

Symposium on
Undergraduate Research
2022



Wednesday, March 30
Tallahassee Community College

**Presented by the Tallahassee Community College
Council on Undergraduate Research**

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This year's Undergraduate Research Symposium would not have been possible without the very generous support of the TCC Foundation, which has financially supported the program since its inception four years ago. Their continued support provides for refreshments, production of publicity materials, the printing of high-quality full-color posters, the cost of printing this booklet, and cash prizes for students. We are so grateful to all of the TCC Foundation's generous donors for their support of this worthy cause.



SCHEDULE AT A GLANCE

9:30-10:30	Oral Presentations FPAC 104
10:45-11:45	<i>3-Minute Thesis</i> Video Presentations (Virtual) Zoom Meeting ID: 969 2685 8872 (https://tccfl.zoom.us/j/96926858872)
12:00-1:00	Visual Arts Student Talks Student Union Ballroom
1:00-2:00	Poster Presentations Student Union Ballroom
2:00-3:00	Performing Arts CH 137
3:30-4:30	Awards Ceremony Student Union Ballroom

FULL SYMPOSIUM SCHEDULE

9:30-10:30 — Oral Presentations, FPAC 104

"Addiction to Behavior"

Joshua Davey

Faculty Advisor: Dr. Gina O'Neal-Moffitt

**"How Borderline Personality Disorder Can Severely Impact
One's Quality of Life and Self-Image"**

Julia Fernandes Bugarin

Faculty Advisor: Dr. Gina O'Neal-Moffitt

"An Analysis of MeTooChina"

Allison Grove

Faculty Advisor: John Schultz

"Anglophone Crisis"

Allison Grove

Faculty Advisor: John Schultz

"How Does Being An Only Child Affect You"

Taylor Hamilton

Faculty Advisor: Dr. Nick Vick

**"The Correlation between Beer and Yeast Cultivation
and the Rise of Civilization"**

Amiri Thorpe

Faculty Advisor: Dr. Nick Vick

10:45-11:45 — 3-Minute Thesis Video Presentations, Zoom
<https://tccfl.zoom.us/j/96926858872>

"The Interpretation of Mental Illness in the Visual Arts"

Laney Anderson
Faculty Advisor: Lindsey Smitherman-Brown

"The Diminishing Nature of George Balanchine's Philosophy and Technique"

Mackenzie Childs
Faculty Advisor: Dr. Nick Vick

"How Does Practicing Gratitude Affect Mental and Physical Well-Being?"

Katherine Cox
Faculty Advisor: Dr. Gina O'Neal-Moffitt

"The Importance of Virtual Reality in the Development of Leadership Soft Skills"

Jugeldi Garcia
Faculty Advisor: Patrick McDermott

"Artificial Intelligence and Machine Learning"

Justin Garcia
Faculty Advisor: Dr. Renee Gordon

"The Impact of Television on Children"

Alexia Jean
Faculty Advisor: Dr. Nick Vick

"'Save the Bees' — Effects of Urbanization and Local Habitat Characteristics on Bees in Texas"

Sarah Toole
Faculty Advisor: David McNutt

12:00-1:00 — Visual Arts *Artist Talks*, Student Union Ballroom

"Perception of Self"

Emily Avello

Ljiljana Obradovic-Edmiston, Faculty Advisor

"Dark Inside"

Devin Box

Ljiljana Obradovic-Edmiston, Faculty Advisor

"The Golden Hour"

Lamoria Brady

Ljiljana Obradovic-Edmiston, Faculty Advisor

"Branches"

Racheal Braley

Ljiljana Obradovic-Edmiston, Faculty Advisor

"Curiosity Kills the Cat"

Lynley Brodbeck

Ljiljana Obradovic-Edmiston, Faculty Advisor

"How Romantic"

Ryan Cake

Ljiljana Obradovic-Edmiston, Faculty Advisor

"Color Value Portrait"

Camryn Castellano

Ljiljana Obradovic-Edmiston, Faculty Advisor

"A Night Landscape of Ruins"

Rhiannon Castillo

Ljiljana Obradovic-Edmiston, Faculty Advisor

"A Change in Portraiture Due to the Pandemic"

Ambar Collazo Cabrera

Julie Baroody, Faculty Advisor

"The Nails of the Cross"

Parker Edison

Julie Baroody, Faculty Advisor

"Where Engineering and Art Intersect"

Kamaria LaPread
Dr. Renee Gordon, Faculty Advisor

"In the Eye of the Beholder"

Dean Newman
Julie Barood, Faculty Advisor

"Sunflower Self-Portrait"

Rachel Ostrander
Ljiljana Obradovic-Edmiston, Faculty Advisor

"Monochromatic Oil Still Life"

Kristen Rasmussen
Ljiljana Obradovic-Edmiston, Faculty Advisor

"The Reality of Dance"

Allie Shimko
Dr. Nick Vick, Faculty Advisor

"Branch Drawing"

Katelyn Shuler
Ljiljana Obradovic-Edmiston, Faculty Advisor

"'Is Art Essential' GIF and MP4 by Julia Tentzerakis"

Julia Tentzerakis
Julie Barood, Faculty Advisor

"'Expression Silver Jewelry Collection,' 2022"

Julia Tentzerakis
Julie Barood, Faculty Advisor

"Master Copy of Cezanne 'Still Life with Apples and a Pot of Primrose,' C. 1890"

Julia Tentzerakis
Ljiljana Obradovic-Edmiston, Faculty Advisor

"Master Copy of John Singer Sargent's, 'Dinner Table at Night,' C. 1894"

