UNION UNIVERSITY

Fall Poster Session

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TUESDAY, NOVEMBER 16, 2021

SUB Hallway | 11 a.m. –12:30 p.m.

Student Presenters

Art

Maria Wentley | "History and Influence of Woodblock Type"

Ashley Thompson | "Miriam Schapiro and Femmage: Making a Way for Women in the Art World"

Elaina Fuller | "Miriam Schapiro and Femmage: Making a Way for Women in the Art World"

Breanca Gregory | "Media Used as Propaganda During World War II"

Madi Blackburn | "The Effects of Art Therapy in Improving Social Skills and Adaptability in Children with ASD"

Biology

Shelby Swaby | "An Initial Analysis of Plant Composition of a Wetland Mitigation Site in Fayette County Tennessee"

Gavin Woodring | "The Effects of Temperature on the Feeding Kinematics of Convict Cichlids"

Callie Wofford | "The Effects of Glyphosate on *Pax6* Expression in Zebrafish"

Grant Jacobs | "Applying a Novel Technique to Quantify Corticosterone Levels in American Alligators *(Alligator mississippiensis)*"

Amanda Gilbert | "Using Mice as a Model to Study the Effects of a Ketogenic Diet on Psoriasis-Like Skin Inflammation"

Bethany Wells | "Components of Staphylococcus epidermidis Biofilm and Inhibiting Factor in Pseudomonas fluorescens Supernatant"

Charley Kate Barcroft | "Effects of Glyphosate Exposure on *HuC* Expression in Developing Zebrafish Embryos"

Allison J. Marsch | "Identifying Ecosystem Drivers of *Thalassia testudinum* Communities in Puerto Rico and Southwestern Florida"

ART

History and Influence of Woodblock Type

Presenter: Maria Wentley
Faculty Advisor: Haelim Allen

From the road signs we pass on the highway to the packaging of salt in our stores, visual design is all around us. The choices designers make in their work, subtle that they may be, contribute to memories of a favorite gum wrapper or first CD album cover. These visual associations become a part of who we are. This is why typography, the style and display of letterforms and characters, plays an important role in our lives. Since the beginning of written language, typography has changed and adapted according to the tools used to make letters. Different innovations and techniques sculpt new fonts, and with industrialization in the 1800s, woodblock type, large movable type cut out of wood, introduced new styles and personalities never seen in typography. During the nineteenth century, woodcut type dominated the market and sparked a shift in style that continues to influence typography today.

Art Education in the Public School System

Presenter: Ashley Thompson
Faculty Advisor: Haelim Allen

In recent years, a significant shift has occurred in the United States public education system. With the ever-increasing priority of high stakes testing, the arts are devalued or even eliminated from the curriculum. Arts education is often seen as just an addition to the core academic subjects and not as an essential element to a child's educational growth. However, art advocates like Bruce Taylor (2011) argue that the arts improve critical thinking and problem-solving skills (p. 22). Studies show that when art is integrated as an essential element in the curriculum, K-12 students are more engaged and reach higher levels of learning and achievement (Rabkin and Redmond, 2006, p. 60). Art-making is not reserved only for a select few, but rather every student can benefit from an arts-infused curriculum. The arts provide a holistic education that will serve students throughout life. The skills that students gain from having an art education prepare them for the creative thinking and problem-solving abilities needed to contribute to society as versatile individuals.

Miriam Schapiro and Femmage: Making a Way for Women in the Art World

Presenter: Elaina Fuller
Faculty Advisor: Haelim Allen

Miriam Schapiro is an artist who became well known during the Feminist Movement centered in America in the 1970's. Her mediums included painting, sculpture and printmaking. Many of Miriam Schapiro's art pieces, especially those made during the height of her career, feature imagery and objects that are reflective of women and domesticity. Schapiro invented a new word and vocabulary to give legitimacy to this previously unnamed form of art she and many of her fellow female artists engaged in. Her term for it was "femmage." Schapiro states, "Femmage: a word invented by us to include all of the activities as they were practiced by women using traditional women's techniques to achieve their art-sewing, piecing, hooking, cutting, appliquéing, cooking and the like--activities also engaged in by men but assigned in history to women.1" Schapiro also included women in her art pieces by collecting personal items from them during her trips, lectures, and classes and then integrating them into her art pieces. This study will examine how Miriam Schapiro saw the importance of giving recognition to the broader community of woman by inventing the word "femmage," but also by including individuals in her art practice through usage of donated material.

