ph.D.

Jewish and Moorish Influence on Mid-Twentieth-Century Spanish Architecture

Spanish architecture is rife with various architecture influences over the course of history. In particular, the influences of Moorish and Jewish styles on Spanish architecture has been present since the Inquisition. Moorish and Jewish art and architecture was coveted by the Spanish, but the culture was refuted and discouraged in Spain. This

investigation will analyze references to Spain's Jewish and Moorish heritage, and it will argue that, despite the anti-Semitic rhetoric, Spanish architects knowingly accepted Jewish and Moorish influence in their work.

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## Mary Myers, Senior, Architecture

Mentor: Brett Tippey, Ph.D.

Modernisme in Urbanized Catalonia

The economic prosperity that resulted from rapid urbanization during the late 19th-century provided the Catalonians with the awareness, resources and wealth needed to find an identity. Modernisme was the artistic and architectural response to this prosperity. This paper will discuss how the works of Modernista Josef Puig i Cadafalch solidified the Catalanian character during the critical days of the early 20th century.

By examining this topic, I will argue that Cadafalch embraced Modernisme and celebrated the optimism of the current day by honoring the properties of materials, acknowledging function with aesthetics, and creating asymmetrical forms. I will conduct this investigation by cross-referencing the architect's personal writings, drawings and sketches with secondary historical accounts of the political and cultural, and architectural atmosphere.

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**Aaron Penn, Senior, Applied Engineering**

Mentor: Roberto Uribe, Ph.D.

Design of A Self-Sustainable, Low-Cost Home

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A design of a low-cost home that is completely self-sustainable is presented. This home will be capable of producing its own food and energy, in addition to harvesting rainwater to be filtered, and tailored to fit the modern urban lifestyle. The home will be constructed of sustainable materials and will feature large windows and glass sliding

doors. Its flat roof design will be able to capture rainwater and harvest energy from the sun. To produce food, the home will also have a greenhouse and a separate area for free range chickens. The agricultural design of the home may also qualify it for tax breaks for the property owner.

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**Jessica Schultz, Senior, Architecture**

Mentor; Brett Tippey, Ph.D.

Miguel Fisac’s Direct Influence in Modern Spanish Architecture Through Concrete Innovation

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During the late 1900s, Spain encountered a new spirit and sense of optimism, one phase of which was ushered in by Franco’s dictablanda. This new leniency allowed for more freedom in not only politics or social constructs, but also architecture. One very obvious example of this optimism in architecture is illustrated through Miguel Fisac’s bone

architecture, which is known to have heavily influenced the modernization of Spanish Architecture. This paper will argue that his work has done so by influencing work of architects to follow him such as MVRDV and Ensamble Studio. Primary and secondary sources will be used to support this claim

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**Faris Turkistani, Senior, Architecture**

Mentor: Brett Tippey, Ph.D.

The Modern Elements Inside Moorish Spatial Design

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For 700 years, Muslims ruled the Iberian Peninsula. In that period, a unique architectural vernacular was established combining the traditional Islamic architecture with the locals with familiarity of the land. This architectural combination resulted in innovative methods of designing the spatial qualities that was a vast improvement over the architecture of Visigoth. Buildings such as Alhambra and the Great Mosque of Cordoba show excellent spatial qualities that improve the experience and provide aesthetic and

functional properties. The architecture of Spain from the 19th and 20th centuries has been perceived as an imitation of regional styles. However, the adaptation of Andalusian architecture resulted in a rational architecture with modern sensibilities. The research aims to analyze the reasons for these successful designs in and their relation to Moorish architecture.

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**Felipe J. Valadez, Senior, Architecture**

Mentor: Brett Tippey, Ph.D.

The Exiled Spanish Architects and Their Influence Now in Mexican Architecture and Culture

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As exiled Spanish architects lived in Mexico, they continued to practice and develop their ideas of modernity, eventually creating a new hybrid Mexican-Spanish form that redefined the Mexican form. With the Spanish Civil war at a conclusion and the Republic of Spain in exile, Spanish architects were among those exiled, leaving Spain with what seemed as small setback in finally realizing a Spanish architecture. With some of these influential architects flowing into Mexico, the Mexican architecture was changed and greatly influenced by these new Spanish revolutionaries and, even

to this day, we can see a great deal of Spanish architecture in Mexican architecture. Sources will include drawings, personal journals, published works, etc. written by architects including works by Juan Ignacio, Felix Candela, Fernandez Balbuena, and Giner de Los Rios and others like them along with architects who studied under them. Looking at the next-generation architects will also be evaluated and considered.

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# ARCHITECTURE - ORAL

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**Rebecca Alanis, Senior, Architecture**

Mentor: Rui Liu, Ph.D.

Beneficial Use of Plastic Bottles in Sustainable Building Construction

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Yearly, 14 billion pounds of trash are compiled and much of it is plastic. More than 4.8 million tons of plastic are dumped into the ocean every year, thus, contaminating our waters and shores with garbage and endangering sea life. In an attempt to recycle plastic bottles and keep less waste from accumulating, there have been building projects that incorporated plastic bottles in building construction. From Oscar Mendez’s projects, to the plastic bottle village created

by Robert Bezeau, or from communities in Nigeria using plastic bottles to create a building that is both bullet and fire proof, all prove that this material can be integrated with our construction methods. This study investigates how plastic bottles form structurally sound buildings through different construction methods.

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**Devin Heinlein, Senior, Architecture**

Mentor: Brett Tippey, Ph.D.

Eduardo Torroja and the Introduction of Reinforced Concrete to 20th-Century Spain

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During the early 20th century, Spanish architecture largely ignored global technological and stylistic advancements in favor of creating a national style. They looked back to past works, mostly for their aesthetics. However, engineer Eduardo Torroja began to experiment with reinforced concrete in both the common Historicist style and the budding Rationalist style. His work introduced Spain to a new way of designing buildings

Previous focus on Torroja’s work has been on his advancements in rationalism. By examining Torroja’s writings, critical reviews of his work and his original drawings, this paper will look at his early usage of reinforced concrete. This paper will show how this new material influenced Torroja and his contemporaries to reconsider reinforced concrete as a primary material.

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# ART/FASHION - POSTER

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## Stewart Blackwood, Junior, Theatre Studies, in collaboration with Ross Downing, Junior, Music Education/Music Technology

Mentor: Nicholas Drashner, M.A., M.F.A.

Sound Design and Composition Studio Collaboration

This project is a collaboration between theatrical sound design and music composition departments. Our goals for the project are professional grade recordings of experimental compositional pieces for the underscoring of this spring's main stage production: Shakespeare's Macbeth. Working together, we can experiment with different ways of crafting and experimenting with sounds. Through this process, we

hope to expand the way all parts of the team think about creating feeling within an audience. We can raise the level of sound design for productions at Kent State University, and increase both the exposure of composers' works as well as their levels of experimentation.

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## Madison Booth, Senior, Fashion Design

Mentor: Linda Ohrn-McDaniel, M.F.A.

Who's The Fairest: A Study on Gender in Fashion

"Who's the Fairest?" is a gender-neutral collection inspired by the gender roles instilled on us as children through mediums like fairytales. In the classic stories, the prince is always strong and brave, and the princess meek and quiet. After researching various online pleas and talking to members of the LGBTQIA community, I've noticed several concerns related to design and functionality. I also looked at gender-neutral fashion companies and noticed a disheartening

trend: most of these "progressive" lines were manufacturing shapeless, muted garments that closely resembled oversized menswear. Therefore, I used historic details and a soft color palette to design a collection for bodies that are masculine, feminine and anywhere in between.

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## Jack Bowers, Senior, Fashion Merchandising

Mentor: Catherine Amoroso Leslie, Ph.D.

"American" Cowboy Style: Global and Historical Origins of Clothing of the American West

Clothing fashions have evolved through institutions that existed for the purposes of trading goods coupled with the effects of cultural melding. "Inventions" of the American West are often seen as completely original or wholly American. This research explored the idea that, from their conception, aspects of cowboy apparel and garments of the American West can be traced to more than one or two continents, including influences from Europe, Asia and the

indigenous inhabitants of both North and South America. The findings of this study can develop recognition of the cultural connectivity and global nature that have always been defining features of fashion and costume. This will encourage a positive outlook of ways in which fashion reflects differing cultures and human interactions.

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## Rachel Broas, Senior, Fashion Design

Mentor: Kendra Lapolla, M.F.A.

The Growth of a Full-Time Fashion/Lifestyle Blogger

Blogs and social channels have the ability to connect readers and the content creator/website owner in a way that normal company marketing cannot. This study investigates what methods are used to grow blogger platforms, along with which methods are used in order to monetize their creative content. Upon IRB approval, online surveys will be administered to full-time fashion and lifestyle bloggers to study further in depth the steps bloggers take in order

to run a full-time career of their websites and social media channels. Preliminary research and findings suggest through brand partnerships, blogger relationships, SEO optimization and the utilization of social media, bloggers have the ability to go full-time.

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## Ashley Buersmeyer, Senior, Dance; Brittany Kloes, Senior, Chemistry; Madison DeLong, Senior, Dance; and Abigail Schneider, Senior, Dance

Mentor: Jeffrey Marc Rockland, M.F.A.

East Meets West: A Tribute to King Bhumibol Aduyadej

In January 2017, nine Kent State University students traveled to Bangkok and Hua Hin, Thailand, to collaborate with six graduate students from Suan Sunandha Rajabhat University. While in Thailand, the students were curious to observe whether a group of American students could effectively ally with Thai students and guest faculty to co-create a work of choreography honoring the passing of the late King of Thailand. The participants shared their artistic cultures and exchanged their styles through student-

taught technique and improvisation classes. They brought this newfound knowledge into rehearsals to successfully create an eight-minute piece that utilized pointe, jazz and Thai Classical dance styles. This collaboration supported the research and development of new forms of artistic expression that represent diversity and promote global understanding.

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## Evan Costello, Senior, Fashion Design

Mentor: Vincent Quevedo, M.S., M.F.A.

"Cruising" Senior Collection

"Cruising" is my graduating collection as a senior fashion design student. I was originally inspired to create this collection by the legendary 1969 Stonewall Riots in an attempt to both fully accept and celebrate my culture and its history. During the design process and the resulting final collection, I have attempted to explore the modern male experience.

Some of the styling and fit of garments in the collection is overtly feminine, which illustrates a cyclical relation

between masculinity and femininity; overcompensating with manliness often leads to the reverse. Other garments are faithful recreations of athletic uniforms, which act to mock the expectation of all men to be athletic. Through the final collection, I have attempted to illustrate society's specific expectations for what a straight man should be, and what he can't be. I believe these expectations are often a factor in the troubling and hateful actions of man.



<b>Kendall de Perrier-Lewis, Junior, Fashion Design</b> Mentor: Catherine Amoroso Leslie, Ph.D. Oppression: A Creative Exploration Based on Stigmatization of Clothing Throughout History	
This research explored the concept of stigma in dress history and used it as creative inspiration. Clothing can make us identify as individuals or with groups, yet also can serve as vehicles for isolation and discrimination. These include religious oppression, constricted garments, sumptuary laws, along with language and nomenclature. Through primary and secondary research sources, instances of stigmatization through dress were identified. These served as a foundation	for creative exploration, producing five contemporary fashion looks and one example garment. This study expands our understanding of oppression within society and how we can learn to harness stigmas and use them as a tool for empowerment.

<b>Gabriela Discepoli, Senior, Fashion Design and Kendra Lapolla, M.F.A.</b> Mentor: Kendra Lapolla, M.F.A. VIAJIYU Collaboration – An Experiment in Co-Creation and Design	
The purpose of this study is to explore collaborative design opportunities in the footwear industry, specifically for VIAJIYU, a small made-to-measure women's shoe company based out of Florence, Italy. After completing a market research survey, design ideas were created based on customer preferences and further evaluated by lead	customers from the survey. This research study helped to build on an understanding of the opportunities of co-creation among custom shoe design and development, with a focus on the impact of current VIAJIYU customers.

<b>Miriam Ennin, Senior, Fashion Design</b> Mentor: Ja Young Hwang, Ph.D. Unveiling Perceptions	
Unveiling Perceptions is a high-end bridal collection that utilizes the silhouette and layering lines of an onion as a symbolic representation of the idea that perception is a matter of what is seen rather than what is a matter of fact.	While the flaws that we may see in ourselves may be our definition of weakness, they are seen as treasures in the eyes of those who cherish us the most.

<b>Emily Gambone, Senior, Fashion Merchandising; Tara Kickert, Senior, Fashion Design; Kayla Hamilton, Senior, Fashion Design; and Adriana Young, Junior, Merchandising</b> Mentor: Lisa Valendza Development of Product Line for New Market Segment for Coastal Pet Products, Inc.	
For our product development capsule project, we were challenged to design and promote a new product line for Coastal Pet Products, Inc., to increase visibility and market share while targeting millennials. We focused on millennials who travel and move often, and our research into their lifestyles led us to create “NOMAD”–multifunctional and aesthetically pleasing travel-oriented products. Our project	was one of seven chosen to present to Coastal Pet Products, Inc., who determined that ours was superior in terms of market research, product design, marketing strategy, and potential saleability. We sold our intellectual property to Coastal Pet Products, Inc. officials who are looking to incorporate our ideas into their future lines.

<b>Victoria Haworth, Senior, Fashion Merchandising</b> Mentor: Jihyun Kim, Ph.D. Vive la Révolution: An Examination of the Fourth Industrial Revolution and Its Impact on Various Industries, with a Specific Focus on the Fashion Industry	
The Fourth Industrial Revolution is the latest installment in a series of major technological and manufacturing developments; however, it is proving itself vastly different from its predecessors, due to its speed and widespread effect. The revolution stands to impact all industries across the globe, leaving no business or person untouched, including the fashion industry. This study, therefore, aims to deepen the understanding of the current and future impacts of the Fourth Industrial Revolution on the fashion industry and	explore plausible solutions to champion fashion’s embrace of the Revolution. If the industry is to survive, it is vital that it incorporate technological advancements, including artificial intelligence, robotics, and 3-D printing, with developments in materials science, in order to find new and sustainable ways of satisfying consumer desires.

<b>Devin Hilt, Senior, Fashion Design</b> Mentor: Linda Ohrn-McDaniel, M.F.A. Sempre Sposa	
“Sempre Sposa” is a bridal collection that explores the idea of multi-use wedding dresses. The bridal industry has developed a tradition of one-time-use garments, which ends up limiting the value of the dress to only one day. If the life cycle of a wedding dress can be extended, the bride can receive a greater value for the cost of her gown. This thesis investigates how designers can change this one-time-use culture and create wedding dresses that can be used after	the ceremony. The results are an eight-look collection of bridal gowns that can be converted into 85 different garment pairings. These findings are an example of how a wedding dress can be designed for multi-use and allow the bride to receive the full value of her dress.

<b>Haviet Huong, Junior, Fashion Design</b> Mentor: Catherine Amoroso Leslie, Ph.D. The Maker: An Innovative Artisan Apparel Brand and Retail Partnership	
The millennial generation is driving changes in many aspects of the retail industry. These consumers crave authenticity, limited availability and quality products, along with sustainability and social responsibility. This study investigated opportunities presented by a partnership between Etsy and Macy’s, with research guiding development of a new clothing line and marketing strategy that addressed millennials’ unique demands while presenting a partnership model that can be successful for all	stakeholders. The Maker is an innovative apparel brand that connects the designer with the artisan, the artisan with the end-user customer, and traditional handicraft with modern technology. The shopping experience features customer-interactive technology, demonstrating that by harnessing individual strengths, firms can work collaboratively to flourish in a rapidly changing retail landscape.

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### Sarah E. Johnson, Senior, Fashion Design

Mentor: Linda Ohrn-McDaniel, M.F.A.

Woman Holding a Balance

This thesis focuses on empowering feminine design through the application of historic reference to the Dutch Golden Age in order to assert fashion design as a form of engineering.

The process of an engineer and a designer are one and the same: conceiving, innovating and creating to artfully bring something about. I propose to present the elements of this research so as to reconcile design as a form of engineering in

a way that reflects my own analytical approach to fashion design. There will be particular emphasis on advanced patternmaking, tailoring and construction techniques that emphasize the calculation and craftsmanship involved in translating conceptual design into a wearable form.

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### Jaanai Jones, Senior, Fashion Design

Mentor: Linda Ohm-McDaniel, M.F.A.

Equipped

This senior collection examines the idea behind firefighter uniforms. The sole purpose of the uniform is about protection and equipping the firefighter in multiple environments. The purpose of this collection is to equip the wearer with modern,

fashionable pieces that are comfortable and functional in multiple conditions.

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### Sarah Kauffman, Senior, Fashion Design

Mentor: Linda Ohrn-McDaniel, M.F.A.

Intergalactic Space Princess: A Study in Volume and Line

The B.F.A. collection “Intergalactic Space Princess” examines stripes and their relationship to volume using surreal or trompe l’oeil effect printing and beading. Beyond the basic concept of line and volumes, the collection also follows a comic book narrative of a space princess in her travels through a wormhole, landing in 1970s New York. After much dancing and exploring, she decides to stay on Earth and enjoy life in the city. This collection is directed towards

a high-end luxury and couture market. Especially in the world of couture, fashion is an escape from reality, telling creative and well-marketed stories. This collection serves as a lighthearted narrative of a space princess while still challenging the design of each garment with the principles of line and volume.

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### Arianna Likouris, Senior, Fashion Design

Mentor: Linda Ohrn-McDaniel, M.F.A.

Aphosiosi

Aphosiosi means “loyalty” in Greek. This is a non-traditional eveningwear collection illustrating the idea of loyalty to one’s culture, community and upbringing. Research included looking at symbolism and motifs, collaging to form shapes and silhouettes, print development, sketching, and reading about cultural loyalty and the psychology behind it. First and second muslins were sewn and critiqued throughout the

semester, which helped to refine the collection and lead to its final stages. The goal of this collection is to get the viewer to understand and think about how one can obtain a sense of identity through their heritage. As a result, Aphosiosi symbolizes the passion one has for their culture and the identity that is kept throughout their life.

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### Grace Lilly, Senior, Fashion Merchandising

Mentor: Jewon Lyu, Ph.D.

3-D Printing and the Millennial Generation

The following research depicts the attitudes of millennials towards technology, and more specifically 3-D printing. Millennials will be the first generation to acclimate themselves to the changing technological landscape largely because of their fluidity and ease with using various methods of technology in their everyday lives. 3-D printing will begin to be a common practice for apparel production and will one day make the shift into consumer’s homes. 3-D

printing will fulfill the desire of millennials to incorporate mass customization into their everyday lives. This research is designed to explore the millennial generation’s attitudes towards 3-D printing. It is expected millennials with prior experience with 3-D printing will be open to pay a fee as well as exhibit positive perceptions towards 3-D printing.

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### Gina Lytz, Senior, Fashion Design

Mentor: JaYoung Hwang, Ph.D.

Ruthie

What is the most effective way to embed a story into a collection? I used this opportunity of designing a thesis collection to pay homage to an important person in my life. Earth tones, minimalistic silhouettes and the manipulation of toile wallpaper are used to tell her story. This particular

wallpaper is the one I remember covering the walls of her house when I was a little kid. I want it to be apparent there is a deeper story behind this collection.

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### Emily McCullough, Sophomore, Fashion Merchandising

Mentors: Catherine Amoroso Leslie, Ph.D. and Harriet McLeod, Ph.D.

Product Safety Recalls in Children’s Wear: What Does the Consumer Know?

Media coverage of safety recalls in children’s products often includes hard goods such as child seats and furniture.

Soft goods, such as children’s wear may also contain potential hazards that can lead to choking, scratching or other injuries. Current safety guidelines recommend that snaps, buttons, etc. be used instead of drawstrings in children’s wear because of the potential for strangling. Using a content analysis approach, the researchers will

explore the product safety laws and violations that have occurred in children’s soft goods such as apparel, footwear and accessories over the past three years and how these violations have been communicated to the fashion industry professionals and consumers.