Julia Tentzerakis
Ljiljana Obradovic-Edmiston, Faculty Advisor

"Master Copy of Melanie Morris', 'Stronger,' C. 1894"

Julia Tentzerakis
Ljiljana Obradovic-Edmiston, Faculty Advisor

"Master Copy of Paul Cezanne's, 'Curtain, Jug and Fruit Bowl,' C. 1894"

Julia Tentzerakis
Ljiljana Obradovic-Edmiston, Faculty Advisor

"Original Painting: 'Beauty Berries of Wakulla Springs'"

Julia Tentzerakis
Ljiljana Obradovic-Edmiston, Faculty Advisor

"'Treasures of the Forgotten Coast,' Mixed Media Sculpture, 2021"

Julia Tentzerakis
Ljiljana Obradovic-Edmiston, Faculty Advisor

"Original Digital Art Vector Image Printed on Illustration Board"

Julia Tentzerakis
Julie Baroody, Faculty Advisor

"Farewell"

Rose Wharton
Ljiljana Obradovic-Edmiston, Faculty Advisor

1:00-2:00 — Poster Presentations, Student Union Ballroom

"Male Sexual Assault"

Victoria Buchanan
Dr. Renee Gordon, Faculty Advisor

"Observing Factors Relating to Gravity Within Celestial Bodies"

Amber Collinsworth and Sophia Amidi
Dr. Renee Gordon, Faculty Advisor

"The Effect of Climate Change on the Phenology of the Delphinium Nuttallianum"

Connor Couch
David McNutt, Faculty Advisor

"Deep Dive into Anesthesiology"

Emily Huynh
Dr. Renee Gordon, Faculty Advisor

"The Future of Gaming"

Bradley Lashley
Dr. Joseph McNeil, Faculty Advisor

**"The Effects of Climate Change on Bees' Phenology
Observed From the Rocky Mountain Laboratory"**

Zaria Meeks
David McNutt, Faculty Advisor

"The Evolution of Health Monitoring Devices"

Samuel Omeke
Dr. Renee Gordon, Faculty Advisor

"Turning Victims of Sexual Abuse into Survivors"

Delana Sowell
Susan Wessner, Faculty Advisor

"A Parent's Impact"

Breanna Stamper
Michelle Peruche, Faculty Advisor

"Leadership Analysis of Walt Disney"

Journey Toribio
Dr. Nick Vick, Faculty Advisor

"Superconducting RebcO Tape Lap Joint Testing Using Low Temperature Solders"

Audrey Wright
Dr. Nick Vick, Faculty Advisor

2:00-3:00 — Performing Arts and Film, CH 137

"Keely and Du"

Elizabeth Blair and Madison Reed
Dramatic Interpretation
Faculty Advisor: John Schultz

"God Does Not Live on Main Street"

Elizabeth Blair
Dramatic Interpretation
Faculty Advisor: John Schultz

"Dramatic Interpretation — A Line in the Sand, Gina Passalo"

Tiffany Canseco
Dramatic Interpretation
Faculty Advisor: John Schultz

"Prose — Mi Hermanito Perdido, Monica Ruiz Torres"

Tiffany Canseco
Dramatic Interpretation
Faculty Advisor: John Schultz

3:30-4:30 — Reception and Awards, Student Union Ballroom

Presenter Abstracts

*Abstracts are alphabetized by presenters' last names.

THE INTERPRETATION OF MENTAL ILLNESS IN THE VISUAL ARTS

Laney Anderson

Faculty Sponsor: Lindsey Smitherman-Brown, Division of Communications & Humanities

At the start of the COVID-19 pandemic, the Substance Abuse and Mental Health Services or SAMHSA, received over 833,598 calls on their 24-hour hotline. This program run by the US government provides resources to those who suffer from mental illness or substance abuse problems. SAMHSA reported that the number of calls received in 2020 was 27% higher than the year before. With the increase in attention to mental health from the pandemic, the importance and the effects of mental health have never been more important. Many artists are using this therapeutic technique to express their own mental health and as a platform for making the topic more acceptable for conversation and discussion. There are multiple ways to interpret artwork, depending on the perspective. It is the job of each viewer to interpret each piece and create their own ideas about its purpose.

PERCEPTION OF SELF

Emily Avello

Faculty Sponsor: Ljiljana Obradovic-Edmiston, Division of Communications & Humanities

This piece was an investigation into what natural aspects of myself I could realistically portray into a drawing using graphite as a medium. The piece was intended to challenge my abilities and encourage me to test the limits of what I am capable of. This piece is important to me because it is me. The self-portrait is not only a drawing of myself but a glimpse of who I am and what I can do. This piece shows the insecurities I have of myself, which is why I am turned away. The process I took in completing the piece was through a lot of trial and error. I figured out a technique that worked for me, but regardless, there were many times when I was unsure about the integrity of the final outcome. No matter what, I kept on going because I was eager to finish what I started.

KEELY AND DU

Elizabeth Blair and Madison Reed

Faculty Sponsor: John Schultz, Division of Communications & Humanities

The shift in balance of the Supreme Court as well as abortion laws moving forward in several states have women's rights activists worried about the future of Roe V. Wade. Jane Marion's classic play "Keely and Du" immerses us in a world even more terrifying. A world where a woman completely loses her right to choose what happens to her body. In the play, religious zealots kidnap young women seeking abortions and make them carry their babies to term.