[1] Miriam Schapiro and Melissa Meyer, "Waste Not Want Not: An Inquiry into what Women Saved and Assembled--FEMMAGE." Heresies I, no. 4 (Winter 1977-78): 66-69

Media Used as Propaganda During World War II

Presenter: Breanca Gregory
Faculty Advisor: Haelim Allen

Propaganda uses facts, or allegations to further one's cause or to damage the opposer. Photography and film have become the best tools for propaganda since people have a tendency to believe what they see. These tools were used to communicate with the masses and grew as tools of persuasion. During World War II, many nations used these media in their propaganda to win over the people and support the governments' cause. The axis powers, Germany, Italy, and Japan, used photographs and films to spread their idealism and to indoctrinate the young. The axis powers demonstrated hatred for the Jewish race and indifference to their fate and strong national community. The invasion of Poland brought a war declaration from the allied powers of England and France. The United States soon followed the allies after Japan attacked Pearl Harbor. The allied powers used the same forms of propaganda to achieve support in enlistment, conserving metal, carpooling, and gathering weaponry. This research will further investigate the many examples of how media was used as propaganda during this era.

The Effects of Art Therapy in Improving Social Skills and Adaptability in Children with ASD

Presenter: Madi Blackburn
Faculty Advisor: Haelim Allen

Art therapy offers unique approaches for the treatment of children with autism spectrum disorder (ASD). According to the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5), the two main challenges experienced within ASD are difficulty communicating in a social context and confinement to rigid behavior patterns. Art therapy specifically addresses these concerns by fostering growth in communication skills and adaptability to different environments through the creative process. Art making in the structured environment of art therapy can provide a safe space for children with ASD to express themselves, thereby resulting in improved social skills. This paper will address how the sensory nature of art making is used in art therapy to help children with ASD function in a world that demands social skills and adaptability to the environment; this will be accomplished by examining qualitative data from individual and small group studies as well as tacit knowledge from various art therapists.

BIOLOGY

An Initial Analysis of Plant Composition of a Wetland Mitigation Site in Fayette County Tennessee

Presenter: Shelby Swaby
Faculty Advisor: Michael Schiebout

A plant survey was done at the Rossville Mitigation Site in Rossville, TN. This site has been selected as a wetland mitigation site for the state of TN and is currently being converted from cropland into a wetland system. The objective of the study was to establish a flora baseline and to determine wetland status of current plants as well as to evaluate species composition compared to a bottomland reference site. This baseline data will help determine the success of the conversion process. The survey was conducted from April – July 2021 and represents vegetation composition for the first year of transition. During this 4- month study, 45 families, 99 genera, and 79 species including infraspecific taxa were identified. The mitigation site and reference site had 32 duplicate plants. The mitigation site had more invasive species than the reference site based off of survey size. This was expected for a site this early in the process of being re-establishing as a wetland area.

The Effects of Temperature on the Feeding Kinematics of Convict Cichlids

Presenter: Gavin Woodring
Faculty Advisor: James R. Kerfoot

Temperature regulates the metabolism of ectotherms, such as fish, so it should influence how invasive fish feed as they move into areas that experience cooler temperatures. We used convict cichlids for this experiment, as they are a known invasive species in Florida, and theorized that changes in temperature would affect their feeding. We recorded fish feeding at 30°C, 24°C, and 20°C using a highspeed camera. We analyzed the videos, determined the average duration of feeding, time to max gape, and attack velocity. Our results showed no statistical difference between the different temperatures at any parameters. This could indicate convict cichlids adapt easily to temperature change, although we only tested 4 fish, and they were quite small. Future tests should include greater fish numbers to verify our results.

The Effects of Glyphosate on *Pax6* Expression in Zebrafish

Presenter: Callie Wofford
Faculty Advisor: Hannah Henson

The *pax6* gene is a crucial gene for brain and eye development in zebrafish. The gene is so complex that it has been classified into *pax6a* and *pax6b*. When this gene is altered, it results in ocular diseases and malformations. Glyphosate, a chemical commonly used in pesticides, has been hypothesized to cause some of these, and this study examined if glyphosate altered *pax6* gene expression in zebrafish *(Danio rerio)* after exposure. Zebrafish were bred, embryos were collected, and exposed to glyphosate until they were five days old. The gene was then assessed by way of cDNA synthesis by PCR and an unpaired t test. Although not statistically significant, an increase in *pax6a* expression and a decrease in *pax6b* expression were found.

Applying a Novel Technique to Quantify Corticosterone Levels in American Alligators *(Alligator mississippiensis)*

Presenter: Grant Jacobs
Faculty Advisor: James R. Kerfoot

Corticosterone (a stress hormone) levels of American alligators from conditioned water samples in various feeding trials, with or without a conspecific, were measured. Studies have found it possible to measure corticosterone levels of amphibians by using water samples, however, it has never been tried in American alligators. Using 6 blood samples as a baseline, 38 water samples were collected from 6 alligators. These samples were collected before and after individuals were presented with food alone and then paired with a conspecific, to see if competition induced stress. Water and blood samples were filtered, and corticosterone was extracted for each treatment. An ELISA assay was used to quantify corticosterone concentration and levels in both blood and water samples were higher after the treatment with a conspecific, however the difference was not significant.