<b>Marissa Mally, Senior, Fashion Merchandising</b> Mentor; Jewon Lyu, Ph.D. <u>Wearable Technology - More than a FitBit</u>	
The latest innovations in technology are changing every day. One of the largest growing fields is that of wearable technology. Roughly 20 percent of American adults say they use some sort of wearable technology. However, many Americans, while excited for the future of wearable technology, are not thrilled with the options available to them at this present time. However, after being accepted by general public, there is still another hurdle wearable	technology faces.  In my research, I will be looking to see how companies can work to improve their existing technologies, while also expanding the scope of the information they provide. The focus will go beyond simple fitness trackers to show the ever-expanding future of wearable technology.
<b>Morgan Manuel, Junior, Fashion Design</b> Mentor: Archana Mehta, M.A. <u>Minimal Waste Athletic Wear</u>	
The fashion industry has long been guilty of having a negative impact on the environment. One such issue is the generation of textile waste during production. In the traditional pattern making and fabric cutting approach, up to 15 percent of fabric is wasted, which, if not recycled ends up in landfills. Zero-waste cutting is a design approach focused on sustainability where no fabric is wasted during production. My challenge was to design a wearable and practical athletic apparel, suitable for running, but utilizing	zero-waste methods. The result was a three-piece athletic outfit comprised of a T-shirt, sports bra and leggings combining aesthetic appeal, functionality and sustainability. This project is unique as not much research has been conducted combining zero-waste cutting with active sportswear.
<b>De’Marcus McWilson, Junior, Fashion Merchandising</b> Mentor: Catherine Amoroso Leslie, Ph.D. <u>Spirits in Unity: Inclusion in Fashion History</u>	
Fashion reveals fundamental aspects of the culture in which it is created. This research explores our ancestors history of style, uncovering information that is often overlooked. In an effort to increase diversity this study uncovered contributions to fashion and costume made by those of African and African American descent as well as other ethnicities from pre-history to the present day. By including this in class material students can collectively understand	each other by accessing information, mixing cultures and histories together. Titled Spirits in Unity, this study expands closed minds to new thoughts, showing we are as one. This research demonstrates a wide variety of individuals participated in and influenced fashion, fostering a stronger connection and unity with the spirits of our past.

<b>Ashuna Moore, Sophomore, Fashion Merchandising</b> Mentors: Harriet McLeod, Ph.D., and Marji Wachowiak, M.S. <u>A Study of the Effectiveness of Using Display Cases to Promote Knowledge Retention</u>	
Students in the Fashion School learn how to create presentations that are persuasive and efficient forms of communication. Other courses provide students with core knowledge about the fashion industry. A concern among us as students is retaining the knowledge we learn in classes. One way to do this is to continually practice what we have learned or engage with that learning in some manner.	The purpose of our research is to learn if we can affect comprehension and knowledge retention through exhibits we mount in display cases inspired by the statement “I wish I remembered ...”We will gauge the effectiveness of our exhibits by asking our fellow students to complete a short survey.
<b>Mycala Nichols, Senior, Crafts</b> Mentor: Rachel Smith, M.F.A. <u>Golden Thesis</u>	
After graduation, I plan to become a fine jeweler. I want to work with gold for my senior thesis. I want to make comparisons between precious and non-precious materials and how fine jewelery is influenced by these properties.  I will use Rhino 5 to design each of the pieces then use the resin printer at Kent State to create high quality prints that I will then cast in house using gold.	I have previously used the online company Shapeways to print my designs. Having the opportunity to cast my own work for my thesis would make me more marketable to employers after graduation.  Having the opportunity to create a series of gold rings for my thesis would directly reflect what I plan to do with my future.
<b>Abigail Noonan, Senior, Fashion Design; Diane Scillia, Ph.D.; and Catherine Amarosa Leslie, Ph.D.</b> Mentors: Catherine Amarosa Leslie, Ph.D., and Diane Scillia, Ph.D. <u>Interpreting Northern Renaissance Art and Fashion Through 21st-Century Mediums</u>	
There are many intersections between art history and fashion history. Through the course of this research we developed a way to visually communicate the birth of fashion in the Northern European Renaissance with the objective of making this content interesting and accessible to the 21st-century audience. After careful consideration we developed a system for categorizing the artworks and information collected, along with examples of contemporary fashion. The system was organized and displayed in	an appealing web format that reflected a social media presence designed to engage digital natives. This included interactivity to maintain viewer interest. We constructed a website that incorporated this research in an exciting and cohesive way. This research demonstrated that fashion history and art history can be made relevant to modern audiences.



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**Paula Oyedele-Caleb, Senior, Fashion Design**

Mentor: Ja Young Hwang, Ph.D.

Pawada: Distinguishing the Lines Between Appropriation and Appreciation of West African Culture in the Western World

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This study is primarily concerned with the possibility of redirecting cultural appropriation into appreciation in a way that is respectful to that culture, but with an innovative approach, so as to promote unity in a society that is so ethnically diverse. How can we protect the traditional parts of a culture in a way that can be appreciated by the mass society? The word “Pawada” is a Yoruba word, it means “to change.” More specifically, it translates roughly to “one

that has changed his ways”. This will be accomplished by utilizing aspects of fashion technology, such as digitalized prints and incorporating traditional elements from West African cultures; specifically, the Massai tribe of Kenya and Tanzania, Adire from Nigeria and color inspiration from the Kente cloth of Ghana.

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**Katryn Seeburger, Senior, Fashion Design**

Mentor: Linda Ohrn-McDaniel, M.F.A.

Lieblingspulli: Favorite Sweater

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How can artisan- and mass-produced goods be approached to form a collection that is sustainable, affordable and adaptable by the consumer? By considering how both production cycles have a place within sustainability, this collection proves that the current industry can be altered to be more mindful to benefit both consumer and retailer. Using personalized goods to supplement wardrobe staples, this collection created knitwear that allows the consumer to be

eased into choosing well-made goods to create a sustainable closet. This collection found that a wardrobe does not have to lose its individual identity in order to be sustainable; it just has to be more mindful of where and how each piece was created.

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**Delaney Sullivan, Senior, Fashion Design**

Mentor: Linda Ohrn-McDaniel, M.F.A.

S.ave O.ur S.eas

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S.ave O.ur S.eas encompasses both the beauty and ugliness within our oceans. As human consumption continues and our oceans are polluted and dying, phenomena such as the bleaching of the coral reefs occur, creating brilliant white

corals and a foreboding message. Sustainable solutions to consumption must now begin to be employed in our industries.

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# ARTISTIC PIECE

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**Austin Coats, Senior, Dance**

Mentor: Kim Karpanty, M.A., M.F.A.

“Caged Bird”: An Exploration and Poetic Demonstration of the External and Internal Mindset

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“Caged Bird” is inspired by the poem of the same title by Maya Angelou. The purpose of the piece is to show the contrast between a caged bird and a free bird, like Angelou speaks of in the poem. “Caged Bird” is also inspired by the choreographer’s journey in this new world of “dance”. After the choreographer was exposed to this unfamiliar world, the choreographer felt like a “caged bird” and would always escape to an introspective state. Yet on stage or other places,

the choreographer felt free. Questions as to “why was this happening” and “how can this be expressed” were explored. Through multiple trial and error investigations, showings, and various types of documentation, “Caged Bird” was created.

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**Madison Kalson, Senior, Fashion Design**

Mentor: Linda Ohrn-McDaniel, M.F.A.

Patterned Infringement

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Patterned Infringement explores the way copyright law affects the art and the fashion industry. Fashion collections often take inspiration from art or prints that are updated, reimagined, or changed. But there is a fine line between inspiration and copyright infringement. Taking indirect inspiration from the work of Yayoi Kusama and Nellie Row Mae I created prints. I further manipulated those prints by

combining them, laying other fabric over them and altering the print itself. Additionally, I played with the concept of a print by creating a pattern through embroidery. By doing this I show how to successfully use inspiration without infringing artists.

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**Dennis J. Meacham, Junior, Music**

Mentor: Keith Heinlein, M.M.

Low Register Studies

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This project was created to develop a method book written for tubists to develop their low register as an extension of their mid-register. The low register for the tuba is the most widely recognized aspect of orchestral tuba playing, such as in Wagner’s Ride of the Valkyries and Respighi’s Pines of

Rome. There is, however, a deficit in method books for tuba players to develop their low register. The few books targeting low register, unfortunately, were originally for other instruments and/or written by non-tubists.

**Ricki Robinson, Senior, Fashion Design**  
Mentor: Linda Ohrn-McDaniel, M.F.A.  
Altered

Altered is my response to the materialism facing the fashion industry. Designing this collection proves fashion is so much more than materials and fads. My inspiration is how the improper care of clothes can influence the design process. To emphasize the disposal of clothes, I experimented with different manipulations. Wrinkle pleating makes the garments appear as if they were just balled up and now it is

ready to wear. The majority of my garments in my collection are knitwear. I experimented with different techniques to resemble certain distressing properties. I have incorporated a smocking-like technique with the knits to resemble wrinkles, and to further stress asymmetry. This is a collection where consciousness and fashion meet.

# BIOLOGY/ECOLOGY - POSTER

**Ruthann Antolik, Senior, Biology, and Brettney Lamp, Senior, Biology**  
Mentors: David Ward, Ph.D. and Sara Tomiolo, Ph.D.  
Moth Species Diversity and Abundance Across Different Habitat Types in South Africa Savanna

The purpose of this study was to observe whether moth community composition changed across three different habitats within the South African savanna biome: woodland, ecotone and disturbed habitat. We expected the disturbed habitat to have highest abundance and richness because it is well lit, attracting many moths. Moth traps were set within each habitat by hanging white sheets and placing a lantern in their proximity to attract moths. Moths were collected

before dawn and subsequently classified by morphotype. Overall, there were more morphotypes collected in the disturbed habitat, as well as more moths collected overall. Our results suggest that there is limited overlap in morphotypes across different habitats.

**Allison Beckwith, Junior, Biotechnology**  
Mentors: Laura Leff, Ph.D. and Paul Ayayee, Ph.D.  
Effects of Stream Quality on Insect-Gut Associated Denitrifying Bacteria Abundance

Gut bacteria in macroinvertebrates in streams and rivers contribute to nitrous oxide (N2O) emissions from these systems through partial denitrification. Denitrification is an anaerobic microbial process which converts nitrates (NO3-) to dinitrogen (N2), removing excess nitrogen from these ecosystems. Poor stream quality negatively impacts the diversity and abundance of certain macroinvertebrate taxa, such as stoneflies, mayflies and caddisflies. Stream quality

impacted macroinvertebrate taxa, with more sensitive insect taxa present in WB relative to TC. Bacterial 16S rDNA gene, and the denitrification genes nirK and nosZ were detected in all samples. The quantification of bacterial genes in all samples, however, remains to be investigated.

**Paige Bidinotto, Senior, Biochemistry; Gemma Casadesus, Ph.D.; Jeff Blair, Graduate Student, Biomedical Sciences; and Sabina Bhatta, Graduate Student, Biomedical Sciences**  
Mentors: Gemma Casadesus, Ph.D.; Jeffrey Blair, Graduate Student, Biomedical Sciences; and Sabina Bhatta, Graduate Student, Biomedical Sciences  
Neuroanatomical and Cellular Localization of Luteinizing Hormone in the Mouse Brain

Previous work in our laboratory demonstrates the importance of luteinizing hormone (LH) signaling in learning and memory and AD, yet the neuroanatomical and cellular localization of LH has not been determined. Immunofluorescence was used to determine in which brain regions and cellular types LH are located. Immunoreactivity of LH is observed in areas associated with emotion as well as learning and memory, with high expression of LH

visualized in areas of critical importance in AD. Furthermore, we have also identified the expression of LH and GAD67 to be neuronally co-localized and the expression of LH to be localized to inhibitory neurons. Our findings demonstrate that LH localization and the co-localization of LH and GAD67 further support a direct role of this hormone in cognition.

**Jennie Brancho, Senior, Biology**  
Mentor: David Costello, Ph.D.  
Review of Regulatory Policies for Copper and Silver Water Quality Criteria

To combat climate change and urbanization, water management policies must be updated with the most current scientific information. We compared two metals, a well-studied pollutant (copper [Cu]) and emerging contaminant (silver [Ag]). We assessed water quality criteria for each from the United States, Australia and New Zealand, South Africa, Canada, and European Union for intent and implementation. Additionally, we conducted standard chronic toxicology

tests for silver and copper on the freshwater snail Lymnaea stagnalis to assess effectiveness of each regulation in protecting ecological integrity. L. stagnalis were individually placed in test solution (0-32 µg/L for Cu and Ag) for 28 days to measure mortality and growth. Preliminary results suggest greater Ag toxicity; however, Ag water quality criteria may not offer protection in some jurisdictions.

**Chuck Campana, Senior, Nursing**  
Mentors: Robert Clements, Ph.D. and Joshua Pollock, Ph.D.  
Evaluating Stereoscopic Effects with EEG of Memory Formation and Regional Brain Activity

Previous studies have indicated that students have trouble learning concepts that have a spatial component to them. Recent research has suggested that stereoscopic presentation of these objects may promote better learning. To understand the processes which contribute to spatial learning a neurophysiological approach is necessary. Therefore, in order to investigate the effectiveness of stereoscopic presentation and the neural correlates of it, an Electroencephalograph (EEG) was used. Participants

were presented with images in both 3-D and 2-D of an organic molecule. During the tasks, the molecule rotated across three different planes, changed colors, and changed focal distance. The data collected were then analyzed using EEGLAB for MATLAB. The brainwave activity in these components was recorded and the components were correlated with one another.

**Emily Creque, Senior, Biology; Priya Putta, Graduate Student, Biological Sciences; and Edgar E. Kooijman, Ph.D.**  
Mentors: Priya Putta, Graduate Student, Biological Sciences, and Edgar E. Kooijman, Ph.D.  
The Effect of Lipids on the Binding of Proteins Expressed under Stress in Plants

Diacylglycerolpyrophosphate (DGPP) is phosphorylated phosphatidic acid (PA). Under stress conditions, plants respond via signaling cascades, some involving regulating lipid metabolism. DGPP is a lipid that is elevated under stress, following a stress-induced rise in PA levels. We examined the lipid-protein interactions between DGPP and proteins that bind to PA to analyze a possible co-relation between these two lipids based on the proteins that they bind.

The preference of PA-binding proteins to bind DGPP may elucidate why PA levels are attenuated with an increase in DGPP levels. For this study, proteins were chosen from the literature based on stress-stimulated proteins known to bind PA. Liposome binding assays were used to study the affinity of protein binding to PA and DGPP in complex lipid membranes.

**Richard M. Cukelj, Senior, Biology; Elda Hegmann, Ph.D.; Ernest Freeman, Ph.D.; Jennifer McDonough, Ph.D.; and Robert Clements, Ph.D.**  
Mentors: Elda Hegmann, Ph.D.; Ernest Freeman, Ph.D.; Jennifer McDonough, Ph.D.; and Robert Clements, Ph.D.  
Use of Porous Elastomer Foams to Support Long-Term Three-Dimensional Neuronal Cultures

In order to effectively study the interactions that occur between neurons after an extended period of time and spatially in the brain, it is necessary to have reliable, repeatable studies. This is difficult with two-dimensional cell culture techniques. Here, we present a platform to study neuronal networks for extended periods in vitro using three-dimensional (3D) elastomer foams. Elastomer foams were constructed with pore sizes ranging from 150µm to

400µm with 40µm secondary pores which allowed human neuroblastoma cells (SH-SY5Y) to adhere and interact with the foam and be sustained for long-term studies, more than 60 days. Being able to sustain neurons for this long in 3-D arrangements allows for a better representation of 3-D tissues, making this method applicable for studying neurodegenerative disease states.

**Melanie Darrah, Sophomore, Zoology, and Joseph Fischer, Graduate Student, Biological Sciences**  
Mentor: David Ward, Ph.D.  
Summertime Foraging Behavior of South African Vervet Monkeys

We set up a giving-up density experiment with Vervet monkeys at the Wits Rural Facility in South Africa. We placed seven lidded buckets containing peanuts and wood blocks at different heights within, and distances away from, three marula trees. The blocks served as obstacles, mimicking the time and effort spent in natural foraging. The amount of peanuts eaten from each bucket after a foraging period indicates more favorable feeding patches. We realized the peanuts were not favorable due to high summer food

availability. Instead, we observed the monkeys, recording behaviors such as vigilance, foraging, and interacting with peers and offspring. These ethogram samples suggest the troop's comfort level in their environment, their apparent stress towards food availability, and their perception of nearby predation risk.

**Sydney Gilmer, Junior, Biology, and Daniel Krieger, Senior, Biology**  
Mentor: David Ward, Ph.D.  
Effects of Elephants on Vegetation Along a Fenceline Contrast in South Africa

We assessed the degree of damage of two common plant species, marula *Sclerocarya birrea* and the mountain aloe or flat-flowered aloe *Aloe marlothii* in two neighboring game reserves along a fenceline with respect to the presence of African elephants *Loxodonta africana*. One of these reserves, Thornybush, had 40-50 elephants while the other reserve, the Wits Rural facility, contained no elephants, although elephants had broken into a select region briefly during a recent drought. We measured the browse height of *S. birrea* relative to overall tree height and trunk circumference to establish the differences among the three different areas.

We also measured the presence/absence of *A. marlothii* in these game reserves. We found no *A. marlothii* in the reserve with elephants, while this plant species was quite common where there were no elephants, despite the absence of soil differences. In the section of the Wits Rural facility where the elephants had broken in, there were considerably more damaged *A. marlothii* than in the section of this reserve without elephants. We also established the association between the size of the aloe and elephant consumption.

**Heather Greier, Senior, Biology**  
Mentor: Gregory Smith, Ph.D.  
Population Dynamics of Feral and Free-ranging Domestic Cat Colonies with Implications for Management

As the population of feral cats increases in the U.S., the repercussions have both become apparent to scientists and caretakers and has sparked an increase in interest about this issue. While debates continue about the most effective control methods for these non-native predators, basic ecological data are lacking; for example, estimates of immigration and emigration rates into and out of feral

cat colonies. In a previous pilot study an attempt was made to add this important empirical data to the debate. Although results of the previous study were inconclusive, it became clear that these data were important and further investigation was warranted. Education of the public is also critical; without it, we cannot create a collaborative effort in enforcing these programs and reducing cat overpopulation.