GOD DOES NOT LIVE ON MAIN STREET

Elizabeth Blair

Faculty Sponsor: John Schultz, Division of Communications & Humanities

The Epicurean Paradox, or the paradox of good and evil, has been debated by philosophers for almost two-thousand years. This riddle postulates that if there really is an all-mighty God who can control the world, then why do terrible things work themselves into the lives of innocent people? Author Todd Johnson in his book "The World's Religion in Figures" provides data and statistics that indicate a global decline in those who consider themselves religious. Perhaps our accelerating and complex world is literally making the 'leap of faith' too dangerous of a choice.

THE GOLDEN HOUR

Lamoria Brady

Faculty Sponsor: Ljiljana Obradovic-Edmiston, Division of Communications & Humanities

This artwork is an architectural demonstration of the fundamentals of drawing, including perspective, scale, proportion, and value. These basic fundamentals are a vital part of art and must be learned to grow as an artist. Preparation for this drawing included researching different cities and skyscrapers. Research also included how city skylines are affected by sunlight during the golden hour of day. From there, each element was carefully crafted from imagination. Then, several perspectives were tested out to find a unique composition. Once the line drawing was complete, the buildings were shaded using graphite pencils. Several pencils of varying hardness were used to create a contrast in values. Finally, small details such as lighting rods, reflective surfaces, railings, etc. were added for character and diversity.

DARK INSIDE

Devin Box

Faculty Sponsor: Ljiljana Obradovic-Edmiston, Division of Communications & Humanities

This piece showcases portrait of a woman crying with koi fish swimming around her head. The fish swimming represent the mind going in circles, as if her world is falling apart and she is stuck in bad headspace and to represent emotion in this piece I have chosen to draw tears but fill the whole eye black to give the piece depth and contrast. This piece is important to me because through most of my art I like to draw my friends and their emotions at that time because I like to show them that emotions can be beautiful. I started this piece by collaging things together then I took the image and gridded it then used ink to stipple in for details and shadows.

BRANCHES
Racheal Braley

Faculty Sponsor: Ljiljana Edmiston, Division of Communications & Humanities

The purpose of this assignment was to investigate the qualities of line and composition as fundamental aspects of art. The class was instructed to collect a branch and render it as naturalistically as possible using one continuous line and to present it in our chosen composition. I wanted my project to reflect on the subtle complexities of nature by having a variety of branches with different shapes and textures. I began with collecting sticks on my path to class, thus allowing nature to select the content of my drawing. I arranged the composition by beginning in the bottom right corner of the page and allowed the natural progression of the piece to come from the branches themselves. This project allowed me to look more closely at the world and think more critically about the reality of shapes and lines within every object that surrounds me.

CURIOSITY KILLS THE CAT
Lynley Brodbeck

Faculty Sponsor: Ljiljana Obradovic-Edmiston, Division of Communications & Humanities

I created this piece on scratchboard using an x-acto knife. I chose to include a cat, a dead fish, a fern in the corner and a pair of lurking wolf eyes. I wanted to do something that had an overall dark feeling with a hint of mystery. It shows this vulnerable, yet curious cat reaching for this fish it sees, but it doesn't realize it's being lured into a trap. The fish is the lure, shown by the fact that the fish has fishing wire connecting its detached head to the rest of its body. But if viewers follow the wire, it leads to a wolf in the shadows hiding behind a fern. I wanted to leave this piece with the question, "What's going to happen next?" as the cat also doesn't know the answer to that.

MALE SEXUAL ASSAULT

Victoria Buchanan

Faculty Sponsor: Dr. Renee Gordon, STEM Program

In this presentation, the social stigma surrounding sexual assault will be explored in different ways as I was reviewing scholarly material and asking men about their experience with this. This is primarily going to focus on male sexual assault victims, what they go through, statistics of said situations, along with correlation to substance abuse. Many know that sexual assault is a “touchy” subject and the purpose of this presentation is to enlighten and bring many things to light about male sexual assault. Even though both men and women are in danger of sexual violence, society primarily focuses on women’s sexual violence. Men constantly face societal standards and toxic masculinity in everyday life. Sexual assault against men is a social problem because it is linked to gender inequality and common stereotypes. The statistics of sexual assault primarily focuses on women, leading to a disparity in research.

HOW ROMANTIC

Ryan Cake

Faculty Sponsor: Ljiljana Obradovic-Edmiston, Division of Communications & Humanities

Puget Sound On the Pacific Coast was created by the painter Albert Bierstadt who honed his skills at the Hudson River School. This movement highlighted the prodigious in the unexplored. Influenced by the Romantics, the Hudson River School looked to stray away from the ever-expanding industrialization of the world and face a more hyperbolic side of art. I would like to assume that Bierstadt along with the rest of the Hudson River School would find my rendition of the painting appalling. My use of imagery to obstruct this painting was intentionally far from subtle. The positioning of the buildings may be reminiscent of spammed error messages on a computer. Inorganic edges cut into the beauty of the scenery showing the viewer the effect of 152 years of manifest destiny. Yet, the eyes of the viewer will attempt look past the obstacles at the unshackled form of an unconquered monster.

DRAMATIC INTERPRETATION- A LINE IN THE SAND, GINA PASSALO

Tiffany Canseco

Faculty Sponsor: John Shultz, Division of Communications & Humanities

The UN Immigration Agency recorded that as of 2021 the death toll among immigrants to be 4,447, a 35 percent increase since the previous year. Compounded with this heartbreaking number is the amount of deaths that go undocumented. Countless men, women, and children are lost to the desert ultimately succumbing to the sun's heat and dehydration.

Regardless of political opinion when it comes to the official border patrol policies, human decency urges us to address and solve this issue in an effort to curb and eventually eliminate this harrowing statistic.