Using Mice as a Model to Study the Effects of a Ketogenic Diet on Psoriasis-Like Skin Inflammation

Presenter: Amanda Gilbert
Faculty Advisor: William Thierfelder

Psoriasis is a chronic, inflammatory, autoimmune disease that causes itchiness, erythema, painful lesions, and plaques on the skin. This study used mice as a model to determine whether a ketogenic diet helps relieve inflammation caused by a psoriasis-like skin condition. Mice were shaved and treated with imiquimod cream on their backs for one week and fed a ketogenic diet for one week while continuing treatment. Systemic inflammation was quantified by isolating spleen lymphocytes and using PCR to determine expression of pro-inflammatory cytokines IL-17 and IL-23 and anti-inflammatory cytokines IL-10 and TGFβ Local inflammation was analyzed by harvesting lymphocytes from the affected skin area and using PCR to quantify their levels of the same pro- and anti-inflammatory cytokines. The results of this study showed that a ketogenic diet increased systemic and local inflammation in mice. Therefore, a short-term ketogenic diet would not be a recommended treatment for patients suffering from psoriasis.

Components of *Staphylococcus epidermidis* Biofilm and Inhibiting Factor in *Pseudomonas fluorescens Supernatant*

Presenter: Bethany Wells
Faculty Advisor: Esther Choi

Staphylococcus epidermidis is of medical importance because it causes nosocomial infections on inserted medical devices. We investigated the composition of *Staphylococcus epidermidis* wt 1457 biofilm. We first examined which biomolecules compose the biofilm by inhibition with supernatant and inhibitors. Since biofilm are composed of lipids, polysaccharides, proteins, and nucleic acids, we looked at the polysaccharide and protein portions using inhibitors such as Proteinase K and NaIO4. The second aim focused on what component in the supernatant inhibited biofilm development. Lipase treated supernatant was added to biofilm and compared to non-lipase treated supernatant biofilm development. Our results indicated that polysaccharides were in the biofilm, but the results were inconclusive regarding the presence of proteins. Likewise, lipase-treated supernatants did not consistently affect the biofilms in a different way than the untreated supernatants. We are hopeful that further investigation of *Staphylococcus epidermidis* biofilm components will lead to treatments for *Staphylococcus epidermidis* nosocomial infections.

Effects of Glyphosate Exposure on *HuC* Expression in Developing Zebrafish Embryos

Presenter: Charley Kate Barcroft
Faculty Advisor: Hannah Henson

Autism spectrum disorder (ASD) is a complex neurodevelopmental disorder characterized by atypical behaviors such as social impairment and repetitive behaviors. Those who suffer from ASD struggle to communicate effectively, and some need assistance in daily tasks. ASD is common, but there is no definitive cause. Pesticide exposure contributes to neurodevelopmental disorders. *Hu*C is a protein in the central nervous system and is a marker in developing zebrafish *(Danio rerio)*. In this study, zebrafish embryos were exposed to 50 μg/mL glyphosate, a compound commonly found in pesticides, for 4 days. At 4 days, a whole mount immunohistochemistry was performed to determine differences in *Hu*C protein expressions. *Hu*C expressions were calculated using corrected total cell fluorescence (CTCF), and a 2-tailed t-test was performed at β=0.05. Glyphosate-treated embryos showed less CTCF than the controls, but there was no difference in *Hu*C expressions between the control and the treatment (p=0.087).

Identifying Ecosystem Drivers of *Thalassia testudinum* Communities in Puerto Rico and Southwestern Florida

Presenter: Allison J. Marsch
Faculty Advisor: James R. Kerfoot

Populations of *Thalassia testudinum*, an important seagrass species found throughout the Caribbean Sea and Gulf of Mexico, have experienced decline. Collaborative research efforts have increased, but decline is variable and dynamic, requiring site-specific research. We measured the impact of environmental and community variables on *T. testudinum* growth in four sites: two in Jobos Bay, Puerto Rico; one in Charlotte Harbor Aquatic Preserve, Florida; and one in Rookery Bay, Florida. Community structure and environmental variables were measured in 20 quadrats across four transects at each site. Akaike Information Criterion (AIC) models evaluated the interaction of community and environmental variables on *T. testudinum* cover, density, and height. The interaction between light and community structure best explained cover, light and environment best explained density, and no variables best explained height. Our research may suggest which factors regulate and influence *T. testudinum* populations in these sites and across its range.

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