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**Kayla Hamdan, Junior, Biology; Spencer R. Andrei, Graduate Student, Biological Sciences; and Derek S. Damron, Ph.D.**  
Mentors: Spencer R. Andrei, Graduate Student, Biological Sciences, and Derek S. Damron, Ph.D.  
Nitric Oxide Bioavailability in Diabetic Cardiomyocytes: The Role of Propofol in Superoxide Scavenging

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A pathological mechanism underlying diabetic cardiomyopathy involves the reaction of nitric oxide (NO) with superoxide to form peroxynitrite. We hypothesized that the intravenous anesthetic, propofol, would act as a superoxide scavenger, thereby increasing NO bioavailability in diabetic cardiomyocytes (CMs). CMs were untreated or treated with clinically relevant concentrations of propofol and loaded with fluorescent probes detecting NO, superoxide or peroxynitrite. NO fluorescence was decreased, whereas superoxide and peroxynitrite were increased in diabetic	CMs. Propofol administration increased NO bioavailability and returned superoxide and peroxynitrite levels to near baseline values. Our results indicate that NO levels are decreased in diabetic CMs due to its reaction with elevated superoxide levels, producing excessive amounts of peroxynitrite. Propofol treatment restored pathological NO, superoxide and peroxynitrite accumulation to near healthy levels.
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**Meghan Hollis, Senior, Zoology, and Abigail Soeder, Senior, Zoology**  
Mentor: Megan Griffiths, Ph.D.  
Dung Beetle Diversity and Species Richness Across Three Habitats in South African Savannah

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We examined dung beetle diversity and richness at the Wits Rural Facility in Limpopo Province, South Africa. The dung beetle community was assessed in three separate habitats: grassland, woodland, and ecotone. Diversity was measured by collecting one individual of each morphotype at each site the same day the dung was put out, and 24 hours after. Species richness over time was measured by going out to the dung pile locations different times throughout the day.	We viewed an hour after they were placed down, four hours after, and six hours after. We counted the number of beetles from each morphotype in each location. The number of morphotypes, and density of individuals of each morphotype decreased over time as the dung piles increased in volume.
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**Janarthanan Ilangovan, Junior, Biology; Abdulaziz Aloliqi, Graduate Student, Biomedical Sciences; and Gail C. Fraizer, Ph.D.**  
Mentor: Gail C. Fraizer, Ph.D.  
Does Cx43 Modulate the Motility of Prostate Cancer Cells

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Prostate cancer (PC) is one of the most common male cancers in the United States. PC lethality is due to its ability to metastasize, which is where the cancer cells move from the primary tumor site to a secondary site. We looked at a protein called Connexin 43 (Cx43) which is known to be produced at a higher rate in some prostate cancer cells. Our experiment involved first silencing the production of Cx43 in	metastasizing prostate cancer cells then measuring whether the cells' ability to migrate was affected. We found that inhibiting Cx43 production did reduce migration. The next step is measuring whether increasing Cx43 in non-migratory cells increases their motility. We hope that this will lead to new targeting strategies for PC treatment.
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**Savannah R. Justus, Senior, Zoology; Oscar Rocha, Ph.D.; Ferenc DeSzalay, Ph.D.; and Emma Given, Graduate Student, Biological Sciences**  
Mentor: Oscar Rocha, Ph.D.  
Agricultural Impacts on Aquatic Invertebrate Diversity and Abundance in Costa Rica

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Freshwater ecosystems are highly threatened by agricultural practices, which can have an impact on aquatic invertebrate communities. This experiment, conducted at the Alberto Manuel Brenes Biological Reserve in Costa Rica, sampled streams within the reserve, as well as streams within agricultural fields outside of the reserve. Biodiversity and abundance, and indicator score were recorded. Both indicator score (p=0.004) and indicator category (p=0.002) were significantly different between agricultural	and non-agricultural streams, indicating that agriculture has a negative impact on water quality. While the diversity was significantly higher in non-agricultural streams (p=0.026), the abundance between treatments was not significant (p=0.321). This suggests that agriculture does influence invertebrate communities by decreasing sensitive or rare taxa, but tolerant taxa that may perform the same function could increase from this.
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**Shelby Kelemen, Senior, Biology, and Taylor Bumbledare, Junior, Medical Technology**  
Mentors: Kristy Welshhans, Ph.D. and Leah Kershner, Graduate Student, Biomedical Sciences  
Expression of RACK1 and APP Is Increased in Human Down Syndrome Fibroblasts

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Down syndrome results from the trisomy of human chromosome 21 and is the most prevalent genetic cause of intellectual disability. Because receptor for activated C kinase 1 (RACK1) and amyloid precursor protein (APP) have both been implicated in the pathogenesis of Down syndrome, we hypothesized that their expression may vary in Down syndrome. Fibroblasts were obtained, and RACK1 and APP expression in these fibroblasts were labeled using quantitative immunocytochemistry. Preliminary results	demonstrate that both RACK1 and APP are overexpressed in Down syndrome fibroblasts, which may contribute to the pathogenesis of this disorder. In future experiments, we will examine how RACK1 mRNA localization may be dysregulated and the expression in neurons, to further study brain connectivity. These experiments will further advance the understanding of Down syndrome.
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**Hannah Kennedy, Senior, Biology; Matthew Russ, Sophomore, Biology; and Brett Lowden, Pre-College**  
Mentors: John Johnson, Ph.D., and Adam Kulp, Graduate Student, Biomedical Sciences  
The DREADDs Technique Utilized to Control the Hypothalamus-Pituitary-Adrenal Axis of Rodents

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This current work is a mechanistic study to determine whether we are able to activate the paraventricular nucleus (PVN) and ultimately increase rat corticosterone (CORT) levels though designer receptor exclusively activated by designer drugs (DREADD) technology. DREADDs have been used to control cellular activity in both a spatial and temporal manner to successfully analyze neural circuitry previously,	and are used in this experiment to induce transcription of cellular receptors to mediate the cell response, allowing control over circulating CORT levels (American College of Neuropsychopharmacology, 2012). It is hypothesized that once the CNO ligand has been injected and binds with the DREADDs, the PVN will be activated and result in an increase of CORT.
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**Kirsten T. Maricic, Senior, Biology; Amanda C. Klein, Graduate Student, Biomedical Sciences; Ashutosh Rastogi, Ph.D.; and Eric M. Mintz, Ph.D.**  
Mentor: Ashutosh Rastogi, Ph.D., and Eric Mintz, Ph.D.  
Altered Circadian Phenotype in Cannabinoid Receptor 1 Knockout Mice

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The suprachiasmatic nucleus of the hypothalamus drives daily rhythms of physiology and behavior. We investigated the role of endocannabinoids in regulating circadian rhythms, using mice lacking the cannabinoid type 1 receptor (CB1). Mice showed a number of behavioral differences from unaltered mice, including circadian disorganization, shorter free-running periods, and increased phase shifts in response to light pulses. After phase advances and delays CB1-/- mice display faster reentrainment rates compared to wild type mice. Mice show normal or increased food anticipatory activity to timed restricted feeding, but no increase in neuronal activation after nocturnal light pulses. These data suggest that cannabinoids play an important role in regulating circadian rhythms.

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**Carlyn Mitchell, Senior, Biology**  
Mentors: Gavin Svenson, Ph.D., and Nicole Gunter, Ph.D.  
Curating and Digitizing the Cleveland Museum of Natural History’s Bumblebee Collection

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Purpose: Throughout history, museums have curated specimens to document biological heritage. Research using curated specimens has been hindered due to inaccessibility to this resource, though. Because of the demand for data provided through properly curated specimens, this research aimed to identify the Cleveland Museum of Natural History’s bumblebee species, then to digitize this data.

Methods: Identification proceeded using dichotomous keys and voucher specimens. Bumblebees that were previously misidentified were also corrected and reorganized. Once identification was completed, digital transcription commenced.

Results: Thirty bumblebees that were previously identified were incorrect, necessitating re-identification. 103 undetermined specimens were also identified, including 5 new Bombus species previously unaccounted for.

Implications: Identity corroboration produced higher species diversity amongst the museum collection of Bombus. Results also indicate the necessity for identity corroboration to species level.

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**Nathan Mudrak, Junior, Pre-Medicine/Pre-Osteopathy; Priyanka S. Rana, Graduate Student, Biological Sciences; and Michael A. Model, Ph.D.**  
Mentor: Michael Model, Ph.D.  
Calibrated Brightfield-Based Imaging for Measuring Intracellular Protein Concentration

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Intracellular protein concentration is an essential cell characteristic that manifests itself through the refractive index. The latter can be measured from two mutually defocused brightfield images analyzed using the TIE (transport-of-intensity equation). To improve the accuracy of TIE, we have developed a calibration procedure that allows one to directly relate the output of TIE (T) to intracellular protein concentration C (g/l). The resultant relationship has a simple form:  $C \approx 1.0(T/V)$ , where V is the cell volume ( $\mu m^3$ ) and 1.0 is an empirical coefficient. We used calibrated TIE to characterize variations of C during the cell cycle and its recovery in HeLa cells placed in a hyperosmotic solution. We found that C remains elevated during the first 30-60 minutes but fully recovers after 20 hours.

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**Kati O’Keefe, Senior, Biology; Nirmala Ghimirey, Graduate Student, Biomedical Sciences; Shorog Al Omair, M.S.; and Gail Fraizer, Ph.D.**  
Mentor: Gail Fraizer, Ph.D.  
Mechanisms of Alternative Splicing of Vascular Endothelial Growth Factor in Hypoxia

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Serine-arginine-rich (SR) splicing factors are found in the spliceosome that carries out the splicing of exons. Kinases including serine arginine rich protein kinases (SRPKs) activate SR splicing factors. SRPK1 functions in splicing vascular endothelial growth factor (VEGF). The aim of this study was to determine if hypoxic conditions could activate SRPK1/SRPK2 in leukemia cells that splice VEGF isoforms. The results have indicated that hypoxia does not change SRPK1/SRPK2 mRNA levels but protein levels need to be examined. Another possible explanation is that other splicing kinases may be responsible for altering the VEGF 121 levels in leukemia cells. A better understanding of the mechanism of splicing of VEGF could lead to new therapy targeting specific isoforms.

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**Carey Ousley, Junior, Biology, and Matthew Wuensch, Senior, Biology**  
Mentor: David Ward, Ph.D.  
The Impacts of Age and Sex on Behavior in a Territorial Herd of Impalas (Aepyceros melampus)

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We analyzed the behavior of two separate impala (Aepyceros melampus) herds in South Africa. We hypothesized that fawns would spend less time being vigilant than the adults and would spend more time in social interactions and foraging. We also hypothesized that the alpha male would spend a greater portion of his time vigilant than the adult females. The two herds were separated by roughly 2 km, and each herd consisted entirely of mothers and fawns with a single alpha male. Random individuals within the herds were selected and their behaviors were recorded from a distance every 15 seconds. Observations on individuals varied in duration from 5-30 minutes. Date, time of day and habitat were also recorded during each observance. Eleven standard behaviors were observed.

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**Claire Thiele, Senior, Zoology**  
Mentors: Sean Veney, Ph.D., and Charles Austin Leeds, Graduate Student, Case Western Reserve University  
Comparison of Self-Directed and Social Behaviors Amongst a Captive Group of Mandrills (Mandrillus sphinx)

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Mandrills (Mandrillus sphinx) utilize self-directed and social behavior, but the function of these behaviors in this species is poorly understood. In this project, the mandrills of the Cleveland Metroparks Zoo were observed to refine comprehension of the social hierarchies amongst a given captive group. Each self-directed and social behavior of the four individuals on exhibit was identified and compared. Hypotheses formed were: (1) males will exhibit more self-directed behaviors than the females; (2) individuals with higher social rank will exhibit less self-directed behaviors; and (3) there will be a higher rate of self-directed behavior post-conflict. Results found that none of these hypotheses could be supported either due to small population size or misconceptions on complex social animal behaviors.

**Amber Titus, Senior, Biology; Hailee J. Zendlo, Senior, Biology; Hannah M. Bielski, Senior, Chemistry; Lydia A. Heemstra, Graduate Student, Biological Sciences; Chaitanya K. Gavini, Ph.D.; and Colleen M. Novak, Ph.D.**

Mentors: Lydia A. Heemstra, Graduate Student, Biological Sciences; Chaitanya K. Gavini, Ph.D.; and Colleen M. Novak, Ph. D.  
Brain-Induced Muscle Thermogenesis Is Accompanied by Increased Sarcolipin Expression in Skeletal Muscle

Obesity is a major health risk that can lead to numerous complications like heart disease and type II diabetes. In order to promote weight loss, thermogenic mechanisms were examined to burn caloric energy as heat in skeletal muscle, a novel approach. We investigated the expression of the muscle protein, sarcolipin, to determine its potential as a modulator of centrally-induced thermogenesis within skeletal muscle. Quantitative PCR was used to compare gastrocnemius muscle sarcolipin expression between control rats and rats with centrally induced thermogenesis (using melanotan II). There was significantly higher muscle sarcolipin mRNA expression in rats that received melanotan II, implicating muscle sarcolipin as a driver of brain-melanocortin-induced thermogenesis. Activating this thermogenic mechanism in skeletal muscle may be effective in combating obesity.

**Chanelle D. Waligura, Sophomore, Biology**

Mentors: Olena Piontkivska, Ph.D., and Mary Saha Halpin, Graduate Student, Biological Sciences  
Molecular Evolution of Immune Epitopes in Ebola Virus (EBOV, Filoviridae): Insights into Host-Pathogen Interactions

The purpose of this project is to analyze the evolution of the Ebola virus. After the latest outbreak, enough Ebola strains have been sequenced to allow a thorough evolutionary study. Comparing patterns of mutation in regions that have been identified as epitopes to non-epitope protein regions will allow conclusions to be drawn regarding Ebola’s interaction with the human immune system. Ebola could also possibly become more acclimated to humans and transition to a less fatal or chronic disease. If it is a chronic disease in its reservoir host, then it has the ability to become chronic in humans. Thus, I am mapping point mutations in the Ebola virus protein and ascertaining whether or not these mutations are in regions of structural or antigenic importance.

**Allison Zahorec, Senior, Zoology**

Mentor: David Costello, Ph.D.  
Examining the Effects of Road Salt Usage on Pond Snails

The use of salt to increase safety on roads and sidewalks has been shown to negatively affect aquatic macroinvertebrates when dissociated chloride ions enter waterways as run-off. This can have serious consequences for freshwater ecosystems, as macroinvertebrate communities are responsible for critical ecosystem processes. This study identified how road salting affected the salinity of five freshwater ecosystems at Kent State University as well as how pond snail growth and survival were affected by the chloride concentrations of these systems. Ion chromatography and a conductivity meter were used to measure ion concentrations in each ecosystem. Individual snails were introduced to the water samples, and growth and survivorship were monitored for several weeks. Preliminary data indicate that road salting is correlated to increased chloride concentrations within Kent waterways.

**BIOMEDICAL SCIENCES - POSTER**

**Samantha M. Anderson, Senior, Exercise Science; Lisa Stout, Senior, Exercise Science; Jonathan Stavres, Graduate Student, Exercise Physiology; Stephen Fischer, Graduate Student, Exercise Physiology; Amber Finnin, Senior, Exercise Science; Kelly Taylor, Senior, Exercise Science; and John McDaniel, Ph.D.**

Mentors: John McDaniel, Ph.D.; Jonathon Stavres, Graduate Student, Exercise Physiology; and Stephen Fischer, Graduate Student, Exercise Physiology  
The Influence of Eccentric and Concentric Resistance Exercise on Post-Exercise Blood Pressure and Arterial Stiffness

The greater metabolic cost associated with concentric muscle contractions, compared to eccentric muscle contractions, is well known. However, the influence this cost difference has on post exercise hypotension and arterial stiffness is unknown. The purpose of this investigation was to determine changes in blood pressure and arterial stiffness following a session of concentric only and eccentric only resistance exercise. Subjects completed a concentric and eccentric full-body resistance workout. Mean arterial pressure, pulse wave velocity, heart rate and blood lactate were assessed at six different timepoints (pre through 120 minutes of recovery). The data indicates that metabolically demanding concentric exercises result in greater post exercise hypotension and reduced vessel stiffness. These results have exercise prescription implications for those with hypertension or autonomic dysfunction.

**Samantha A. Bailey, Senior, Biology**

Mentors: Kristy Welshhans, Ph.D.; Shruti Jain, Ph.D.; and Leah Kershner, Graduate Student, Biological Sciences  
Generating Induced Neurons from Human Down Syndrome Fibroblasts by Direct Reprogramming

Down syndrome is a complex developmental disorder that results from the triplication of human chromosome 21. Here, we used direct reprogramming to convert human fibroblasts into induced neurons and create a human model of this disorder. We introduced four transcription factors into human Down syndrome fibroblasts and a healthy control via lentiviral mediated gene transfer. We found that Down syndrome fibroblasts can be converted into induced neurons and are in the process of confirming this using neuronal-specific markers. This is a novel discovery, as it was not previously known if Down syndrome fibroblasts could successfully be converted to neurons using direct reprogramming. We will now use this model to gain a better understanding into Down syndrome, as well as insight into treatments for this disorder.



**Bert Crawford, Senior, Biology**  
Mentor: P. Bagavandoss, Ph.D.  
Effect of Phytocannabinoids and Endocannabinoids on Ovarian Cancer Cell Proliferation

The phytocannabinoids tetrahydrocannabinol (Δ9-THC) and cannabidiol (CBD) and the endocannabinoids anandamide (AEA) and 2-arachidonoylglycerol (2-AG) exhibit antiproliferative effect on cancer cells derived from multiple organs, including thyroid, brain, prostate and breast. Therefore, I hypothesized that ovarian cancer cell proliferation will be also inhibited by these cannabinoids. Subconfluent SKOV3 ovarian cancer cells were incubated with the above cannabinoids in serum-free medium for two days. Subsequently, both qualitative

and quantitative methods were used to determine the effects of these compounds on the cells. THC and CBD and R-1 methanandamide (MEA), a metabolically stable analog of anandamide, inhibited cell proliferation and induced rounding and detachment of the cells. 2-AG, however, exhibited no antiproliferative effect. The differential effects of cannabinoids on SKOV3 cell proliferation partly support my hypothesis.

**Richard M. Cukelj, Senior, Biology; Elda Hegmann, Ph.D.; Ernest Freeman, Ph.D.; Jennifer McDonough, Ph.D.; and Robert Clements, Ph.D.**  
Mentors: Elda Hegmann, Ph.D.; Ernest Freeman, Ph.D.; Jennifer McDonough, Ph.D.; and Robert Clements, Ph.D.  
Use of Porous Elastomer Foams to Support Long-Term Three Dimensional Neuronal Cultures

In order to effectively study the interactions that occur between neurons after an extended period of time and spatially in the brain, it is necessary to have reliable, repeatable studies. This is difficult with two-dimensional cell culture techniques. Here we present a platform to study neuronal networks for extended periods in vitro using three-dimensional (3D) elastomer foams. Elastomer foams were constructed with pore sizes ranging from 150µm to

400µm with 40µm secondary pores which allowed human neuroblastoma cells (SH-SY5Y) to adhere and interact with the foam and be sustained for long term studies, over 60 days. Being able to sustain neurons for this long in 3D arrangements allows for a better representation of 3D tissues, making this method applicable for studying neurodegenerative disease states.

**Mitchell Anthony Filka, Senior, Biotechnology**  
Mentor: Min-Ho Kim, Ph.D.  
Antimicrobial Susceptibility Patterns of S. Aureus Biofilms

Staphylococcus Aureus is currently one of the leading causes of infections in diabetic patients and a major cause of chronic wounds. Staphylococcus Aureus is also a common nosocomial infection as it is an opportunistic pathogen that can live in the epidermis of around 30% of the population. The infection can persist easily and become resistant to antibiotics through

the formation of biofilms that can quickly aggregate other Staphylococcus Aureus cells. With need for treatment of these infections on the rise, more research needs to be conducted on the effects of antibiotics on the S. Aureus biofilms.

**Olivia Gilmour, Senior, Exercise Science; Yu Lun Tai, Graduate Student, Exercise Physiology; Erica Marshall, Graduate Student, Exercise Physiology; Alaina Glasgow, Senior, Exercise Science; and J. Derek Kingsley, Ph.D.**  
Mentor: J. Derek Kingsley, Ph.D.  
Autonomic Modulation After an Acute Bout of Bench Press With and Without Blood Flow Restriction

The purpose of the present study was to evaluate autonomic modulation after bench press with and without blood flow restriction (BFR). Sixteen men had their autonomic modulation assessed at rest, 15 (Rec1), and 25 (Rec2) minutes after three different conditions: low-intensity exercise with BFR (LI-BFR), high-intensity exercise (HI), and a control (CON). Autonomic modulation consisted of vagal tone, sympathetic modulation and sympathovagal balance. There was a

significant condition by time interaction for vagal tone such that it was reduced at Rec1 and Rec2 after LI-BFR and HI compared to Rest and CON. There was a main effect of time for sympathovagal balance such that it was increased at Rec1 and Rec2 compared to Rest. These data suggest that LI-BFR and HI similarly alter autonomic modulation.