Por mi gente—because no one should have to die trying to live

Because every number is a person

And every person has a heart breaking story

A line in the sand by Gina Passalo

PROSE-MI HERMANITO PERDIDO, MONICA RUIZ TORRES

Tiffany Canseco

Faculty Sponsor: John Shultz, Division of Communications & Humanities

A March 13, 2021, article from *Deutsche Welle*'s news informs us that one of the most utilized modes of travel to migrate to the United States is on La Bestia—the beast—Also known as the train of death. This news agency estimates that each year between 400,000 and 500,000 people risk their lives on the 1,450 mile journey. This train carries unaccompanied refugee children on its rooftop where they face the danger of gang attacks, dehydration, sun-stroke or simply falling off the tracks. No one knows how many are injured or killed, but *DW* news believes that the number reaches into the tens of thousands. This is for children who dream of being Pedro Pan.

Mi hermanito perdido by Monica Ruiz Torres.

COLOR VALUE PORTRAIT

Camryn Castellano

Faculty Sponsor: Ljiljana Edmiston, Division of Communications & Humanities

This artwork is a painted portrait where one color is used for separating the values and creating contrast by adding dark and light paints. By adding black and white, the viewer is able to distinguish between highlights and shadows. The addition also creates contrast between light and dark. The image shows understanding of realism but only includes simple shades of blue. The light source is taken into account when focusing on the highlights and contour in her face. Positive and negative space were also considered when creating foreground and background. The work was started by selecting a photo and creating line art around all of the major color changes. Then, while observing the original copy, paint was added according to the contour and highlights in her face. This work displays understanding of separating values and using different shades to add contrast and create a final image.

A NIGHT LANDSCAPE OF RUINS

Rhiannon Castillo

Faculty Sponsor: Ljiljana Obradovic-Edmiston, Division of Communications & Humanities

This artwork is a graphite drawing which exercises the practice of multi-point linear perspective. It features an illusory architectural landscape heavily inspired by the likes of Theodor Suess Geisel and M.C. Escher. The visual elements of this piece adhere to separation of value with organic shapes, and maintain reality with the use of shadows and highlights. Keeping perspective and depth consistent were emphasized within the process of creation. The result is a surrealistic abandoned city which takes place in a dream, but may beg the question of benevolence. Upon further reflection, the uninhabitable structures poised in a black background evoke feelings of isolation. The only sign of familiarity is a set of stairs that seem to lead nowhere. The asymmetrical, slightly organic architecture can almost threaten the onlooker with its illogical nature. This take on the universe of Seuss, combined with horror, brings existentialist ideas to the mind's forefront.

THE DIMINISHING NATURE OF GEORGE BALANCHINE'S PHILOSOPHY AND TECHNIQUE

Mackenzie Childs

Faculty Sponsor: Dr. Nick Vick, Division of Communications and Humanities

The purpose of the study was to investigate how Balanchine's principles have rooted themselves in ballet and how those views are changing. This research is important because it helps us to understand how negative ideals were put upon ballet dancers. Another aspect that makes this research important is seeing how one person changes many lives whether it's for worse or for better.

The research was carried out by exploring Balanchine's philosophy and technique. This presentation also includes the consequences that arise from Balanchine's ideals. The last section goes into small dance movements that are surfacing that do not follow the mainstream ideals. Information from over 20 sources was synthesized to carry out this research.

It was found that although Balanchine's ideals are still deeply rooted in large ballet companies, these principles are slowly diminishing. This can be seen through body positive movements in the ballet world.

A CHANGE IN PORTRAITURE DUE TO THE PANDEMIC

Ambar Collazo Cabrera

Faculty Sponsor: Julie Baroody, Division of Communications & Humanities

In the first piece, I painted myself while I was waiting for the bus in Anchorage, Alaska, at the beginning of 2021, and the second piece is my partner while he was at work in Tallahassee Florida, at the beginning of 2022. I decided to do portraits to show the amount of expression there is in the eyes, showing an overall idea of the person's mood and expression, despite the fact that half of the face is covered. Also, it was to demonstrate a change in portraiture where nowadays there will most likely be a face coverage, whether we are at work or outside waiting for a ride. The style was intended to be colorful with minimal blending which was challenging since I usually over blend. So instead, I tried layering color which gave me this animated yet real enough result in texture of hair and contour of skin.

OBSERVING FACTORS RELATING TO GRAVITY WITHIN CELESTIAL BODIES

Amber Collinsworth and Sophia Amidi

Faculty Sponsor: Dr. Renee Gordon, STEM Program

All forms of matter in our Universe are affected by observable factors that lead to a measurable Gravitational Acceleration (g). By researching the qualities of celestial bodies in our solar system, we can collect data on several categories, then compare the effect that these factors have on sourced figures for g and see what levels of correlation do or do not exist. After comparing multiple categories, we were able to rule out irrelevant factors, then make a scientific determination utilizing several methods. With graphs, linear regression, and statistical T Tests, this data is concluded and supported by an additional comparison of the Sourced level of 'g', and a manually calculated value for g using multiple categories that came up in this research as 'highly significant'.

THE EFFECT OF CLIMATE CHANGE ON THE PHENOLOGY OF THE DELPHINIUM NUTTALLIANUM

Connor Couch

Faculty Sponsor: Dr. David McNutt, Division of Science & Mathematics

Phenology is described as the study of phenomena or happenings. Studying phenology allows us to better understand the impact climate change has on the ecosystem and the relationship it has with other environmental changes. The purpose of the study is to explore how climate change affects the phenology of a plant, specifically a *Delphinium nuttallianum*. The phenology dataset analyzed originally came from a team of researchers headed by Dr. David Inouye. They have been sampling the same 30 plots in Gothic, Colorado, every year since 1974. Each plot is sampled twice a week during the summer, and the number of open flowers on each plant in the plot is recorded each time. Based on the analysis of the data, the life cycle of the *Delphinium nuttallianum* has changed, such as the plant started flowering earlier, which leads to a butterfly effect that hurts the survival of organisms and their ecosystems.