**Alaina Glasgow, Senior; Exercise Science; Erica Marshall, Graduate Student, Exercise Physiology; Yu Lun Tai, Graduate Student, Exercise Physiology; and J. Derek Kingsley, Ph.D.**  
Mentor: J. Derek Kingsley, Ph. D.  
Acute Resistance Exercise Effects on Autonomic Modulation in Resistance-Trained Men and Women

The purpose of the present study was to evaluate sex-specific responses to an acute bout of resistance exercise (RE) on autonomic modulation. Twenty-three resistance-trained men (n=13) and women (n=10) volunteered for the study. Autonomic modulation was assessed at rest, as well as 15-20 minutes (Rec1) and 25-30 minutes (Rec2) after acute RE. Assessment of autonomic modulation included measures of vagal tone and sympathetic modulation, as

well as sympathovagal balance. The sexes were similar at rest. Compared with rest, sympathetic modulation and sympathovagal balance were augmented at Rec1 and Rec2. Vagal tone was decreased at Rec1 and Rec2 compared to Rest after the acute RE. Our data suggest that acute RE using free weights has a profound impact on autonomic modulation that is similar between the sexes.

**Sierra Glass, Junior, Chemistry; Lori Showalter, Ph.D.; and Gary Koski, Ph.D.**  
Mentors: Gary Koski, Ph.D., and Lori Showalter, Ph.D.  
A New Immunological Treatment of Prostate Cancer Using an Apoptotic Enhancement Therapy Drug, Alisertib

Early breast cancer vaccine therapy may be mediated, in part, through the action of T cell-secreted cytokines Interferon-gamma (IFN-) and Tumor necrosis factor alpha (TNF-). We then sought to determine if three types of prostate cancers (LnCap, PC3, and DU145) showed similar susceptibility to these cytokines and if the addition of the apoptosis-enhancing agent, Alisertib, would further

enhance these effects. There was impaired metabolic activity, fewer viable cells and apoptotic cell death induced by cytokines with Alisertib, as compared to cytokines alone. These studies indicate that vaccines stimulating production of cytokines may be effective for prostate cancer, and are enhanced by Alisertib.

**Kristen Harris, Senior, Biology, and Takhar Kasumov, Ph.D.**  
Mentor: Takhar Kasumov, Ph.D  
HDL Protein Turnover as a Link Between Cardiac Disease and Diabetes

The vascular complications following hyperglycemia and hyperlipidemia are detrimental to individuals that suffer from diabetes mellitus as it accelerates atherosclerosis of the coronary arteries, and the fibrosis of the myocardium. Hyperglycemia causes abnormalities in insulin action and secretion as well as has an effect on biochemical pathways. This leads to alterations of signal transduction pathways and protein function. Changes in the function of lipoprotein

metabolism due to glycation, is one of the main issues increasing the risk for developing atherosclerosis. The purpose of this study is to understand why diabetes contributes to cardiac disease. This study helps to prove the hypothesis that the stability of HDL proteins is smaller and their synthesis rates much faster in hyperglycemic conditions

**Erik Hopkins, Junior, Biology; Spencer R. Andrei, Graduate Student, Biomedical Sciences; Manasi A. Agrawal, Graduate Student, Biomedical Sciences; Monica Ghosh, Graduate Student, Biomedical Sciences; and Derek Damron, Ph.D.**  
Mentors: Derek Damron, Ph.D.; Spencer R. Andrei, Graduate Student, Biomedical Sciences; Manasi A. Agrawal, Graduate Student, Biomedical Sciences; and Monica Ghosh, Graduate Student, Biomedical Sciences  
Delineating a Cardioprotective Pathway for TRP Channel-Induced Nitric Oxide Production in Diabetic Cardiomyocytes

The extent to which TRP channel-induced cardioprotection is modified in the setting of diabetes presents an intriguing clinical interest. We hypothesized that the TRP-induced upregulation of this cardioprotective axis is compromised in diabetes. We found that AITC induced NO production through a pathway dependent upon Akt and eNOS, whereas capsaicin worked through a pathway dependent upon the presence of PKC. Furthermore, activation of TRPA1 and TRPV1

stimulated nitric oxide production in diabetic CMs, but to a significantly lesser degree. Therefore, the extent to which TRPA1 and TRPV1 activation turns on the cardioprotective axis is severely compromised in diabetic CMs. This may, in part, contribute to the significant worsening of cardiac function observed in diabetes following ischemic events in the heart.

**Devanshi M. Mehta, Senior, Biology; Ashley E. Davis, Graduate Student, Biomedical Sciences; Colleen M. Novak, Ph.D.; and Gail Fraizer, Ph.D.**  
Mentors: Ashley Davis, Graduate Student, Biomedical Sciences; Colleen Novak, Ph.D.; and Gail Fraizer, Ph.D.  
Intermittent Fasting Induces Weight Loss Preferentially in Obesity-Prone Rats

Obesity is a leading health problem in the United States. One method to fight obesity is intermittent fasting, where days of limited food access are alternated with days of normal food availability. We employed a rat model of leanness (high-capacity runners) and obesity (low-capacity runners) to test the hypothesis that intermittent fasting will be more effective in obesity-prone rats. Body weight was measured

daily and body composition was analyzed weekly. While all rats lost weight over eight weeks of intermittent fasting, obesity-prone rats lost significantly more fat mass than lean rats. Thus, intermittent fasting decreased loss of lean mass while enhancing loss of fat mass, and was found to be particularly successful in obese rats.

**Alex Mervar, Sophomore, Exercise Science; Alaina Glasgow, Senior, Exercise Science; Erica Marshall, Graduate Student, Exercise Science; Yu Lun Tai, Graduate Student, Exercise Science; and J. Derek Kingsley, Ph. D.**  
Mentor: J. Derek Kingsley, Ph.D.  
Sex-Specific Differences in Pulse Wave Reflection and Arterial Stiffness After Resistance Exercise

Problem:

No studies have evaluated sex-specific vascular responses to an acute bout of resistance exercise (RE). METHODS: Vascular function was assessed at rest and 10 minutes after an acute bout of RE in resistance-trained men (n=14) and women (n=12). A mixed ANOVA was used to analyze the effects of sex (men, women) across condition (acute resistance exercise, control) and time (rest, recovery).

Results:

The sexes had similar values across time and condition. There was no effect of the RE on blood pressures. There were significant condition x time interactions for pulse wave reflection and aortic arterial stiffness such that they were increased post-exercise. CONCLUSIONS: These data suggest that an acute bout of RE significantly alters vascular function similarly for both sexes without altering aortic hemodynamics.

**Cyrus Mirhaidari, Junior, Pre-Medicine/Pre-Osteopathy; Min-Ho Kim, Ph.D.; and Andrew Bayes, Senior, Chemistry**  
Mentor: Min-Ho Kim, Ph.D.  
In Vitro Model of Polymicrobial Biofilm Consisting of Both S. Aureus and P. Aeruginosa

Pseudomonas aeruginosa and Staphylococcus aureus are the two most common causes of chronic wound infections and are frequently found together. Studies suggest that P. aeruginosa and S. aureus infect simultaneously, resulting in worse outcomes than infection by single species bacteria alone. P. aeruginosa has shown to quickly kill S. aureus when the two are grown together in planktonic co-cultures in vitro, making it difficult to develop an appropriate model

closely reflecting polymicrobial infection in human chronic wound. The objective of this study is to establish an in vitro model for polymicrobial biofilms consisting of both S. aureus and P. aeruginosa. This was achieved by innoculating them at different ratios and determining the optimal condition that results in growth of both bacteria.

**Andrew Paliobeis, Senior, Chemistry; John Grizzanti, Graduate Student, Biomedical Sciences; Sara Patrick, Graduate Student, Biomedical Sciences; and Gemma Casadesus, Ph.D.**  
Mentor: Gemma Casadesus, Ph.D.  
Peptide Hormone Amylin Reduces Oxidative Stress Through Improved Mitochondrial Dynamics

Oxidative stress has been shown to be a key pathological feature of neurodegenerative diseases including Alzheimer’s disease (AD). Previous work in our laboratory has demonstrated that administration of the peptide hormone amylin can reduce levels of oxidative stress in mouse and neuronal cell models of AD (APP/PS1 and Neuroscreen-1 cultures). Although it is apparent that amylin has antioxidant activity, its mechanism of action

remains unclear. Because mitochondria are the main contributors to oxidative stress in a cell, they have been a target of our investigation. We have found that amylin treatment regulates mitochondrial dynamics-associated proteins as well as proteins associated with mitochondrial biogenesis. Taken together, our data suggest that some of the effects of amylin on oxidative stress regulation may stem from improving mitochondrial function.

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**Austin D. Parker, Senior, Biology; David F. Barnard, Graduate Student, Biological Sciences; and John D. Johnson, Ph.D.**

Mentors: David F. Barnard, Graduate Student, Biological Sciences, and John D. Johnson, Ph.D.

The Effect of Repeated Stress Exposure on Microglial Phagocytosis

Our lab has previously shown that exposure to chronic stress induces anhedonic behavioral responses in Fischer-344 rats after a four-day chronic mild stress paradigm (Camp et al). To examine the activation state of microglia after this chronic mild stress protocol, microglia were isolated from the hippocampus and placed in culture to measure pro-inflammatory cytokines and phagocytic capacity. Following 4h in culture basal IL-1, TNF-alpha,	and IL-6 protein production were not altered in microglia collected from stressed or control group animals. After LPS stimulation, IL-1 production was attenuated in microglia collected from stressed animals while no changes were observed in the production of TNF-alpha or IL-6. Further studies are required to uncover the effects of stress on microglial phagocytosis.
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**Ryan Pasquino, Senior, Biology; Spencer Andrei, Graduate Student, Biomedical Sciences; Monica Ghosh, Graduate Student, Biomedical Sciences; Manasi Agrawal, Graduate Student, Biomedical Sciences; and Derek Damron, Ph.D.**

Mentor: Derek Damron, Ph. D.

TRPA1 Activation Elicits Post-Translational Modifications of Akt and eNOS in Cardiomyocytes

The extent to which TRPA1 mediates signaling events in cardiac tissue has yet to be fully determined. Based upon investigations completed in other tissue types in the body, we hypothesized that TRPA1 activation will lead to Akt and eNOS activation in CMs. Wild-type CMs treated with TRPA1 agonist, AITC, demonstrated a significant increase in phosphorylated Akt and eNOS compared to the untreated control. These effects were absent in CMs obtained from	TRPA1 null mice. Furthermore, CMs pretreated with LY294002 before AITC addition demonstrated a significant lowering of peNOS-S 1177, whereas pretreatment of CMs with L-NAME had no effect on the AITC-induced increase in pAkt-S 473 levels. We identify a novel signaling cascade in adult mouse cardiomyocytes whereby TRPA1 stimulation elicits Akt phosphorylation followed by eNOS phosphorylation.
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**Madison Shindorf, Senior, Pre-Medicine/Pre Osteopathy; Spencer Andrei, Graduate Student, Biomedical Sciences; Derek Damron, Ph.D.; Manasi Agrawal, Graduate Student, Biomedical Sciences; and Monica Ghosh, Graduate Student, Biomedical Sciences**

Mentors: Derek Damron, Ph.D.; Spencer Andrei, Graduate Student, Biomedical Sciences; Monica Ghosh, Graduate Student, Biomedical Sciences; and Manasi Agrawal, Biomedical Sciences

Analyzing Essential Oils Extracted From Ferula iliensis – Novel TRP Channel Modulators?

We investigated seven different essential oils (EO) extracted from Ferula iliensis that stimulate calcium influx through transient receptor potential channel of the vanilloid subtype 1 (TRPV1)-transfected human embryonic kidney (HEK) cells. The current data show several EO's stimulating calcium influx; however, two compounds, trans-2-nonenal and geranylacetone acted directly through TRPV1. Calcium assay measurements demonstrated that the two EO's induced calcium influxes into TRPV1-transfected HEK cells.	Real-time calcium measurement results were observed where transient increases in intracellular-free calcium concentrations in TRPV1-transfected HEK cells occurred. These effects were diminished in the presence of TRPV1 inhibitor peptide, SB366791, suggesting that trans-2-nonenal and geranylacetone are selective activators of TRPV1. Future investigations will be required to elucidate the intracellular signaling cascades elicited via this TRPV1 stimulation in the heart.
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**Katya Sracic, Senior, Biology; Jeffrey A. Blair, Graduate Student, Biomedical Sciences; Sabina Bhatta, Graduate Student, Biomedical Sciences; and Gemma Casadesus, Ph.D.**

Mentor: Gemma Casadesus, Ph.D.

Luteinizing Hormone and Markers of Neural Plasticity During the Mouse Estrous Cycle

Luteinizing hormone (LH) plays an important role in learning and memory. Previously, our laboratory demonstrated an inverse relationship between blood and brain levels of LH and when normalized post-ovariectomy, both cognition and spine density losses are reversed. To address this reproductive status dependent change, we determined whether normal cyclic fluctuations in LH during the estrous cycle correlate with neuronal markers of neuroplasticity, synaptophysin and spinophilin, in cognition-associated brain	regions. As expected, preliminary data suggest that LH levels fluctuate during the estrous cycle and may correlate with synaptic markers associated with cognitive function. Given that others have found that cognition function fluctuates during the estrous cycle, our data demonstrate that these fluctuations may be at least, in part, dependent on changes in serum and brain LH.
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**Lisa Stout, Senior, Exercise Science; Stephen Fischer, Graduate Student, Exercise Physiology; Samantha M. Anderson, Senior, Exercise Science; Jonathon Stavres, Graduate Student, Exercise Physiology; Amber Finnin, Senior, Exercise Science; Kelly Taylor, Senior, Exercise Science; and John McDaniel, Ph.D.**

**Mentors:** John McDaniel, Ph.D., and Stephen Fischer, Graduate Student, Exercise Physiology  
Metabolic and Cardiovascular Differences Between an Eccentric, Concentric,  
and Traditional Resistance Exercise Training Session

The reduced metabolic cost of isolated eccentric contractions compared to concentric contractions is well-established. However, the net impact of this difference across an entire session of resistance exercise has not been determined. Thus, the purpose of this investigation was to determine the extent to which metabolic and cardiovascular stress varied between training sessions comprised only of eccentric, concentric or traditional resistance exercises. Subjects completed a traditional, concentric and eccentric full-body

resistance workout. Oxygen consumption, respiratory exchange ratio, heart rate, mean arterial pressure, and blood lactate were recorded throughout the exercise sessions. These results indicated that, despite similar mechanical work, the metabolic and cardiovascular demand across resistance training is greater when that session is comprised of only traditional or concentric exercise compared to eccentric exercises.

**Robert W. Woodruff III, Senior, Biology; Leann Ray, Sophomore, Biology;  
John David Glass, Ph.D.; and Alexandra Yaw, Graduate Student, Biomedical Sciences**

Mentors: John David Glass, Ph.D., and Alexandra Yaw, Graduate Student, Biomedical Sciences  
Transgenerational Epigenetic Effect of Cocaine on Circadian Behavior and Cocaine Reward

Cocaine use creates a long-term lengthening of circadian period ( $\tau$ ), possibly underlying health issues of addiction. Additionally, rewarding effects of paternal cocaine are transgenerational. We hypothesize that cocaine's  $\tau$  lengthening effect may also be inherited. Male mice exposed to forced cocaine-water or water were harem-mated with cocaine naïve females. Offspring were phenotyped for drug preference and circadian behaviors. Striatum RNA

was isolated from F1 males and analysed with HiSeq RNA analysis. Lengthening of tau was evident in cocaine sires. Circadian behaviors were not altered in the F1's, but CocSire Males had a decreased preference for cocaine. RNAseq analysis revealed a correlation between genes upregulated in CocSire Males and in the expression CREB and short-term  $\Delta$ FosB. These data reveal a paternal effect on cocaine reward mechanisms.

## ORAL

**Bryson P. Cook, Senior, Integrated Life Sciences; Asaad Al-Adlaan, Graduate Student, Biomedical Sciences; and Fayez F. Safadi, Ph.D.**

Mentor: Fayez F. Safadi, Ph.D.

The Therapeutic Effect of GPNMB/Osteoactivin in a Traumatically Induced Osteoarthritic Mouse Model

Osteoarthritis is a severe joint disease that affects millions of people. At this time, the current treatment for osteoarthritis is total joint reconstruction surgery. GPNMB/Osteoactivin plays a key role in bone remodeling and bone growth. Data from our lab suggested that GPNMB/Osteoactivin is a positive regulator of osteoblastogenesis and a negative regulator of osteoclastogenesis. Furthermore, the role of GPNMB/Osteoactivin in cartilage has not been investigated

before. Based on preliminary studies performed in our lab, we expect cartilage degeneration to be dramatically decreased in response to the therapeutic effects of GPNMB/Osteoactivin. A protective factor against osteoarthritis progression, osteoactivin-injected mice should have remarkably better articular cartilage in comparison to the control group, proving GPNMB/Osteoactivin a promising therapy in lieu of total joint reconstruction.

## COMPUTER SCIENCE/MATHEMATICS - POSTER

**Michael Antonelli, Sophomore, Engineering Technology; James Lundenberger, Junior, Engineering Technology; Tanner Shetler, Sophomore, Engineering Technology; and Alexandre Smart, Senior, Mechanical Engineering Technology**

Mentor: Vladimir Gurau, Ph.D., P.E.

# Design, Fabrication and Demonstration of a Computer Numerically Controlled Rapid Prototyping Machine for Additive Manufacturing, CNC Machining and Laser Cutting

CNC can be applied to a variety of manufacturing processes, including chip forming cutting operations - also called subtractive manufacturing such as milling, turning or drilling, 3D printing - also called additive manufacturing (a form of rapid prototyping), or laser cutting. The common operating feature of all CNC applications is the automated control of the tool (cutter, extruder, laser, etc.) movement relative to the workpiece that is fabricated.

As a consequence, most CNC machines share similar features that include a stage (table) supporting the workpiece that can move along two or three piggybacked axes using drive trains and a tool support that can move along one or more axes. The motion of the tool and workpiece are controlled by stepper motors or servomotors connected to the leadscrews or pulleys through coupling mechanisms.

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**Jacob Boyd, Sophomore, Physics, and Darwin Lee Boyd, Ph.D.**

Mentor: Darwin Lee Boyd, Ph.D.

Autonomous Localization Utilizing Strobing Light Sources

In the NASA Robotic Mining Competition, the goal is to design a robotic system that is capable of completing challenging simulations of tasks an autonomous Martian system would encounter. One of the largest obstacles when designing any autonomous robotic system is localization and orientation. While many systems for localization have been designed and implemented such as GPS and ultrasonic ranging, the conditions of the Martian surface exclude many such

systems and demand a minimalistic system. By utilizing strobing sheets of light and precise timing, it is possible to calculate the position of the robot as a function of time intervals in order to achieve high definition localization and accurate positioning, while being viable for use on the Martian surface.

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**Derek Ellinger, Sophomore, Engineering Technology; James Keyser, Senior, Electrical Engineering Technology; Cody Langenfeld, Junior, Engineering Technolgy; and Robert Menarcheck, Sophomore, Electrical Engineering Technology**

Mentor: Vladimir Gurau, Ph.D., P.E.

Hybrid Unmanned Aircraft System

In the first two phases of the project the HT-PEMFC and the methanol reformer, the octocopter, the gimbal for video acquisition system and the FPV system have been designed and built. In the current phase, we will integrate the flight control system, will calibrate the sensors for stabilized and automated flight control (sensor for global navigation satellite system, electronic compass, altimeter/range finder

and accelerometer / gyroscope), will program flight modes, will integrate the video acquisition and FPV system and will test the system in various flight modes. In a future phase, the HT-PEMFC and the methanol reformer will be integrated to the UAS to secure increased flight autonomy.

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**Donald W. Fincher Jr., Senior, Mathematics**

Mentor: Mahmoud Najafi, Ph.D.

A Study of the Reduction of Excessive Energy Generated by Strong Winds on Power Lines Via a Velocity Damping Controller at the Transmission Tower.

In this research, we are pursuing the robustness of a self-excited vibrational system with negative damping. In practice, this is manifested as conductor galloping of overhead power lines, which is an oscillation of the lines caused by strong winds. Improved transmission tower designs are needed which are capable of combating excessive stresses exerted on the tower by the galloping power lines. Our model of this self-excited system shows that the oscillations can be controlled by adding a boundary

velocity feedback controller at the transmission tower. Using a decomposition method, we show there is a closed form analytical solution which predicts the system can be stabilized under certain conditions. Through this research, power transmission systems that are more reliable and resistant to galloping can be engineered.

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**Paul J. Leyden, Junior, Computer Science**

Mentor: Jonathan Maletic, Ph.D.

Translation of a Text-Based UML Class Diagram Representation Into a Graphical Rendering Language

The goal of the research is to discover and create a means to convert a text representation of UML diagrams (yUML) to the dot language used by Graphviz. Programmers can then easily create and display the design of the software system in an easy-to-follow UML class diagram to enhance the understanding. The research is realized as a software

tool that takes yUML as input and generates the dot representation. The results of this research allow the ability to recover a visual UML class diagram for any given software system. The resulting tool will be an effective and useful addition to the srcML library of tools for programmers to use in understanding large code systems.

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**Samuel Vidovich, Junior, Mathematics, and Robert Kipka, Ph.D.**

Mentor: Robert Kipka, Ph.D.

Simulation and Control of a Tie Fighter

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Simulation and control of rigid bodies such as spacecraft are important aspects of modern aerospace science. Recent decades have seen considerable development of algorithms known as Lie group variational integrators for simulation of the motion of a rigid body. These methods draw both on classical and numerical aspects of mathematics.

In this project we develop software in C++ for a Lie group variational integrator with the goal of simulating a Tie Fighter.

An interesting challenge in this problem is the coordination of the physics, computer science and mathematical aspects of the simulation.

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**Timothy Zee, Senior, Computer Science, and Mehdi Ghayoumi, Graduate Student, Computer Science**

Mentor: Mehdi Ghayoumi, Graduate Student, Computer Science

Comparative Graph Model

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Many facial recognition algorithms use template-based approaches to find features in a facial image that are used for authentication. This works by associating certain features with commonly known features of a human face. This can miss or inaccurately identify features. Comparative Graph Model does not use a template, but instead looks for closeness of features across images, along with how many

times a feature is found, in order to decide what features accurately represent a person's face. This experiment uses Comparative Graph Model along with a perceptron neural network to create feature maps that are used for comparison to other images. Comparative Graph Model offers the advantage of versatility as it allows for features of any type of data, not just human faces.

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**Vlas Zyrianov, Freshman, Computer Science**

Mentors: Jonathan I. Maletic, Ph.D., and Christian Newman, Graduate Student, Computer Science

A Scalable Approach for Lightweight Pointer Analysis

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A lightweight, flow-insensitive pointer analysis tool called srcPtr is presented. The research investigates various methods for pointer analysis to determine which are scalable to large-scale software systems. Pointers are variable that indirectly reference other variables within a source code program. Pointer analysis is a non-trivial activity for determining which variables are being pointed by which pointer and how these indirect references can alter program

behavior. A prototype tool is being constructed. The research involves the implementation of various published algorithmic aspects of pointer analysis and determine, via experimentation, which can be accomplished within the parameters of scalability. Once completed, the approach will be one of the only stand-alone, open-source pointer-analysis tool available.

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# ORAL

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**Ray Thompson, Junior, Engineering Technology**

Mentor: Vladimir Gurau, Ph.D., P.E.

Autonomous Robotic Lawn Mower Guided by Global Navigation Satellite System

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The objective of the proposed research is to investigate, design and demonstrate a robotic lawn mower that uses GNSS and electronic compass as sensors for autopilot. The autopilot will allow the mower to navigate along a predetermined trajectory between waypoints, replacing thus the uneconomical random motion of the prior-art robotic mowers. The autopilot / controller will be based on ArduPilot

platform. The software upload, the configuration of the controller, the calibration of the sensors and the definition of the autopilot trajectory will be achieved using the freeware graphical user interface (GUI) Mission Planner. The trajectory of the mower will be defined in Mission Planner using waypoints on a satellite map of the lawn.

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# COMMUNICATION/ENGLISH/ LANGUAGES - POSTER

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**Alyssa Flower, Senior, Speech Pathology and Audiology**

Mentor: Anna Schmidt, Ph.D.

Insertion of Glottal Stops Before Word-Final Voiceless Stops in English

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Limited research has been conducted on the occurrence of glottal stops, a vocal phenomenon that creates a “creaky voice quality,” in American English (Pierrehumbert, 1995, p. 39). The current study focuses on finding the most facilitative contexts for the insertion of glottal stops for final voiceless stops /p t k/ in English in Northeast Ohio. Data was collected by recording participants reading 24 different sentences containing /p t k/. The targets were

analyzed acoustically and auditorily to determine whether a glottal stop or a different realization was produced. The results suggested that word-final /t/ preceding a fricative or preceding a stressed syllable were the most facilitative contexts for glottal stop insertion. No facilitative contexts were found for /p k/.



**Elizabeth Garlinger, Senior, Communication Studies/Applied Communication**  
Mentor: Nichole L. Egbert, Ph.D.  
Crossing Divides: Health, Communication and End of Life

This literature review explores a series of palliative and hospice care-related studies, which highlight effective practices and potential barriers within cross-cultural communication among patients, families and medical staff. Translating from “medical world” to “real world” is often a major barrier in successful caregiving; however, this complexity is substantially increased due to insufficient

cultural competencies. The specialized analysis will be conducted in regard to the context of cancer or oncology patient care. Theoretical frameworks, evidence-based training, and thematic insights will be the foundation of proposed future research initiatives.

**Samuel Hersh, Junior, English**  
Mentor: Kevin Floyd, Ph.D.  
Manhood and War Making: The Literary Response to the Radicalization of Masculinity for the Purposes of WWI Propaganda

In the years leading up to WWI, masculinity underwent large cultural changes in Western Europe and America. Victorian standards of masculinity fell by 1895 from social control, enabling the new century’s code of manhood to rise—one based on heartiness and physical power. This new sense of manhood was later radicalized by countries for use in their propaganda, luring young men into enlisting. Subsequently, a group of antiwar literature arose to deal with the betrayal

soldiers felt after the war. Through the use of historicism, critical theory, and literary analysis, I argue that America’s Johnny Got His Gun, Germany’s All Quiet on the Western Front, and the war poetry of Britain’s Wilfred Own and Siegfried are all literary pieces of social dissent against martial hypermasculinity.

ORAL

**Abbey Matye, Senior, Theatre Studies and Joe Pine, Senior, American Sign Language**  
Mentor: Larry Nehring, M.S. Ed.  
Signs of Love

Last semester when I started learning American Sign Language, I realized that my school infrequently provides opportunities for D/deaf students on campus to experience or be involved in our productions. After investigating, I learned that the lack of participation stems from a lack of access. The project I have put together as a first step in solving this is Signs of Love: A Cabaret, a concert performed in ASL while simultaneously being sung in English. This project functions as a means of outreach to the Deaf community with the purpose of laying the groundwork

for creating an interactive space where D/deaf individuals can voice their issues and tell their stories. Signs of Love will be performed in such a way that individuals who are D/deaf or Hard of Hearing will be able to experience the production in the same way. Signs of Love will bring students, faculty, and the community together in a way that has not been done before, and will serve as a stepping stone to our art not only being more accessible to a wider audience, but more inclusive to those who want to be involved.

**Lesley Teater, Senior, Video Communication and Design**  
Mentor: Gretchen Rinnert, MGD  
Cursive Camp

Cursive handwriting is no longer a required course in school curricula. For a child’s quickly developing mind, cursive handwriting aids in expanding reading and writing comprehension while also improving cognitive thinking, focus, motor skills and creativity.

Cursive Camp is a two-part learning app. The “practice” section allows children to learn how to form each letter and word at their own pace. The “play” section incorporates

a curriculum to create a more competitive and engaging atmosphere. It is designed to improve children’s memory, recall and letter recognition.

While developing and designing Cursive Camp, I integrated kinesthetic learning techniques to keep the user engaged. I put emphasis on interaction instead of instruction, and created illustrative, animated features to immerse the user in a fun-filled learning experience.

GEOGRAPHY/GEOLOGY - POSTER

**Michael Burkey, Senior, Geology**  
Mentor: David Singer, Ph.D.  
XRD and SEM Analysis of the Thermal Transformation of Iron Oxyhydroxides

Abandoned coalmines around America are still impacting the environment as they discharge contaminated waters into local environments. This is referred to as acid mine drainage (AMD), and it results in highly acidified and heavy metal contaminated waters. Along the beds of the streams running through these areas impacted by coalmining, is a bright orange sediment composed of poorly crystalline iron

oxides. These sediments can be filtered, dried, and baked to form a color agent with varying shades of pigments. Through the analysis of the mineral transformations of these AMD sediments with X-ray powder diffraction and scanning electron microscopy, we can better understand the mineralogical and geochemical transformation of the iron oxides in AMD sediments.

**Konstantinos Kasamias, Junior, Geology**  
Mentor, Chris Rowan, Ph.D.  
Recreation of Newly Discovered Massive Landslide in Utah Using an Analogue Sandbox Model

Recent mapping in SW Utah frontier has revealed one of the largest landslides ever found, extending over 3,400 km2. Although this slide appears to be related uplift associated with volcanic activity in the region 21-22 million years ago, the low angle of slope at which the large mass movement was triggered is difficult to explain. The leading hypothesis is that it is related to low-friction on the slip surface, due to

plate collision, which is in a weak, clay unit. For the purpose of this experiment, an analogue landslide model was created, consisting of a thin 1 inch sand layer on a slowly tilting board, with acetate representing the low-friction slip surface. Further experiments are required to understand the factors that best reproduce Markagunt gravity slide.

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**Matthew Stiller, Senior, Geography, and V. Kelly Turner, Ph.D.**

Mentor: V. Kelly Turner, Ph.D.

Homeowner’s Associations Increasingly Regulate Residential Landscape Ecology in Phoenix, Arizona

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Homeowners Associations (HOAs) exercise power over residential landscapes that have implications for the sustainability of urban ecosystems. This study focuses on the area around the city of Phoenix. Phoenix is in an arid environment and is sensitive to landscape structure. This is differentiated by the use of native landscaping versus the turf grass landscaping that requires more resource inputs.

This study identifies the location of HOAs and examines content of landscaping regulation documents to determine how HOAs influence residential ecology. We found that, HOAs constituted approximately 40 percent of the subdivisions in our sample and frequently regulated pets, landscape structure, water resources and albedo.

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**Samuel B Timko, Senior, Geology, and Kristina M. Falo, Senior, Geology**

Mentor: David B. Hacker, Ph.D.

Geologic and Glacial History of Northeast Ohio: Perspectives From Ohio’s State Parks

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The state parks, nature preserves and metro parks of northeastern Ohio offer unparalleled views and insight into the natural processes that shaped the landscape into what it is today. Every year, millions of visitors come to these parks to view gorges and waterfalls, explore hiking trails, and relax along lakeshores. However, detailed geologic information about these parks is lacking for the public to better understand their ancient history and how they connect to the regional geologic picture. A detailed investigation

was conducted to better understand the geologic history of northeast Ohio as viewed from the geology found in the state parks. The overall goal of this research was to gain an understanding of the geologic processes that shaped northeastern Ohio by studying the unique geology within the state parks, and to eventually present these findings to the park-going public via an educational brochure distributed through the parks.

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# HISTORY/ PHILOSOPHY/ POLITICAL SCIENCE - POSTER

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**Octavious Singleton, Senior, Business; Christina McVay; and Alene Barnes, Ph.D.**

Mentor: Christina McVay

Can the Success of Black Wall Street Be Recreated and Sustained in Black Communities Today?

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In the black community, a dollar leaves every six hours. In comparison to other ethnic groups, the circulation of revenue in the black community is the shortest. The ability to retain money within the community will give blacks the power to enhance their living conditions, without outside

help. Nowadays, you see vacant buildings, roads filled with crater size potholes, businesses outsourced to non-blacks, and unity avoided. This research will evaluate the factors hindering another successful community like Black Wall Street from resurrecting.

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# HISTORY/ PHILOSOPHY/ POLITICAL SCIENCE - ORAL

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**Elena Clark, Senior, Fashion Merchandising, and Gargi Bhaduri, Ph.D.**

Mentor: Gargi Bhaduri, Ph.D.

A Call for Responsible Labor Practices in the Apparel Industry Through Improved Standardized Labor Policies

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Knowledge of product origin is an essential element of consumer social responsibility, as the apparel industry is often condemned for unfair labor practices. This study investigates labor laws affecting apparel workers during the manufacturing of US imported apparel. The research question is: What are differences and similarities between U.S. labor laws, and those of its major exporter countries

as well as related international laws? A content analysis investigates laws and regulations, indicating labor laws vary significantly across the countries and international platforms, affecting labor workers differently. A consistent labor standard should be further established on a national and global scale.

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**Nicole Hamsher, Junior, English**

Mentor: M. Karen Powers, Ph.D.

Colossus, Raise Your Lamp: Reclaiming Our Diversity Through Immigration

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Each American is part of a unique tradition that invites people from all parts of the globe to come here, seek their fortune, find happiness and give their families a fresh start: essentially, embody the American Dream. Those who dare to come here today through legal channels face an overcomplicated, expensive process that takes years to navigate. Many take the only option they have: entering the country illegally.

As immigration takes center stage, the political climate surrounding it has become outright hostile with the election of President Trump. We need to find a solution that allows those here to become part of the culture they help build and support. Finding a solution that provides opportunities for those seeking them, while maintaining possibilities for the current citizenry is imperative to our country’s future.

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**Kathleen Moorman, Senior, Political Science**

Mentor: Julie Mazzei, Ph.D.

“Draw a President”: An Analysis of Children’s Images of the Presidency and How They Affect Women in Politics

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The lack of female representation in the political sphere is an undeniable issue of concern in America, and may be partially traced to established stereotypes about American politicians. In this study, 73 children in second grade were asked to “draw a picture of the president in 20 years,” and the respondent’s race and gender were noted. Using the data from these images, we are able to create an image of the stereotypical

American president, and establish what differences exist between male and female perceptions of the presidency. The differences and overarching stereotypes found by this study could provide insight into why girls are so much less likely to go into politics, and hopefully give us a way to remedy that wrong.

**Padraigin O’Flynn, Senior, Economics**

Mentor: Curtis Lockwood Reynolds, Ph.D.

Property Tax Salience: An Analysis of Voting Patterns on Ohio School Levies

Do voters truly understand the types of property taxes that appear on the ballot in local elections, and are they fully aware of the effects of such taxes in order to vote in their own self-interest? This question is fundamentally important to local elections and the improvement of our local school districts, as much of the income acquired from property taxes goes towards the funding of school districts. Thus far,

initial regression analyses have been completed using SAS that have allowed us to come to the preliminary conclusion that people are unaware of types of levies and the general setup of the property tax collection and distribution system. These conclusions have formed a solid foundation for future research that delves deeper into this topic.

**PHYSICS/CHEMISTRY/  
LIQUID CRYSTALS - POSTER**

**Andre Antoine, Junior, Physics, and Bjorn Lussem, Ph.D.**

Mentors: Bjorn Lussem, Ph.D., and Chang-min Keum, Ph.D.

The Effects of Light Scattering in OLED Efficiency

OLED outcoupling efficiency is limited by several factors. One major factor is the limitation caused by internal reflection of light with the interface between organic layers including the anode and glass substrate. Here, we approach this problem by adding a fairly exotic material to the OLED setup, which strongly scatters light. We expect

the scattering to weaken total internal reflection and increase outcoupling efficiency. Through measurements, we compare the out coupling efficiency of the control OLEDs and the OLEDs with the scattering layer. Finally, we analyze the potential for increased out coupling efficiency and, later, industrial application.

**Jonathan W. Boyd, Senior, Physics, and Roberto Uribe-Rendon, Ph.D.**

Mentor: Roberto Uribe-Rendon, Ph.D.

Reduction of Graphene Oxide Via Electron Beam Irradiation Characterized by Structural and Resistivity Changes

Graphene is a material that promises much technologic advancement, from more efficient solar cells to higher capacity batteries. The difficulty of synthesizing graphene currently limits its use. Graphene oxide is similar to graphene except oxygen-containing functional groups are attached to the carbon lattice. Graphene oxide is easier to synthesize than graphene; however, the functional groups reduce the electrical conductivity of the material. This process of removing oxygen groups is known as reduction and

the final product of their removal from graphene oxide is aptly called reduced graphene oxide. We aim at investigating if radiation from an electron beam accelerator could reduce graphene oxide. The amount of reduction is characterized with infrared spectroscopy and four-point probe resistivity measurements.

**Jacob Brewer, Senior, Biochemistry; Robert J. Twieg, Ph.D.; Zhe Li, Ph.D.; Brett D. Ellman, Ph.D.; Mitchell Powers, Graduate Student, Physics; Lewis Sharpnack, Graduate Student, Physics; and Satyen Kumar, Ph.D.**

Mentor: Robert Twieg, Ph.D.

No-Tail Discotic Liquid Crystals

Liquid crystals (LC) are often oversimplified as requiring a “hard” ring/core component and a “soft” acyclic/tail. The technical goal of this project is to design, prepare and characterize simple aromatic molecules with no tails that display discotic/columnar behavior. Such materials are potentially important as organic semiconductor materials.

We have prepared triphenylene compounds with careful control of fluorination and other substitution. These molecules were prepared using organometallic

C-C bond forming reactions and a photochemical photocyclodehydrofluorination reaction; developed specifically for the controlled preparation of selectively fluorinated polynuclear aromatics.

This approach has led to the discovery of a growing class of tail-free triphenylene discotic materials. We are in the process of systematically modifying the structure of the triphenylenes in order to understand the requirements for discotic behavior.

**Dakota Bunner, Senior, Aeronautics**

Mentor: D. Blake Stringer, Ph.D.

Airfoil Three-Six-Zero: Wind Tunnel Experimentation at Low Reynolds Numbers for Vertical Axis Wind Turbine Applications

In today’s energy market, vertical-axis wind turbines have limited use when compared to horizontal-axis turbines. However, new designs are emerging that might provide significant power generation for lower-wind applications. One configuration is of spherical design, in which the type of airfoil used is of importance. This research chronicles the wind tunnel experimentation of the s1210 airfoil. The objectives were to formalize a methodology to quantify

the performance of the s1210 through 360 degrees’ angle-of-attack, and characterize any effects of wind-tunnel interference. Aerodynamic performance data were collected for full rotation of the airfoil. Wind tunnel interference was accounted for using correction methods. Using coordinate transformations, the driving force magnitude was determined and shows the s1210 produces a driving force in three of four quadrants of rotation.

**Mark Campbell, Senior, Biochemistry**

Mentors: Paul Sampson, Ph.D., and Alex Seed, Ph.D.

Synthesis of New Photoactivatable (3-Hydroxy-2-naphthyl)methyl (HNM)-Based Nitroxyl (HNO) Donors

Nitroxyl (HNO) is a biologically relevant molecule with considerable clinical promise for the treatment of heart failure. To aid in biological and chemical studies, various nitroxyl donors (molecules that degrade to release HNO) have been synthesized. Our group’s focus is on the synthesis of nitroxyl donors that rapidly release HNO under physiological conditions through photoactivation. First generation donors

(1) released HNO but also experienced a side reaction. In this study, we are probing the impact of a methyl substituent at C\* (2) on these competing processes. Difficulty in the synthesis of alkoxylamine intermediate 3 has led to studies of variant Mitsunobu reactions. This poster will present progress made to date on the Mitsunobu step leading to 3 and its elaboration to the final target 2.