HOW DOES PRACTICING GRATITUDE AFFECT MENTAL AND PHYSICAL WELL-BEING?

Katherine Cox

Faculty Sponsor: Dr. Gina O'Neal-Moffitt, Division of Social Science

This paper surveys research studies examining how a grateful mindset enhances an individual's overall well-being. This subject is important because of the empirically demonstrated benefits of practicing gratitude. The studies discussed in this paper investigated how grateful attitudes, when practiced intentionally and deliberately, can lead to stronger relationships, better well-being, and improved quality of sleep and physical health. Among other things, the studies indicate that (i) thoughtful actions make an enormous impact, and often are reciprocated to others; (ii) gratitude is correlated with extraversion, openness, agreeableness, and conscientiousness; and (iii) individuals who practice being grateful feel a greater sense of purpose and satisfaction in life. Although the experiments surveyed demonstrate very compelling findings, they also raise many important questions for future research on ways to improve the physical and mental well-being through a grateful mindset.

ADDICTION TO BEHAVIOR

Joshua Davey

Faculty Sponsor: Dr. Gina O'Neal-Moffitt, Division of Social Science

When discussing the topic of addiction, images of medicine and drugs may be the first things that come to mind. However, addiction can reach us in many different mediums. Addiction to behavior is interesting, seeing as it does not get to directly interact with the limbic system like drugs can. Addiction to behavior comes down to two driving forces: Passion and need satisfaction. Two types of passion can be used in the context of addiction: obsessive passion and harmonious passion. Obsessive passion is the uncontrolled participation in a passion at the expense of other, more important needs. Harmonious passion is the desire to participate, but having the control not to. Obsessive passion is a sign of addiction. Addicts will try to meet their needs in the context of their addiction, but fail to fully meet the need satisfaction. Addictions to technology, gambling, pornography and even exercise addiction were examined.

THE NAILS OF THE CROSS

Parker Edison

Faculty Sponsor: Julie Baroody, Division of Communications & Humanities

This piece is the result of a complex soldering project. I specifically investigated how to incorporate the separate elements of the piece together in a way that is difficult to tell where some aspects were soldered. It is important to me on a personal level because it resembles a necklace my dad gave me in high-school. So the necklace that you see here represents growth from that time to now, it has dents and is beaten and worn, but through that weathering has been made stronger and more refined. I made this using sterling silver, cutting, soldering, and polishing every piece. The horizontal nail is actually two separate pieces of silver that are soldered onto the vertical nail, the seam is impossible to see and the silver "knot" hides any evidence that they are separate.

HOW BORDERLINE PERSONALITY DISORDER CAN SEVERELY IMPACT ONE'S QUALITY OF LIFE AND SELF-IMAGE

Julia Fernandes Bugarin

Faculty Sponsor: Dr. Gina O'Neal-Moffitt, Division of Social Science

Considerably prevalent, it is estimated that up to 6% of the USA population suffers from Borderline Personality Disorder (BPD). A still not fully understood condition, it can be characterized by difficulties in regulating emotions and impulsivity. Those with BPD switch from intense happiness to irritability, shame, and anxiety. They have a poor self-image, an intense fear of rejection and abandonment, turbulent emotions, and difficulty tolerating being alone. The disorder comprises dangerous behaviours, including binge eating, drug/alcohol abuse, unsafe sex, reckless driving and spending sprees. Considering all of this, it is clear that Borderline Personality Disorder is an extremely disrupting and distressing condition, which is still misunderstood. With this in mind, more analysis is necessary to better comprehend it. Therefore, in this research paper, two different experiments were combined. Consequently, making it possible to explore and study the matter further, and investigate how to better the lives of those with BPD.

THE IMPORTANCE OF VIRTUAL REALITY IN THE DEVELOPMENT OF LEADERSHIP SOFT SKILLS

Jugeldi Garcia

Faculty Sponsor: Patrick McDermott, Division of Social Science

Many organizations have been pushed to develop safe and imaginative ways to train their personnel as a result of the rapid advancement of technology. Hands-on learning is one of the most direct and effective ways to learn. As a result, virtual reality is one of the most practical developments for developing soft leadership abilities. Virtual reality gives up a whole new world of immersive learning for emerging leaders, allowing them to gain hands-on experience without the risk of danger or problems. This paper provides an overview of virtual reality for the development of soft leadership abilities for a wide range of audiences, including medical professionals, students, and business leaders. The research discusses what virtual reality is, how it works, and how it has evolved through time. Finally, a discussion is conducted into why a virtual simulation is the most effective way for leaders to be developed in any profession.

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Justin Garcia

Faculty Sponsor: Dr. Renee Gordon, STEM Program

Artificial intelligence systems are used in everyday life, and they learn from human behaviors. With the rise of new technology with the ability to learn on its own, there are newer studies showing the science behind machine learning. Artificial intelligence is utilized in numerous industry which include transportation and law enforcement. From building the code to running the code, there is a substantial amount of time put into programming this “feature”. This research will explain the techniques and logic behind the way AI systems learn on their own by examining the roles of the creator and the end user.