<b>Ethan H. Comfort, Senior, Chemistry, and Jonathan Tietz, University of Illinois, Urbana-Champaign</b> Mentor: Paul Sampson, Ph.D. Synthesis of Thieno[3,2-b]thiophene-based Liquid Crystals	
One challenge in the development of ferroelectric liquid crystal (LC) display materials is the presence of defects attributed to smectic layer contraction on cooling from the smectic A phase to the smectic C phase during alignment. Though some materials exist which do not exhibit such defects (DeVries materials), an understanding of which structural features favor such properties is not yet available.	Our group has discovered several LC mesogens containing sulfur-based moieties that do not possess these problematic defects. In this study, our goal is to synthesize several structural variants of a LC family containing a thieno[3,2-b]thiophene ring within the LC core (e.g. 1) to determine how structural changes impact mesogenic behavior.

<b>Katherine Marie Greskovich, Sophomore, Biochemistry, and Vincent Serapiglia, Junior, Integrated Life Sciences</b> Mentor: Songping D. Huang, Ph.D. Investigation of Novel Application of Gallium Cysteinate Nanoparticles in Antibiotic-Resistant Bacterial Therapies	
Infections caused by antibiotic-resistant strains of bacteria have been on the rise in recent years due to overuse of conventional antibiotic drugs. Development of novel ways to combat these bacteria is essential to ensure the continuing health of the world population. We will test a gallium cysteinate nanoparticle for its ability to kill these antibiotic-	resistant strains of bacteria, utilizing gallium's already-studied antibiotic properties due to its similarities to the essential metal iron. We will also investigate the possibility of utilizing a copper-bound gallium cysteinate nanoparticle in these applications.

<b>Caitlin Hawkins, Senior, Biochemistry</b> Mentor: Sanjaya Abeysirigunawardena, Ph.D. Development of FRET-Based Assay to Observe Binding of RNA Modification Enzyme RsmG to 16S Ribosomal RNA	
Ribosomes are the molecular machines that carry out protein biosynthesis in all living organisms. They are composed of three different ribosomal RNAs and more than 50 ribosomal proteins. My project in Abey lab is to investigate how RNA modification enzyme RsmG influences ribosomal proteins binding to 16S ribosomal RNA. To achieve this goal, I have developed an assay to monitor binding of RsmG to	ribosomal RNA, which will allow us to determine the binding affinity of RsmG to RNA and thus calculate thermodynamic cooperativity between RsmG enzyme and ribosomal proteins. Our findings give us more insight to how modification enzymes modulate the hierarchy of protein addition during ribosome biogenesis.

<b>Destiny A. Kaznoch, Senior, Chemistry, and Sanjaya Abeysirigunawardena, Ph.D.</b> Mentor: Sanjaya Abeysirigunawardena, Ph.D. Investigation of the Dynamics of the Helix 18 Pseudoknot in 16S rRNA	
Nucleotide modifications are present in various RNAs including functionally important regions of ribosomal RNA. A pseudouridine ( ) and 7-methyl guanine (m7G) modified nucleotides are present in 16S rRNA. This research focuses on understanding the structural and thermodynamic effects of these two modifications and the pseudoknot as observed in the Helix 18 region of 16S rRNA and how these modified nucleotides influence folding dynamics. Conformational	changes were detected using Foster Resonance Energy Transfer (FRET) experiments. The Helix 18 model RNA was constructed using two synthetic, fluorescently labeled RNA oligos. The electromobility gel shift assay showed the equilibrium dissociation constant between the two oligos was 5nM and the FRET signal increased with an increase in Mg2+ concentration.

<b>Seth Miller, Sophomore, Engineering Technology</b> Mentor: Vladimir Gurau, Ph.D. Hybrid Unmanned Aircraft System With Long-Flight Autonomy	
1. Introduction Unmanned Aircraft Systems (UASs) are systems comprising of an unmanned aircraft vehicle (UAV), its payloads, the control station, its support subsystem and its communication subsystem [1]. UASs can be used for cargo / package delivery or as sensor platforms for data acquisition [2] such as aerial mapping, aerial surveying, precision agriculture (crop health or crop damage assessment), natural resource management (wildlife census, impact of human activities on wildlife), inspection of industrial and civil infrastructure, aerial filming and photography, news reporting or intelligence, surveillance, reconnaissance and emergency response.	2. Objectives The current project represents Phase 3 of a four-phase endeavor at Kent State University at Tuscarawas. Its general objectives are to design, build and test an UAS consisting of an octocopter as UAV (Figure 1) for data acquisition and capable of operating under manual control, stabilized control and automated control (autopilot). The system has video acquisition and recording subsystem consisting of an SJ 4000 action camera mounted on a 3-axes gimbal for image stabilization (Figure 2) and first person view (FPV) subsystem consisting of an HD camera, 5.8 GHz video transmitter and receiver modules and on-screen display (OSD) for transmitting telemetry data (Figure 3).

<b>Brandon T. Whitecotton, Senior, Biological Sciences; Keshav GC, Graduate Student, Chemistry; and Sanjaya Abeysirigunawardena, Ph.D.</b> Mentors: Keshav GC, Graduate Student, Chemistry and Sanjaya Abeysirigunawardena, Ph.D. RsmC Stabilizes the Formation of Helix 34 of 16S Ribosomal RNA	
Accurate biogenesis of the ribosome is critical for cell survival. Previous studies on ribosomal assembly suggest that post-transcriptional modification steps are important for accurate biogenesis of ribosome. Protein RsmC is an enzyme that post-transcriptionally methylates G1207 of 16S ribosomal RNA. Previous studies suggest that RsmC may assist in annealing of two RNA strands. To test this hypothesis, I carried out Fluorescence-based	native gel electrophoresis experiments to determine RNA annealing thermodynamics in the presence and absence of protein RsmC under various magnesium ion concentrations. My data suggest that RsmC stabilize RNA duplex at 4 mM Magnesium ion concentration. This result shows that RsmC enzyme will prevent misfolding of ribosomal RNA during ribosome biogenesis.

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# NURSING

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**Alyssa Gibson, Junior, Nursing**

Mentor: Kimberly Cleveland, Ph.D., J.D., M.S.N., RN, C-MBC

Reiki: Regulatory Status and Impact on Nursing Practice

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Complimentary therapies have been shown to reduce stress in numerous patient areas. Many times, nurses are responsible in advocating for the provision of these therapies. Research has established benefits of reiki but there is no national or statewide licensure or regulatory policies for reiki. Due to the lack of regulation, patient safety can be compromised. A literature review was

done to identify the legal responsibilities of nurses involved in this dilemma. The literature review showed positive outcomes for patients receiving reiki therapy, but no regulation. The goal of this research is to display the need for policy regulating reiki. Reiki therapy should be available for patients who can benefit from its healing potential, but in a safe and regulated way.

**David Hartsook, Junior, Nursing; Emily Stevens, Junior, Nursing; and Barbara Drew, Ph.D.**

Mentor: Barbara Drew, Ph.D.

Trends in Geographic Areas With High Suicide Rates of College-Aged Adults

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Suicide is the second leading cause of death for college-aged adults with nearly 3,900 deaths in 2010 (CDC, 2015). With this in mind, suicide can be prevented when communities are provided with adequate support systems. Our research is focused on describing counties with crude rates of 20 or more suicides per 100,000 residents aged 18-24 in an effort to find trends in data such as population density, median household

income, and ethnic/racial mix and to compare these counties with those which have lower suicide rates. Understanding the environmental context associated with suicide risk will facilitate communication among healthcare providers, patients and their families and contribute to prevention efforts.

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**Kaitlyn Kauppila, Sophomore, Nursing; Mara N. Deiwert, Sophomore, Nursing; and Lauren Fassnacht, Sophomore, Nursing**

Mentor: Pam Stephenson, Ph.D.

An Atheistic Perspective of End-of-Life Uncertainty: A Case Study Approach

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Problem and Significance:  
Facing death brings about many unique questions, concerns and uncertainties; many of which are spiritual in nature. Nurses are expected to provide spiritual care to all patients, including those with nonreligious or atheistic beliefs but research is limited.

Method:  
This research used existing qualitative data about end-of-life uncertainties during which one participant described having atheistic beliefs. This analysis will utilize case study

methods to conduct an in-depth analysis of one atheistic account of end-of-life uncertainties. Data will be triangulated with other research and popular culture.

Results:  
Findings will describe how one participant with an atheistic viewpoint experienced uncertainty related to his approaching death.

Conclusion:  
This analysis helps to explain atheistic beliefs so nurses can provide spiritual care to a broader patient population.

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**Matthew Mysliwiec, Senior, Nursing, and Timothy Meyers, Ph.D.**

Mentor: Timothy Meyers, Ph.D.

Organ Donation Simulation Education for Undergraduate Baccalaureate Nursing Students

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With a well-documented organ donor shortage, organ donation has become a major public health issue. It was discovered that nursing students demonstrated a knowledge deficit related to organ donation. It is hypothesized that utilizing teaching modalities (i.e., simulation experience) will increase knowledge, skills, and attitudes related to organ donation in baccalaureate nursing students. Participants will

complete the Nursing Student Organ Donation Questionnaire 2016 before and after being randomly assigned to one of two groups: 1) simulation, and 2) no intervention. The survey will be administered in the Spring 2017 semester. The goal of the simulation experience is to increase overall knowledge to better prepare nurses when they experience organ donation in their nursing career.

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**Melissa E. North, Senior, Nursing, and Timothy Meyers, Ph.D.**

Mentor: Timothy Meyers, Ph.D.

Increasing Education on Organ Donation for Baccalaureate Nursing Students: A QSEN Approach

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There is currently a lack of information available on organ donation that is relevant to nursing students. The focus of this descriptive study is to test the hypothesis that including additional material through a blackboard course will increase knowledge, skills, and attitudes of nursing students to better prepare the students for the delicacy of organ donation. As

organ donation is becoming an ever-increasing healthcare priority, education that begins in nursing school is crucial. By exposing students to the delicate situations related to organ donation, the students will be more comfortable when facing this process in their nursing career.

**Jessica Paul, Junior, Nursing, and Kelli Janus, Junior, Nursing**  
Mentor: Patricia E. Vermeersch, Ph.D.  
Perceived Barriers to Electronic Medical Record Use in Post-Acute, Long-term Care

Electronic medical record (EMR), although well-used and documented in acute care settings, has moved into long-term settings such as post-acute care. A local facility has several years of experience with its EMR, but there have been difficulties in the full implementation and utilization of the EMR by its staff. The EMR is used to record patient information; therefore, it is an integral part of nursing

care. The literature has identified several barriers to the utilization and implementation with EMR in the hospital or acute-care setting, but is less well studied in post-acute care. The purpose of this research was to identify barriers in the post-acute, long-term care use of EMR, and was then used to develop a tool.

**Micah Ward, Junior, Nursing**  
Mentor: Yvonne Smith, Ph.D.  
Nurses on Boards Research

Nurses are extremely underrepresented on decision-making boards both in and out of hospitals. This project examined research on Nurses on Boards to determine more information as to why nurses are not present on these boards and how nurses can be more active when seeking opportunities to serve on boards. Details were synthesized into a research

matrix that is organized by the usefulness of each article. Based on this process, findings from the literature support that nurses need to advocate for themselves and seek opportunities to serve on boards, since they already have the decision-making and compassionate skills that make them well-suited for these positions.

# PSYCHOLOGY - POSTER

**Peyton Adams, Junior, Human Development and Family Studies; Alexa Bruderly, Junior, Psychological Sciences; Cody Geer, Senior, Psychological Sciences; Tawnia Jenkins, Senior, Human Services Technologies; Mackenzie Kiko, Senior, Psychological Services; Marcus Mick, Senior, Criminal Justice; Katherine Seidner, Senior, Human Development and Family Studies; Autumn Van Fossan, Senior, Human Development and Family Studies**  
Mentor: Rachael Blasiman, Ph.D.  
The Role of Executive Functions in Spoken Word

Executive functions are basic processes that underlie thought and behavior. Three executive functions - updating, shifting and task switching - have been identified. Past research has examined these functions in relationship to reading comprehension, mathematical understanding, intelligence and learning disability. The current study aims to extend this research to spoken word. Participants

completed measures of executive function, recited a poem and provided a short speech. Audio recordings were analyzed for irregularities such as pauses, errors and filler words. The results are discussed in terms of spontaneous dialogue, prepared speech, and the role of individual executive functions in spoken language.

**Nabria Beasley, Senior, Psychological Sciences**  
Mentor: Kelly Cichy, Ph.D.  
Gender Differences Between Mothers and Fathers in Exposure and Reactivity to Parenting Stressors

This study examined gender differences between mothers and fathers in exposure to parenting stressors. This study also examines reactivity to parenting stressors by examining associations between parents' parenting stressors and their health and wellbeing. Participants included 1,118 individuals who identified as parents (N=1,118 from the Midlife in the United States Survey (MIDUS II) and the National Study of Daily Experiences

(NSDE II)). Participants' ages ranged from 33 to 84 years. Respondents self-reported their physical health, mental/emotional health, marital status and number of children. For a series of eight days, respondents also reported on the stressors they experienced that involved their children (i.e., parenting stressors), as well as their negative effect and physical health symptoms.

**Emily Berndt, Senior, Psychological Sciences**  
Mentor: Rachael Blasiman, Ph.D.  
The Effect of Stress on Physical Health, Emotional Well-Being, and Cognition

This study aims to examine the physiological, emotional, and psychological effects of stress on the human body. The goal I have for this study is to find how stress affects people, particularly college students, in order to gain a better understanding of how to help people better manage their stress. The study is a quantitative, quasi-experimental, correlational design and will focus on students within a

university setting. I am using a variety of surveys to see how stress affects participants' lives and if there are any correlations between stress and wellbeing. I hypothesize that stress will show a negative correlation with emotional health and cognitive wellbeing, and a positive correlation to physiological symptom reporting. This study has been approved and I am currently collecting data.

**Brittany Blier, Senior, Psychological Sciences; Logan Kochendorfer, Graduate Student, Experimental Psychology; Jennifer R. Wagner, B.S.; and Kathryn Kerns, Ph.D.**  
Mentor: Kathryn Kerns, Ph.D.  
Parental Emotion Socialization in Late Childhood and Early Adolescence

The way parents socialize, or respond to, their children's negative emotional expressions provide an important context for the development of adequate coping skills in childhood. Six traditional approaches have been highlighted as response strategies used by parents. However, these strategies have only been examined with closed-response questionnaires filled out by parents of young children. The present study, which used an open-ended approach,

expands on previous research by testing the six traditional approaches in parents with older children (ages 9-14 years), and by exploring whether parents use new emotion socialization strategies in different situations. Results suggest that parents continue to use the six traditional approaches with older children, while also using three new approaches, and the use of different strategies depended on context.



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**Marie Childers, Junior, Psychological Sciences; Michael A. Eskenazi, Ph.D.;**  
**Angela C. Jones, Ph.D.; Ashley N. Abraham, Graduate Student, Psychological Sciences;**  
**and Jocelyn R. Folk, Ph.D.**  
Mentor: Jocelyn Folk, Ph.D.  
Spelling Ability Affects Homophone Processing During Reading: Frog and Towed Are Friends

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Individual differences in spelling ability may lead to differential orthographic processing during reading (Andrews & Low, 2013), and may contribute to null effects when individual differences are not considered (Andrews & Hersch, 2010). We hypothesized that differences in spelling ability may contribute to phonological processing during reading. Participants made lexical decisions on words (e.g., FROG) that were briefly primed by a semantic associate (e.g., TOAD) or a homophone of the associate (e.g., TOWED). Importantly, individual difference results indicated that spelling ability influenced priming. Low spelling ability, regardless of reading ability, led to priming from both prime types. High spelling ability, regardless of reading ability, only led to priming from the semantic associate. Thus, spelling ability contributes to differences in phonologically mediated, semantic activation during reading.

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**Courtney Costanzo, Junior, Psychological Sciences; Maeson S. Latsko, Graduate Student, Experiential Psychology; and Aaron Jasnow, Ph.D.**  
Mentors: Aaron Jasnow, Ph. D. and Maeson Latsko, Graduate Student, Experiential Psychology  
Corticosterone Ameliorates the Adult Social Behavior Deficits Caused by Peripubertal Social Defeat

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Our lab exposes peripubertal (P30) mice to repeated aggressive social defeats, followed by tests for social interaction. When mice are tested 24 hours after defeat, all defeated mice display interaction. When the same mice are tested in adulthood (P62), some display social avoidance, whereas others display normal social interaction. Corticosterone over night prior to social interaction testing at P32 ameliorates the deficits in adult social behavior caused by peripubertal social defeat. Pharmacologically blocking glucocorticoid receptors blocks enhanced social behavior produced by corticosterone administration. Mice administered corticosterone, but not subjected to a social interaction test at P32, do not display increased social behavior as adults. These data suggest that corticosterone interacts with re-exposure to ameliorate the social behavior deficits caused by peripubertal social defeat.

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**Ya’el Courtney, Junior, Biochemistry**  
Mentors: Todd Braver, Ph.D., and Debbie Yee, Graduate Student  
Reward vs. Punishment: An fMRI Analysis Approach to Identifying the Neural Substrates of Motivation and Cognitive Control

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Every day, humans face the complex cost-benefit analysis of integrating different incentives to pursue behavioral goals. Impairments in cognitive control (and particularly an abnormal response to motivation) underlie disorders such as schizophrenia, anxiety, depression and addictions. As such, it is important to illustrate how differing motivational cues are processed in healthy humans. Specifically, whether rewards and punishments utilize the same neural substrates to yield motivational effects was studied. In the current study, participants performed a cued-task switching paradigm during two fMRI scanning sessions. Reward and punishment incentives resulted in comparable behavioral task performance, but our analysis revealed several regions of interest that appear to be distinct between the conditions. This suggests the exciting result that reward and punishment motivations are processed via different neural substrates.

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**Catelyn Dorsey, Junior Psychological Sciences; Benjamin Siglow, Senior, Psychological Sciences; Delilah Ellzey, Graduate Student, Clinical Psychology; Kallie Petitti, Graduate Student, School Psychology; Martale Davis, Graduate Student, Psychological Sciences; Elizabeth Jean, Graduate Student, Psychological Sciences; Robert Stadulis, Ph.D.; and Angela Neal-Barnett, Ph.D.**  
Mentors: Deliah Elizey, Graduate Student, Clinical Psychology; Benjamin Siglow, Senior, Psychology; Kallie Petitti, Graduate Student, School Psychology; Angela Neal-Barnett, Ph.D.; and Elizabeth Jean, Graduate Student, Psychological Sciences  
Feasibility and Effectiveness of a Musical Cognitive Restructuring App for Black Middle School Girls

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Mobile applications have become useful tools in behavioral health interventions. While several applications have been developed for adults, apps for youth and minority populations are sorely lacking. This study examined the feasibility and effectiveness of a musical cognitive restructuring app for managing negative thoughts. We hypothesized that youth would like the idea of an app, find it helpful to reduce anxiety and use it daily. Eighty-eight girls were enrolled in the Sisters United Now (S.U.N.) anxiety intervention. During the intervention, girls were introduced and taught to use the SUN app. Quantitative data indicated girls were excited to use the app, enjoyed recording their song, and believed the app would help with anxiety. Both quantitative and qualitative results indicated the initial app was feasible.

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**Julia Fouty, Senior, Psychological Sciences; Samantha Ortiz, Graduate Student, Psychological Sciences; Maeson S. Latsko, Graduate Student, Experimental Psychology; and Aaron Jasnow, Ph.D.**  
Mentor: Aaron Jasnow, Ph.D.  
A Neural Circuit Controlling Fear Generalization

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A characteristic of anxiety disorders is the generalization of fear to neutral stimuli. Immediately after context fear-conditioning, mice display higher levels of freezing in the training context compared to a novel context; over time, mice generalize their fear to novel contexts. Using chemogenetics, we investigated the fear generalization circuit by disrupting projections from either the ventral hippocampus (vHPC) or the anterior cingulate cortex (ACC) to the basolateral amygdala (BLA). Inhibiting projections from the vHPC to the BLA reduced freezing in the novel context; whereas, inhibiting projections from the ACC to the BLA completely eliminated freezing in the novel context. These results suggest a fear generalization circuit and are helpful in understanding the neural processes involved in generalized anxiety disorders.

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**Stephanie Gotti, Senior, Psychological Sciences, and Anna DiBlasio, Senior, Psychological Sciences**

Mentor: Patricia Tomich, Ph.D.

Are Males and Females Similar or Different in Stressful Situations?

This study assesses gender differences in reports of perceived stress and personal growth in a stressful experimental situation. Participants were 144 young adults (mean age = 25.01). Females reported significantly more stress, but not more growth, than did males. Gender differences also emerged when analyzing relations of

stress with physical and mental health. However, analyses examining relations of personal growth with physical and mental health indicated males and females are more similar than different.

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**Payton L. Hagerdorn, Senior, Psychological Sciences; Jordan M. Adkins, Graduate Student, Psychological Sciences; and Aaron M. Jasnow, Ph.D.**

Mentors: Aaron Jasnow, Ph.D., and Jordan M. Adkins, Graduate Student, Psychological Sciences

The Role of Glutamate Receptors and the Sex-Dependent Influence of Estradiol on Fear Generalization in Rats

Women are more likely than men to suffer from anxiety disorders. A characteristic of many anxiety disorders is generalization of fear responses, resulting in expression of fear to neutral stimuli. We've shown that estradiol induces fear generalization in female rats, but reduces it in males. Here, we examined the role of glutamate receptors in estradiol induced-generalization in female rats and uncovered potential brain regions associated

with reduced generalization in males. We found that glutamate receptors are necessary for estradiol induced fear generalization, and that the dorsal CA1 region of the hippocampus, but not the bed nucleus stria terminals play a role in reduced generalization in males. Understanding the sex-dependent influences of estradiol on generalization will allow for improved, sex-specific, treatments for many anxiety disorders.

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**Nathaniel X. Hasso, Senior, Psychological Sciences; Megan E. Miller-Cahill, Graduate Student, Psychological Sciences; Jessica L. Sharp, Graduate Student, Psychological Sciences; and Stephen B. Fountain, Ph.D.**

Mentors: Megan E. Miller-Cahill, Graduate Student, Psychological Sciences; Jessica L. Sharp,

Graduate Student, Psychological Sciences; and Stephen B. Fountain, Ph.D.

Serial Pattern Extrapolation Is Spared During a Cholinergic Challenge in Rats

Rats learned a rule-based serial pattern that consisted of seven chunks (123-234-345-456-567-678-781). After learning to a high criterion on all elements of the pattern, rats were given injections of scopolamine 30 minutes before testing on a transfer pattern consisting of the training pattern with an added eighth chunk that was either consistent with pattern structure (chunk "812") or contained a terminal element that violated pattern structure (chunk "818"). Under scopolamine, rats in both groups extrapolated

known pattern structure, producing rule-consistent responses on the terminal element of both added chunks. In the case of the chunk containing the violation element, when confronted with a new trial requiring a response inconsistent with already-learned pattern structure, rats attempted to apply the well-learned rule.

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**Shannon Hickey, Senior, Psychological Sciences; Jessica L. Sharp, Graduate Student, Psychological Sciences; Megan E. Miller, Graduate Student, Psychological Sciences; and Stephen B. Fountain, Ph.D.**

Mentors: Jessica L. Sharp, Graduate Student, Psychological Sciences; Megan E. Miller,

Graduate Student, Psychological Sciences; and Stephen B. Fountain, Ph.D.

Serial Pattern Retention in Male and Female Rats: Forgetting Curves for an Element That Violates Pattern Structure

We examined serial pattern retention in rats focusing on retention for a single pattern element that violated pattern structure. Violation elements were targeted because they are typically unusually difficult to learn, contrasting with rule-learning in the structured pattern. Rats learned to nose-poke in the pattern, 123-234-345-456-567-678-781-818, where the final "violation element" is inconsistent with pattern structure. Rats were trained twice to an 85 percent correct criterion on the violation element prior to

testing after four-week and two-week retention intervals, respectively. After each retention interval, rats received a one-day, 10-pattern retention test on the same pattern. Results indicated that rats had approximately 57 percent retention after two weeks and 28 percent retention after four weeks. The results indicate that serial-pattern memory can be assessed by characterizing forgetting curves.

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**Stephanie Hilliard, Junior, Speech Pathology and Audiology, and Amanda Zamary, Graduate Student, Psychological Sciences**

Mentor: Amanda Zamary, Graduate Student, Psychological Sciences

Provided Examples Directly Benefit Novel Concept Application

Students learn declarative concepts (e.g., positive reinforcement) in many courses. Previous research shows that providing students with examples enhances concept comprehension. However, a common goal is for students to be able to apply concepts in novel contexts. The current research investigated if provided examples can benefit novel application. All participants read a text containing definitions and one example for 10 psychology concepts. Participants either practiced retrieving concept definitions

or provided examples. On each trial, participants were given the concept term and were asked to recall and re-study the target information until correctly recalled three times. Two days later, participants completed tests, including example generation. The examples group outperformed the definitions group on the example generation test, showing that provided examples can benefit novel concept application.

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**Rebecca Jordan, Junior, Psychological Sciences**

Mentors: Angela Junglen, Graduate Student, Experimental Psychology, and Douglas Delahanty, Ph.D.

Substance Abuse Influenced by Gender and Interpersonal Trauma

A significant link between PTSD and substance abuse has been shown in recent literature. However, we aim to investigate if there is a relationship between gender and substance abuse when that individual experiences an interpersonal trauma. In presence of interpersonal trauma history (sexual assault, physical assault, physical assault with a weapon), does gender influence frequency substance

abuse? We hypothesize that there will not be a difference between gender and substance abuse for individuals who were exposed to an interpersonal trauma. Understanding the potential gender differences within substance and trauma may better inform whether treatment approaches should be tailored by gender for interpersonal trauma.

**Megan Kasperczyk, Senior, Psychological Sciences; Marissa Gastelle, Graduate Student, Psychological Sciences; Rachel Murrey, Junior, Psychological Sciences; and Josefina Grau, Ph.D.**

Mentors: Marissa Gastelle, Graduate Student, Psychological Sciences, and Josefina Grau, Ph.D.

Social Support from Adolescent Latina Mothers’ Fathers Is Related to Lower Psychological Distress

Adolescent Latina mothers are at increased risk for developing symptoms of psychological distress. High levels of poverty, acculturative stressors, and less education than other adolescents compound with stressors associated with parenting at a young age. Social support has been shown to reduce the risk of psychological distress, but several factors influence that relation. The current study examines associations between social support from adolescents’ mothers and fathers and psychological distress, and how

the associations may be moderated by familism. Results indicated that mother support was not related to lower distress but father support did. Familism did not moderate these relations. Findings expand research on grandfather support, but further research is needed to examine why there were differences in distress between mother and father support.

**Jessica Kotik, Junior, Psychological Sciences, Carly G. Nelson, Senior, Speech Pathology and Audiology**

Mentors: Christopher A. Was, Ph.D. and Erin Graham, Graduate Student, Psychological Sciences

Working Memory and Perception of Difficulty in Complex Category Learning

Does working memory (WM) capacity predict complex category learning and perception of task difficulty? We hypothesized that individuals with higher WM capacity would be more accurate when learning categories and that they would perceive the task as easier than individuals with limited WM capacity. In the present study, participants were presented with a complex category learning task, two measures of working memory capacity, a novel transfer task,

and a questionnaire asking them about strategy usage and perceived task difficulty. They were assigned to high and low WM groups based on scores from the two working memory capacity measures. Preliminary results indicate that the high WM group were more accurate when learning categories and also rated the task as less difficult than the low WM group.

**Jordan Lally, Senior, Psychological Sciences; Martale Davis, Graduate Student, Clinical Psychology; Delillah Elizey, Graduate Student, Clinical Psychology; Elizabeth Jean, Graduate Student, Clinical Psychology; Robert Stadulis, Ph.D.; Angela Neal-Barnett, Ph.D.; and Kallie Pettiti, Graduate Student, Clinical Psychology**

Mentors: Angela Neal-Barnett, Ph.D., and Robert Stadulis, Ph.D.

It Bothered Me: Stress Bother Intensity and The Acting White Accusation

The Acting White Accusation is one of the most negative accusations an African American adolescent can receive from one another. This accusation is typically put on African-Americans whenever they engage in behaviors that are deemed “white”. To further understand the relationship between The Acting White Accusation and perceived stress levels, our lab administered two separate assessments to approximately 81 female African-American adolescents.

Our first assessment was a perceived stress measure and the second assessment examined bother intensity of The Acting White Accusation. Results indicated that girls with prior perceived stress were more bothered by the accusation. Results also indicated that girls from a diverse setting experience more stress than those from a low-income setting. Implications of our findings are discussed.

**Kelly N. Legere, Sophomore, Psychological Sciences; Marna Drum, M.A.; and Bryan A. Jones, Ph.D.**

Mentors: Marna Drum, M.A., and Bryan A. Jones, Ph.D.

Assessing Changes in Criminalistic Thinking

Participants participated in treatment at NEOCAP (Northeast Ohio Community Alternative Program) and completed the How I Think Questionnaire (HIT) (Barriga & Gibbs, 1996) before and after treatment. We predict that residents

completing the treatment will exhibit less cognitive distortion and more positive thinking.

**Marranda Martin, Senior, Psychological Sciences**

Mentor: Angela Junglen, Graduate Student, Experimental Psychology

Effects of Drug of Choice on Memory and Cognition

Throughout the literature, it has been shown that drugs and alcohol affect brain. The brain regions and neural processes that underlie addiction overlap with processes and functions including learning, memory and reasoning (NIH). Exactly how much does an individual’s drug of choice impact memory and cognition differently during detox? We recruited participants at Oriana Detox Center voluntarily seeking detoxification from substance dependence. Throughout

the study, participants filled out several questionnaires regarding substance use behaviors and completed a cognitive assessment. The aim of this study is to investigate the impacts of different drugs on cognition at the early stages of sobriety. We hypothesize both opioids and alcohol will have negative effects on cognition and memory, but alcohol’s effects will be significantly more damaging.

**Rachel E. Mason, Senior, Psychological Sciences, and Rachel Murrey, Junior, Psychological Sciences**

Mentors: Josefina Grau, Ph.D., and Aimee Hammer, Graduate Student, Psychological Sciences

Acculturation Gap Among Adolescent Latina Mothers in Relation to Psychological Adjustment

Adolescent Latina mothers have the highest birthrate among all ethnic groups in the United States and are at higher risk of experiencing depressive symptoms. Maladjustment of the mother can result in other negative outcomes, such as poor parenting, family functioning, and child development. The current study examined the acculturation gap between mothers and grandmothers and how it is associated with mothers’ psychological adjustment. Results indicated that mother-grandmother dyads in which the mothers believed

that the grandmother viewed them as too Americanized, had mothers who experienced more psychological distress. Findings inform intervention efforts targeting depressive symptoms in this at-risk population. Findings suggest that interventions should focus on overcoming intergenerational and intercultural conflict, promoting mutual understanding and building skills that enhance communication.



**Kara M. Shaver, Sophomore, Psychological Sciences; Bradley Davis, Junior, Psychological Sciences; Anna Wise, Graduate Student, Psychological Sciences; and Douglas Delahanty, Ph.D.**  
Mentors: Anna Wise, Graduate Student, Psychological Sciences, and Douglas Delahanty, Ph.D.  
Parental and Child Empathetic Relationship Following Pediatric Trauma

Parent-child dyads were recruited from Akron Children’s hospital emergency department and completed questionnaires during their time in the emergency department and also at two-week post-injury .We hypothesize that children who are high in empathy and low in emotional distress immediately following the trauma will be associated with parental-acute stress symptoms at two-weeks post injury. Data collection is ongoing; however, results will be incorporated into the poster presentation. If we can identify these individuals immediately following the traumatic event, we can intervene with resilience strategies earlier in order to prevent the development of chronic distress, including posttraumatic stress symptoms.

**Rachel A. Suter, Junior, Psychological Sciences; Ashley N. Abraham, Graduate Student, Psychological Sciences; and Jocelyn R. Folk, Ph.D.**  
Mentor: Jocelyn R. Folk, Ph.D.  
Measures Matter: Reading Comprehension May Not Be the Best Measure of Reading Ability

Reading comprehension is often used to asses reading skill. However, recent research suggests that spelling may be a better indicator of reading ability (Andrew & Bond, 2009). The lexical quality hypothesis suggests that this is because high-skill spellers have strong representations of a word’s spelling and that the spelling is strongly connected to a word’s meaning (Perfetti, 2007). Therefore, high-skill spellers should spend less time processing words than high-skill readers. The current study assessed both reading comprehension and spelling ability. Participants were then asked to read sentences while their eye movements were tracked. Results show that there was a moderate correlation between reading comprehension and spelling ability,  $r=.30$ ,  $p<.05$ . Results also indicate that good spellers spend less time processing words than good readers. The results support previous research and indicate that spelling skill may be a better predictor of reading ability than reading comprehension measures.

**Lischele Watkins, Senior, Psychological Sciences**  
Mentors: Sohini Dutta, Graduate Student, Psychological Sciences, and Aaron Jasnow, Ph.D.  
Thy1 Neuron Activation in BLA Promotes Fear Inhibition and Attenuates Fear Reconsolidation

Thy1 neurons are a subset of glutamatergic neurons found throughout the brain, including the basolateral amygdala (BLA), a region important for controlling fear. We used chemogenetics (DREADDS), to selectively activate the Thy1 neurons in the BLA, combined with multiple tests of fear. We found that activating the BLA thy1 neurons following a 10-minute extinction training was effective in reducing fear when tested with passive avoidance paradigm. We also found that activation of the BLA thy1 neurons following a 30s-reactivation period significantly reduced fear when animals were tested 48 hours later. This suggests that thy1 neurons play an important role in attenuating fear under multiple learning conditions and may inhibit fear responses more generally.

**Angela Zachman, Senior, Psychological Sciences; Lisa Manderino, Graduate Student, Psychological Sciences; and John Gunstad, Ph.D.**  
Mentors: Lisa Manerino, Graduate Student, Psychological Sciences, and John Gunstad, Ph.D.  
Novel ImPACT Validity Indices Identify Sandbagging Regardless of ADHD Status

The ImPACT scores Word Memory Correct-Distractors and Design Memory Correct-Distractors have been proposed to better differentiate sandbagging, or intentional under-performance to hide post-concussive impairments, from genuine-effort performances. They were examined as validity indices in athletes with and without ADHD, who tend to score lower regardless of effort. Rates of protocol invalidity were compared chi-squared tests. The traditional validity indices flagged 3.4 percent of protocols as invalid, with a higher rate in athletes with ADHD. Protocol invalidity identified by DMTCD was significantly greater than that identified by traditional indices, though not significantly different between athletes with and without ADHD. Both identified sub-optimal performance equally in the groups, suggesting they may aid in differentiating athletes performing at their best from those with naturally occurring low baselines.

# SOCIAL SCIENCES/ EDUCATION/ PUBLIC HEALTH - POSTER

**Natalia Roman Alicea, Senior, Communication Studies/Applied Communication**  
Mentor: Suzy D’Enbeau, Ph.D.  
Ya no nos crían así: A Qualitative Study of Career Socialization of Latina College Students

The purpose of this study is to identify messages that Latinas receive regarding gender, college, and career. Even though Latinos/as are entering college at greater rates than before, only 13 percent of Latinos/as have attained at least a bachelor’s degree, which is frequently necessary in career development. However, career development is notably harder for Latinas in particular due to culture, values, and gender roles that influence their decision-making. Socialization theory and intersectionality theory provide a lens to explore the ways in which Latinas’ gender and career socialization patterns intersect. To this end, this study was guided by interviews with Latina undergraduate students from a midwestern university about a) their personal background and education, (b) messages received about college and career, and (c) messages received about gender.

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**Hayley S. Arnold, Ph.D.; Perri Waisner, Senior, Speech Pathology and Audiology; and Cydney Woodyard, Senior, Speech Pathology and Audiology**  
Mentor: Hayley S. Arnold, Ph.D.  
Inhibitory Control in Preschool-Age Children Who Stutter

The primary goal of this study was to investigate the relationship between inhibitory control and stuttering in preschool-age children. Participants were 16 children who stutter and 23 children who do not stutter. They were assessed using behavioral responses to three experimental tasks as well as parent responses to a questionnaire. Results indicated that age was significantly correlated to five of the eight inhibitory control measures. However, no significant difference between talker groups was found. The significant association between age and measures of inhibitory control suggests that age may be important. During the preschool-age years, group differences may not be as evident due to high levels of variability. Later in development, differences in inhibitory control may be more evident between groups.

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**Quinton Babcock, Junior, Economics, University of Toledo**  
Mentor: Kim Nielsen, Ph.D., and Gbenga Ajilore, Ph.D.  
The Expected Cost of Housing Discrimination

The aim of this research is to increase the understanding regarding discrimination in the home rental market, especially in a way that is applicable to individuals, by constructing a framework with which its expected cost can be found. After estimating an expected cost, this research seeks to use that cost as a platform to explore conditions surrounding this expected cost. Furthermore, this research makes a case for why this should be an important issue among disability studies scholars and disability rights activists.

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**Nina Darden, Junior, Public Health; Nejla Shaheen, Senior, Public Health; Tim Mikes, Senior, Public Health; and Cole Wojdacz, Junior, Public Health**  
Mentor: Cindy Widuck, M.P.H.  
The HateHate Campaign: A Dual Intervention Approach to Combatting Stigma Associated With an Increasing Resource Access for the LGBTQ+ Homeless Community

Twenty percent of homeless youth is LGBTQ+, while only 10 percent of the general population identify as part of the community. Risks associated with unreliable housing, decreased access to existing resources, and low resource navigation skills within this population has created significant barriers to ending the cycle of homelessness that disproportionately affects members of this community. The HateHate Campaign works to combat stigma and increase awareness through ally education and inclusion and decrease negative attitudes among the general population. Its sister site, HateHateResources (HHR), strives to build a new and accessible guide to connect the LGBTQ+ homeless population to needed resources.

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**Samuel M. Doerle, Senior, Pre-Medicine/Pre-Osteopathy; Vivek V. Jasti, Senior, Integrated Life Sciences; and Richard E. Adams, Ph.D.**  
Mentor: Richard E. Adams, Ph.D.  
Factors Affecting Adolescent Happiness in the United States

Several key variables have been previously identified as causative factors of teenage happiness: parental relationships, religiosity, and friendship quality. We hypothesize that substance use and deviance mediate the pathways of religiosity and parental relationships on happiness. Data were obtained from the 1994 National Longitudinal Study of Adolescent to Adult Health. The dependent variable, happiness, was formed as an index from the following items: suicidal tendency, depression and life satisfaction. A multivariate analysis was performed with several other independent demographic variables, such as sex and age. Results indicated that both religiosity and parental relationships have a positive association with happiness. This association is reduced when substance use and deviance are added to the analysis; these factors partially mediate the associations with adolescent happiness.

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**Isaac Floyd, Senior, Nutrition**  
Mentor: David Sharp, Ph.D.  
Te'māto Te'māto: How Does Your Cultural Identity Influence Your Health?

Race relations and perceived stereotype threat is a growing topic in the sciences. The purpose of this study is to assess the relationship between environmental pressures related to cultural identity and nutrition and other health behaviors. We aim to show how culture may affect how people behave as it relates to nutrition, and how well they can interpret standard nutrition labels and other information that they encounter every day under positive and negative cultural stimuli.