AN ANALYSIS OF METOOCHINA

Allison Grove

Faculty Sponsor: John Schultz, Division of Communications & Humanities

My study investigated how the MeTooChina movement overcomes Chinese censorship in order to spread a feminist narrative. I also compare the MeTooChina movement to other censorship-defying social movements. This research is important because MeTooChina was one of the first instances in which a collective action movement was able to gain momentum online, despite strict Chinese censorship. MeTooChina also gives a model for citizens in other authoritarian states to use in order to spread awareness and enact change. In my project, I used articles from reputable news sites and academic journals in order to examine the MeTooChina movement and its different facets, and compare it to previous movements.

ANGLOPHONE CRISIS

Allison Grove

Faculty Sponsor: John Schultz, Division of Communications & Humanities

In my paper, I investigated the root causes and impacts of the Anglophone Crisis in Cameroon, as well as what the potential options are to help mitigate the crisis. The Anglophone Crisis has killed over a thousand people and over half a million have been displaced. In my paper, I go into how this crisis has the capacity to become much worse. Given that these are the circumstances, it is vital that there is research done on the *why's* of the crisis, as well as discussion on the best steps moving forward. I answer the question of how this conflict came into being, what its impacts are, and how to address it using peer-reviewed research, newspaper articles, and UN and NGO reports.

HOW DOES BEING AN ONLY CHILD AFFECT YOU?

Taylor Hamilton

Faculty Sponsor: Dr. Nick Vick, Division of Communications & Humanities

The purpose of this presentation is to examine the effects of being an only child. This is an extremely important topic because in many places, the number of only child families is on the rise. In China specifically, there is a law limiting how many children an immediate family can have. It is important to understand the psychological effects this has on a person. Many people who grow up as an only child suffer with feelings of loneliness, abandonment, and socializing. It is easy to assume how great being an only child can be when you have one or more siblings that may seem like an annoyance. However, there are proven benefits to having siblings, which is seen as a negative effect on someone who is an only child.

DEEP DIVE INTO ANESTHESIOLOGY

Emily Huynh

Faculty Sponsor: Dr. Renee Gordon, STEM Program

Anesthesiology is needed all around the world. Current research shows that the demand for anesthesiologists is very high. Anesthesiologists play a vital role in assessing a patient's medical readiness before surgery. The purpose for this research is to learn about what it takes to become an anesthesiologist. We research what degrees are needed to step into this field, how much an anesthesiologist will make, what their typical work life is like, and much more. The steps in becoming an anesthesiologist are very important to grasp in order to successfully perform the job. The statistics show how many people pass the specific requirements to become an anesthesiologist.

THE IMPACT OF TELEVISION ON CHILDREN

Alexia Jean

Faculty Sponsor: Dr. Nick Vick, Division of Communications & Humanities

This paper breaks down the effects of television on the young child. This is an issue that has been a highly debated topic for years. Many parents and teachers have had to make decisions as to whether they felt as if television was healthy for their children to consume. This paper analyzes the behavioral and emotional issues that can appear in a child when they decide to pick up a source of media. This is also an analysis of the positive effects of television programs on a child's mind. This analysis addresses studies observing children and their perceptions of reality as they expose themselves to television and the cognitive and experimental factors that may contribute to children's behavioral changes. This paper examines developmental delays, executive function, and television consumption. It will also analyze the role observational learning plays in how a child learns.

Where Engineering and Art Intersect

Kamaria LaPread

Faculty Sponsor: Renee Gordon, STEM Program

On the south side of the Tallahassee area, also stretching into Crawfordville and Woodville is where I'm from. I grew up seeing creative innovation of engineering methods amongst neighbors, family members, and those around the area. During the summer, it is normal for many to bring out their winter projects such as four wheelers made from old pipes and scraps, as well as fixing up electric scooters, or making motorbikes. This area, where I'm from, is known for its massive amounts of junkyards, scrap heaps, and chop shops. Most people can fix a car engine in less than a day in their own backyard, and I personally grew up getting my hands dirty. This visual arts project explores the intersection of mechanical engineering, art, and creating resources others would overlook.

THE FUTURE OF GAMING

Bradley Lashley

**Faculty Sponsors: Dr. Renee Gordon, STEM Program,
and Dr. Joseph McNeil, Division of Science & Mathematics**

Since 1958, video game consoles have become an innovative tool for engineers to explore new technologies. These devices have evolved from tremendously large joystick-controlled systems to nearly 1-pound hybrid touch-based systems. For this project, we will explore how handheld controller gaming has inspired virtual reality (VR) and augmented reality (AR) over recent years. Using this history, we will then explore how the future of these gaming systems might integrate facial, voice, and motion-based recognition controls into their operations. In conclusion, we believe by integrating these technologies, future game development will benefit exponentially from this creativity.

THE EFFECTS OF CLIMATE CHANGE ON BEES' PHENOLOGY OBSERVED FROM THE ROCKY MOUNTAIN LABORATORY

Zaria Meeks

Faculty Sponsor: Dr. David Mcnutt, Division of Science & Mathematics

Pollination of food crops by native bees is critical since they pollinate the majority of the world's flowering plants, including food crops. Bees are at risk of going extinct or changing their phenology as a result of recent climate change, which could affect pollination services. I researched the effects of climate change on the phenology of five native bee species from Gothic, Colorado. In order to analyze the data, I looked at how climate change affected the first day of emergence, the last day of emergence, and the peak number of bees from 2009 to 2018. The results show that climate change is causing bees to emerge and senesce earlier. The peak number of bees varies depending on the bee species. From past research, plants respond to climate change in the same manner that bees do, so ideally it won't have a significant influence on the environment.