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**Sophia Greathouse, Senior, Economics**  
Mentor: Curtis Reynolds, Ph.D.  
Discrimination in the Restaurant Industry in Ohio

This paper explores the size of discrimination in the restaurant industry in Ohio in 1980 and 2010. OLS regressions were used in order to discover the differences in wages between different groups. A set of Oaxaca decompositions were implemented to determine how much of the difference, if any, could be attributed to discrimination. I found that African American workers made 14.8% less than their white counterparts. Discrimination may be even worse than this wage gap allows: when comparing African American workers to a counterfactual treated with white coefficients, the African American workers make 17.8% less than the white coefficient counterfactual. This effect seems nonexistent when comparing Hispanic and white workers. When comparing men and women, women make significantly less in almost every case.

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**Michaela M. Judy, Junior, Business Management**

Mentors: Tabitha M. Martin, M.A.; Trevor Watkins, M.S.; and Elizabeth Sinclair, M.A.

The Key Factors of Combat Uniforms that Contribute to Increasing Casualties in Modern Warfare

Combat uniforms are meant to protect our troops from the dangers they face on the battlefield. Gear designed specifically to protect service members from bullets have not been designed with recent combat environments in mind. After conducting several interviews, with veterans and current soldiers, the recommendations were to create a uniform that was more durable and breathable. Breathable

uniforms allow for air movement around the body, keeping them cooler in unbearable heat and protecting them from weather-related medical conditions, such as heat stroke. Also, soldiers sometimes will take off parts of their uniforms, such as their vests, because they are extremely hot, which affects the gear’s usefulness.

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**Aja Labrador, Senior, Economics**

Mentor: Lockwood Reynolds, Ph.D.

How Stagnant Wages Affect Housing Affordability

Data indicates average wages have remained stagnant since the 1980s. Research regarding stagnant wages and rising housing costs helps us understand what results from rising housing costs and static wages. Data is collected from counties in the United States between 1980 and 2014 to document that households are spending more income on rent on average. Then, I look for whether there are similar trends throughout all counties that may lead to inability to afford

housing. A quantitative analysis is used to conduct research and analyze data collected by each county. A hedonic regression is used to analyze results for replication and a closer look at characteristics affecting the inequality. Results show that nationally, people spend 5.65 percent more income on rent in 2014 than in 1980.

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**Claire Marshall, Junior, Sociology**

Mentor: Molly Merriman, Ph.D.

Sexual Consent in the Media: From Screen to Silence

Sexual Consent in the Media: from Screen to Silence will demonstrate how advertisements use sexual violence and lack of consent to objectify women and sell products. My project looks at sexual assault from the perspective of defining consent, not defining assault. Lack of understanding of how consent is defined is what I believe to be a key issue in sexual assault cases. I will

talk about the many different definitions of consent, where these definitions come from, and why it is damaging to not have a clear idea of what sexual consent is. I will show images of advertisements with slogans and images clearly indicating sexual violence. These images become what we think of as “normal,” and make sexual violence accepted in our society.

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**Veronica K. Musser, Junior, Speech Pathology and Audiology**

Mentor: Kelly Cichy, Ph.D.

Access to Health Care and Perceived Neighborhood Quality

Prior research suggests that neighborhood context contributes to an individual’s access to health care. This study expands upon prior research by exploring associations between perceived neighborhood quality and healthcare access and utilization. Based on prior studies, I hypothesize that those who perceive their neighborhood more favorably will also report greater access to health care. Data are from the second wave of the midlife in United States Survey

(MIDUS II). Respondents include 7,105 men and women (Mage =56). Participants responded about perceived neighborhood and a series of items about health care access and utilization. Lastly, participants provided demographic information. All analyses will control for demographics including gender, education and availability of health insurance. To test the hypothesis, I will examine the associations between perceived neighborhood quality and health care utilization.

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**Veronica K. Musser, Junior, Speech Pathology and Audiology; Madeline Steward, Junior, Psychological Sciences and Sociology; and Jake Graff, Senior, Psychological Sciences and Sociology**

Mentor: Richard Adams, Ph.D.

“Our Kids” An Extension of Robert Putnam’s Study of the Wealth Gap Inequality in America Hudson and Ravenna: Miles Apart Yet Worlds Apart

Over the past 60 years, the gap between social classes in terms of wealth and income has been growing rapidly, and in turn has created a great inequality in life chances between the upper and lower class. The current study is a continuation of Robert Putnam’s scholarly study, “Our Kids,” where we compared two Ohio cities: Hudson and Ravenna. In Hudson, 68.9 percent of individuals obtain a bachelor’s degree or higher compared to Ravenna, where only 13.3

percent of individuals have a bachelor’s degree or higher. We hypothesized that Ravenna, having a lower socioeconomic status, would have more barriers to learning than Hudson, with the higher socioeconomic status. Our study consisted of database searches and in-depth interviews regarding the experience of a typical high school student in that city.

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**Julie Novario, Junior, Public Health; Jessica M. Lockhart, Senior, Public Health; Abigail E. Day, Senior, Public Health; and Travis J. Wisler, Senior, Public Health**

Mentor: Cindy Widuck, M.P.H.

W.H.Y. Campaign – We Hear You: Improving Mental Health in College Freshmen

Depression and anxiety in college freshman has grown from 10-15 percent in the 1980s to 33-40 percent today. Through research on previous interventions and statistics collected from colleges across the United States, we have determined that mental illness on college campuses goes unrecognized. Concern of stigma is the number one reason students do not seek help. From these findings, we have developed an intervention to implement in freshman courses

and residence halls. Our campaign, We Hear You (W.H.Y.), aims to improve mental health in college freshmen through multimedia using creative mental health educational presentations and connecting students efficiently with on- and off-campus mental health resources. We wish to see reduction in stigma of mental illness by use of surveys before and after the intervention.

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**Abigail Elaine Recker, Senior, Early Childhood Education; Bridget Mulvey, Ph.D.; and Joseph Ortiz, Ph.D.**

Mentors: Bridget Mulvey, Ph.D., and Joseph Ortiz, Ph.D.

Becoming Scientists: Investigating Human Impact on Water

This unit helps students in grades three to five understand how natural resources are impacted by human actions through observation, inference and the use of scientific tools and data. Students act as Dr. Ortiz's assistants to help find out why the water in Lake Erie is polluted. They examine water samples from local water sources, make observations and inferences, and research their ideas with support. Finally, the students create an action plan to make a difference and

share their findings with Dr. Ortiz. This hands-on approach to science content supports high levels of engagement and an intrinsic motivation to learn. Language arts standards are integrated with science standards in this problem-based science unit. Student learning is assessed through work samples and an observational checklist.

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**Katherine Reynolds, Senior, Speech Pathology and Audiology**

Mentor: Jennifer Roche, Ph.D.

Effects of Emotional Contagion on Texting

Face-to-face communication uses multimodal behavioral cues (e.g., tone of voice and facial expression) that are available to facilitate accurate interpretation of intentions. Unfortunately, these cues are limited with involvement in computer-mediated communication (e.g., texting). In recent research, it has been indicated that vocal tone in text, may be expressed through the use of punctuation (Gunraj et al., 2016). It is currently less well known how

punctuation impacts a receiver's emotional experience with a "rude" or "kind" texter. Results indicated that receivers tended to avoid contentious communicative interactions by diverging emotionally, but promote the positive interaction by converging emotionally. This is interesting because it provides insight into the emotional contagion literature that says maximal convergence is not always useful.

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**My'Quella Swogger, Senior, Fashion Merchandising**

Mentor: Linda Hoeptner-Poling, Ph.D.

The Effects of Poverty on McNair Scholars' Educational Attainability

This presentation examines a study on the effects of poverty on first-generation college students who are currently earning an undergraduate degree as McNair Scholars. The purpose of this study was to reveal well-being as it has strong correlations to educational attainment and poverty, and aims to reveal the manifestation of poverty in undergraduate students' lives, particularly those in the McNair Scholars Program and how poverty

affects their academic achievements specifically as first generation college students. The goals of this study include (a) reveal information that might contribute to the success of McNair and other TRIO participants, (b) contribute to existing research on how to work towards class equity, economic justice and educational reform, and (c) provide an opportunity to share participants' expressive stories about their college journey thus far.

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**Nicole E. Teefy, Senior, Public Health, and Cindy Widuck, M.P.H.**

Mentor: Cindy Widuck, M.P.H.

Eating Affordable Together

Our intervention, Eating Affordable Together, provides young adults and their families with education and skills to achieve a healthy lifestyle while reducing the obesity in adolescents within Portage County. The obesity rate since the 1980s in teens has gone from 5 percent to over 20 percent. In Portage County, 15 percent of youth are considered obese. We are focusing on adolescents and their parents because adolescents depend on these parents or legal guardians for guidance and resources such as food. We would like to implement workshops consisting of healthy cooking demonstrations, budgeting classes and different

diet options. With the series of classes for an after-school program, over time we will implement every aspect we feel necessary to have within an individual's lifestyle to be as healthy as possible.

Portage County Health Assessment. (2016) Community Health Status Assessment. Examining the Health of Portage County. Childhood Obesity. Retrieved from <http://www.kentpublichealth.org/Portage%20FINAL%20Health%20Assessment%20with%20Cover%203-3-16.pdf>

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**Blissamber S. White, Senior, Speech Pathology and Audiology, and Hayley S. Arnold, Ph.D.**

Mentor: Hayley S. Arnold, Ph.D.

How Exercise Influences Speech Fluency in Individuals Who Stutter

This case study of a person who stutters assesses the effect that short bouts of exercise have on speech fluency in a subsequent speech task. By comparing the effects of a bout of exercise with intervals to a sedentary condition during a speech, we will be able to see how speech fluency is impacted. After the participant rode a stationary bike for the exercise condition and watched a television show for the sedentary condition, the participant was asked to prepare

and deliver a short speech. Speech fluency, autonomic arousal and self-reports of stress were measured. Stress reactivity, heart rate and stuttering difficulty had a positive relationship. Results showed more disfluencies after the exercise condition. Further research is being done to expand upon what influences stuttering.

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**Cindy Widuck, M.P.H., Public Health; Mercedes Curren, Senior, Public Health; Jessica Lockhart, Senior, Public Health; Beatrice Miller, Senior, Public Health; Rachel Tippet, Senior, Public Health; Kasey Warner, Senior, Public Health; and Cole Wojdacz, Junior, Public Health**

Mentor: Cindy Widuck, M.P.H.

Hunger and Homelessness Pilot Week 2016: Raising Awareness through Education and Inclusion

Ohio is ranked in the top 50 percent of states in regards to food insecurity and has the highest rate of child poverty among the 50 largest cities in the United States. Some 58,000 students identified as homeless on their financial aid in 2013. This coupled with anecdotal evidence from Kent State University's campus motivated our team to

partner with the community to educate the public and promote resources to combat hunger and homelessness in the campus population. Through community collaboration and education, our team was able to plan and execute a week of events centered around community, fundraising and direct service.



# ORAL

## Drake Bailey, Senior, Anthropology

Mentor: Austin H. Johnson, Graduate Student, Sociology  
LGBTQ College Student and Hook-Up Culture

With hook-up culture becoming more widespread on college campuses, there has been a significant increase in academic literature based on this phenomenon (Garcia et al., 2012; Heldmen and Wade 2010; Monto et al. 2014). However, the existing literature on hook-up culture among college-aged students is substantially lacking in accounts and narratives from LGBTQ identifying students. Analyzing data from an

anonymous, open-ended, online survey conducted with LGBTQ college students, this paper addresses this gap in the literature. This paper explores LGBTQ students’ perceptions of and orientation to the hook-up culture to determine whether their experiences differ from their heterosexual and cisgender peers.

## Bethany Holland, Senior, Sociology

Mentor: Clare Stacey, Ph.D.  
Social Rhetoric Shaping Lesbian Identity

Social rhetoric often portrays lesbians as hypersexualized, aggressive and predatory. Yet, there is a lack of research on how this negative social rhetoric shapes lesbian identity. I seek to fill this gap in the literature by addressing this question. To do this, I use structured interviews conducted in 2016 with five lesbians at a university in Northeast Ohio. My findings from these interviews demonstrate that social rhetoric in the media influences women’s sexuality at a young age. Also, media and religion collectively create

significant amounts of negative social rhetoric, including the stereotypes that these women face. Finally, all of the women believe that sexuality is very complex and is developed by many different social and biological factors. With this research, I hope to better understand how social rhetoric shapes lesbian identity and to influence society away from using negative social rhetoric to represent lesbians because its affects how they form their identity.

## Vihanga Perera, Senior, Pre-Medicine/Pre-Osteopathy; Olivia Green, Senior, Integrated Life Sciences; and April Enger, Senior, Integrated Life Sciences

Mentors: Richard Adams, Ph.D., and Clare Stacey, Ph.D.  
Life Factors Leading to the Behavior of Maternal Prenatal Smoking

Smoking during pregnancy is the primary preventable cause of detrimental fetal results. The secondary data set, National Pregnancy and Health Survey: Drug Use Among Women Delivering Live Births, 1992, found on ICPSR, was utilized to analyze the connection between life factors and likelihood of maternal prenatal cigarette smoking. We analyzed mothers on an individual level and utilized questionnaires that were distributed at sample hospitals in addition to select medical records. After analysis, the risk factors for maternal smoking were: race, education, employment status, marital status,

number of previous pregnancies, and number of weeks pregnant before first prenatal visit. Looking at how smoking behaviors change over the course of a pregnancy and what life factors influence smoking cessation could help decrease the prevalence of maternal smoking.

## Lakysha R. Robinson, Senior, Criminology

Mentor: Julie Globokar, Ph.D.  
IDEA: Examining the Over-representation of African-American Students With Disabilities from 2013-14

The purpose of this study is to detect whether there is an over-representation of African-American students with disabilities being served under IDEA in school districts in

Wisconsin. This study will also examine what school factors might explain this variation.

## Thimberley Morgan, Sophomore, Speech Pathology and Audiology; Jennifer Roche, Ph.D.; and Nicole Craycraft, Vanderbilt University

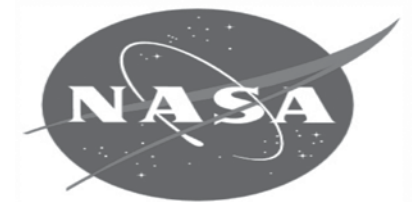
Mentor: Jennifer Roche, Ph.D.  
Avoiding Miscommunication May Be Problematic for Conversation

Miscommunication is often seen as something that should be avoided when communicating. When individuals perceive the conversation to be filled with communication errors, there is often a feeling of disappointment because effective communication is essential to social interaction. This project shows that miscommunication beneficially impacts our automatic cognitive processes by recruiting attentional resources when information is not clearly communicated.

It was found that when communication seems ambiguous, the individual pays more attention overall. However, this is only when information is communicated in a way that is salient or attention grabbing, but not necessarily when this mode of communication becomes predictable. Therefore, miscommunication may in fact become beneficial when it prompts an individual to pay attention.

# The Ohio Space Grant Consortium Undergraduate Research Symposium Best Poster Award

This award is given to the best poster presented at the Undergraduate Symposium on Research, Scholarship and Creative Activity and represents the best submission among the non-health science related posters on a topic relevant to the National Air and Space Administration (NASA) and the Ohio Space Grant Consortium (OSGC). The award will be presented by Joel D. Ortiz, Professor, Department of Geology and Ohio Space Grant Consortium Campus Representative.



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# Provost’s Leadership Academy

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The Provost’s Leadership Academy provides incoming Kent State University students with a unique leadership experience on campus. The mission of the Provost’s Leadership Academy is to develop leadership in talented first-year students. The vision of the Provost’s Leadership Academy is that the participating students will become leaders and change agents in the university community.

During the fall semester, the academy’s goal is for participants to understand their leadership style, each other, and the community through activities and programs, from which they will generate a list of possible areas of concern within the university community that could be addressed. During the spring semester, students work in teams of seven to 10 students with a peer mentor to develop a project proposal that will create a solution or improve a possible need or area of concern within the university.

Please join us in welcoming our newest researchers. Their presentations can be observed in Room 314, Kent Student Center from 1 – 3:30 p.m. today.

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## Student Research Groups

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**Stephanie Baker, Freshman, Pre-Nursing; Gabrielle Calder, Freshman, Fashion Merchandising; Noelle Elliott, Freshman, Digital Media Production; Nicholas Marsteller, Freshman, Entrepreneurship and Managerial Marketing; Mackenzie Phelps, Freshman, Political Science; Emma Seyffert, Freshman, Fashion Merchandising; Mengting Yuan, Freshman, Fashion Merchandising; Serena Zacour, Freshman, Speech Pathology and Audiology; and Michael Zapotosky, Freshman, Athletic Training**

Mentor: Abigayle Horton, Junior, Speech Pathology and Audiology

Project: Swipe Swap

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**Rachel Aldrich, Freshman, Pre-Nursing; Bradley Dennis, Freshman, Psychology; Laura Fox, Freshman, Visual Communication Design; Holly Gustafson, Freshman, Fashion Design; Mackenzie Hanuscin, Freshman, Early Childhood Education; James Hoyt, Freshman, Criminology and Justice Studies; Gabriella Moreland, Freshman, Biology; Kayla Proctor, Freshman, Public Relations; and Elizabeth Smith, Freshman, Architecture**

Mentor: Carmen Dotterer, Sophomore, Visual Communication Design

Ucommute

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**Diamonique Bagley, Chemistry (Pre-Medicine); Emily Engler, Biotechnology; Niles Hand, Architecture; Kathleen McHugh, Pre-Nursing; Nathan Reineck, Journalism; Kylee Saksa, Exploratory; and Ellen Stingel, Fashion Merchandising**

Mentor: Lindsay Jespersen, Senior, Bio-Chemistry

Kent Connection

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**Kody Elsayed, Public Relations; Hannah Engle, International Relations; Caroline Henneman, Public Relations; Montgomery Hujar, Fashion Merchandising; Hannah Jones, Early Childhood Education; Krista Mattern, Biology; Seneca Powers, Fashion Merchandising; Natalie Quaglieri, Engineering Technology; and Mallory Schmelzer, Accounting**

Mentor: Clara Sullivan, Sophomore, Public Relations

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Club Hub

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**Meeghan Barrett, Fashion Design; Rachel Berg, Nutrition; Kelly Corey, Marketing; Julianne Enwright, Visual Communication and Design; Maura Flaherty, Architecture; Jeffrey Gonzalez, Sports Administration; Samantha Greene, Integrated Language Arts; Kaitlyn Johnson, Managerial Marketing; Anna Massey, Fashion Design; and Robert Matos, Business**

Mentor: Jessica Kotick, Junior, Psychology

Light the Way

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**Cheyenne Battle, Fashion Merchandising; Brittany Berg, Interior Design; Abigail Ferraro, Fashion Merchandising; Fearon Himes, Biology; Tori Lones, Architecture; Matheus Nobre Priosti, Biology; Monae Pouliot, Fashion Merchandising; Charla Shellenberger, Psychology; and Jenna Vicker, Pre-Nursing**

Mentor: Luis Pena Ochoa; Psychology, Sophomore

Kent Go Home

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**Julia Anderson, Interior Design; Erin Bauer, Fashion Merchandising; Alyssa Dressman, Biology; Megan McGraw, Marketing; Sean Moore, Criminology and Justice Studies; Emilee Piorkowski, Fashion Merchandising; Konner Wolfe, Aeronautics and Applied Engineering; JoBeth Wyatt, Marketing and Psychology**

Mentor: Sydney Shackelford, Senior, Public Health

Flash Defense

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**Rachyl Anderson, Sociology; Suzanne Hales, Biology; Kathryn Kleinhans, Translation; Leah Lebrew, Fashion Merchandising; Riyon Lee, Fashion Merchandising; Nafees Mahmood, Computer Science; Dana McKinney, Photo Illustration; and James Trombka, Exploratory**

Mentor: Wyatt Mauti, Sophomore, Pre-Nursing

Flash Trips

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