IN THE EYE OF THE BEHOLDER

Dean Newman

Faculty Sponsor: Julie Baroody, Division of Communications & Humanities

This piece is a pendent hung on a leather cord. It is a re-imagining of common symbols of protection and nature.

I work holistically. My piece is designed with both form and function in mind; no part is an after-thought.

I love working symbolism into my pieces. I want my jewelry to have a greater meaning to them than just being purely ornamental. I often work with symbolism relating to nature and mythological creatures.

I work in sterling silver. Each element is individually shaped and polished before the whole piece is assembled. This is to ensure that the beauty of the silver is not undermined by minor flaws.

THE EVOLUTION OF HEALTH MONITORING DEVICES

Samuel Omeke

Faculty Sponsor: Dr. Renee Gordon, STEM Program

This project researches the significance of health monitoring devices in today's society. This analysis of health monitoring devices in a variety of styles include: the Oura ring, the Apple Watch, the Samsung Galaxy watch, and the FitBit. The results of this experiment will convey the following: The impact that these devices have had on the medical society, the trajectory for these devices and their potential capabilities in the future, and their impact on individuals' lives. This study is significant due to the fact that these tools or devices are used by almost everyone for their personal health needs, and because it is necessary that we research their impact not only in the medical field but in today's society, as well.

SUNFLOWER SELF PORTRAIT

Rachel Ostrander

Faculty Sponsor: Ljiljana Obradovic-Edmiston, Division of Communications & Humanities

Our final project was meant to be a culmination of what we had learned so far in painting, as well as push us into the challenge of drawing people. Our assignment was self-portrait. We were encouraged to be as creative as possible with how we approached it, especially when it came to the perspective of the painting, and how we depicted ourselves. For my self-portrait, I decided to take advantage of various props I had at home. Using them gave me more ideas for possible poses since I would be interacting with some of these items directly while using others as set pieces. I wanted to mimic older art styles as well with the use of more dramatic lighting and posture for the painting. This allowed me a chance to paint skin texture in more challenging context, and mimicking older styles allowed for me to try different brush techniques.

MONOCHROMATIC OIL STILL LIFE

Kristen Rasmussen

Faculty Sponsor: Ljiljana Obradovic-Edmiston, Division of Communications & Humanities

This painting practices the representation of a set onto canvas by using only one color and its values. This painting involves the study of light and shadows on objects, a mild focus on details and composition, as well as an accurate representation of proportions without grids or guides. It highlights the importance of observation and problem solving - specifically how accurate the eye communicates with the hand and how to incorporate color that otherwise doesn't exist on the set. I started with key measurements for my set, placing the objects appropriately before blocking in the paint. I then carefully observed the difference in colors for each piece, labeling one as saturated, the other as dark, and so on. I went for a soft, hazy feel to the background that allowed for texture and focus on the primary subjects.

THE REALITY OF DANCE

Allie Shimko

Faculty Sponsor: Dr. Nick Vick, Division of Communications & Humanities

I investigated the hard work that dancers put into their training. I wanted to see them focused on gaining strength. This process is important because many don't consider dance a "sport" or that it is difficult. Many don't know what goes on behind the scenes for dancers. I have danced all my life since age 2, and now I am a dance teacher. I feel dancers are also unappreciated for what they do. It is important to show people the hard work that goes into every practice and the struggles and injuries along the way. For my project, I went into a studio and took pictures of dancers from the age of 12 to 18 working on strengthening skills. These pictures captured the dedication they all have and the sweat and tears put into every practice.

BRANCH DRAWING

Katelyn Shuler

Faculty Sponsor: Ljiljana Obradovic-Edmiston, Division of Communications and Humanities

The artwork is a simple drawing of mirroring branches. The work was referenced from a single dying branch, which changed various conditions throughout the process. The art was made using graphite and woodless pencils in various hardness. The art work was originally made with no meaning in mind, it was just an attempt to present a decaying branch in a satisfying way that didn't look like it was haphazardly put together (even though it technically was). Looking back at the process, however, I do believe a deeper purpose can be found. This piece symbolizes finding beauty within the mundane and ugliness. The flaking, insect-eaten branch placed in pleasing symmetry and the simple yet rugged lines gives this piece a balance of formality and informal character. The pleasing placements of an imperfect branch helps bring out the beauty of this simple, insignificant object that would've been overlooked on any other day.

TURNING VICTIMS OF SEXUAL ABUSE INTO SURVIVORS

Delana Sowell

Faculty Sponsor: Susan Wessner, Division of Science & Mathematics

This poster gives an in-depth look into how prevalent child sexual abuse material truly is and what could be used to try and eliminate it entirely. In 2020, Facebook reported 20,307,216 instances of child sexual exploitation on its platforms. All the material was flagged to the National Council for Missing and Exploited Children. However, there is currently no law in the United States that compels platforms to search out child sexual abuse material. The Eliminating Abusive and Rampant Neglect of Interactive Technologies is one bill would allow individuals to sue tech companies that do not take the proper steps to prevent online child exploitation. Most often, the perpetrators of this sexual material of the parental male figures of the victims that are predominately girls under the age of nine years old. Stricter laws should be in place to protect these children and more awareness is key to make that happen.

A PARENTS' IMPACT

Breanna Stamper

Faculty Sponsor: Dr. Michelle Peruche, Division of Social Science

This project is a literature review about the effects that parents' severe psychological disorders can have on their children's psychological and social development. Early intervention for these children was also of interest. The disorders used for the literature review included bipolar disorder type one and type two, unipolar disorder, dysthymia, and schizophrenia. These disorders were selected because of the impact the disorder can have on an individual and their children. The goal of the literature review was to determine what previous research has found regarding the following question: How does a parent's psychological illness affect the psychological and social development of one's children. I used 15 previous studies and found that at least 50% of the children from these families were at high-risk of being impacted negatively, and early intervention is discussed.

"IS ART ESSENTIAL" GIF AND MP4 BY JULIA TENTZERAKIS

Julia Tentzerakis

Faculty Sponsor: Julie Baroody, Division of Communications & Humanities

These videos were created in Foundations of Digital Art and Introduction to Multimedia Design classes, with the objective of investigating an essential element to life. I explored the question, "Is Art Essential?" During the pandemic, many artists took the time in lockdown to demonstrate how art is essential. Historically, art has been a means to capture the essence of cultural norms, events and questions. In addition, art is important worldwide because it is a critical means of expression and can be used as a form of therapy for both artists and viewers. My aim was to create whimsical and inspiring videos. The GIF was created by making the pastel drawing and incorporating photographs of it with animated elements (the bird shapes). The longer MP4 was created using 120 photographs of the drawing as it progressed using Wick Video Editor. The music, "Modern Baroque" is by MaxKoMusic | <https://maxkomusic.com/>.

"EXPRESSION SILVER JEWELRY COLLECTION," 2022

Julia Tentzerakis

Faculty Sponsor: Julie Baroody, Division of Communications & Humanities

The creation of these art pieces investigated the skills of silversmithing, which includes soldering, sawing, hammering and shaping silver, using hand tools and torches. In addition, the development and design of these pieces enabled students to explore their creative and artistic expression. Silversmithing jewelry is important both because it is a centuries old tradition and also because it is a skill that can be used today as a form of artistic endeavor as well as a source of income. The earrings represent a contemporary expression of the peace symbol and the pendant is inspired by the ocean waves that surround Florida. The rings are simplistic in style, representing a departure from designs that evoke excessive materialism, while utilizing the natural element of silver to create an artistic adornment.

**MASTER COPY OF CEZANNE “STILL LIFE WITH APPLES AND A POT OF
PRIMROSE,” C.1890**

Julia Tentzerakis

**Faculty Sponsor: Ljiljana Obradovic-Edmiston, Division of Communications &
Humanities**

The purpose of the Master Copy is to explore how master artists created major works of art in drawing and painting. I chose to copy a Cezanne because I admire his colorful fruit paintings, and it also provides an opportunity to look back in time to a home setting from the 1800s. This activity is important because replicating the works of significant artists is a long-standing tradition that enables students to improve their artistic skills. This project was completed using a grid transfer method and then hand drawing the picture onto paper using pastels in several layers. The final piece is 16 x 20 and realistically invokes Cezanne's original work.

**MASTER COPY OF JOHN SINGER SARGENT’S, “DINNER TABLE AT NIGHT,” C.
1894.**

Julia Tentzerakis

**Faculty Sponsor: Ljiljana Obradovic-Edmiston, Division of Communications &
Humanities**

The purpose of the Master Copy is to explore how master artists created major works of art in drawing and painting. I chose to copy this John Singer Sargent piece because I loved the rich burgundy hues and the light effects created by the glowing lamps. I also like that his work provides a view into a home setting of the 1800s. Sargent was considered the most important portrait artist of his generation. This activity is important because replicating the works of significant artists is a long-standing tradition that enables students to improve their artistic skills. This project was completed using a grid transfer method and then hand painted onto canvas using water soluble oil paint in four layers. The final piece is 16 x 20 and realistically invokes Sargent’s original work.

MASTER COPY OF MELANIE MORRIS', "STRONGER," C. 1894.

Julia Tentzerakis

Faculty Sponsor: Ljiljana Obradovic-Edmiston, Division of Communications & Humanities

The purpose of the Master Copy is to explore how master artists created major works of art in painting. I chose to copy this Melanie Morris piece because I love her painting style of beautiful oak trees in the Southern U.S. Morris is a successful, living abstract and contemporary landscape and still life artist living in Alabama. The study of copying a master artist is important because replicating the works of significant art is a long-standing tradition that enables students to improve their skills. This project was completed by observing the original on a tablet and hand painted onto canvas using water soluble oil paint in two layers over a six-hour period. The final piece is 16 x 20 and although not an intentional 100% copy, invokes Morris' original work.

**MASTER COPY OF PAUL CEZANNE'S,
"CURTAIN, JUG AND FRUIT BOWL," C.1894. 16" X 20"**

Julia Tentzerakis

Faculty Sponsor: Ljiljana Obradovic-Edmiston, Division of Communications & Humanities

The purpose of the Master Copy is to explore how master artists created major works of art in drawing and painting. I chose to copy a Cezanne because I admire his colorful fruit paintings, and it also provides an opportunity to look back in time to a home setting from the 1800s. This activity is important because replicating the works of significant artists is a long-standing tradition that enables students to improve their artistic skills. This project was completed using a grid transfer method and then hand drawing the picture onto paper using pastels in several layers. The final piece is 16 x 20 and realistically invokes Cezanne's original work.

**ORIGINAL PAINTING: "BEAUTY BERRIES OF WAKULLA SPRINGS," 7" X "10.
GOUACHE PAINT ON BRISTOL BOARD**

Julia Tentzerakis

**Faculty Sponsor: Ljiljana Obradovic-Edmiston, Division of Communications &
Humanities**

This painting investigated muted colors using Gouache paint, which can be likened to a richly pigmented watercolor that is used by illustrators. The objective was to create a painting using only two primary colors plus black and white, noting that the primary colors could not be mixed together. This exercise was important because it demonstrated the wide range of values (shades of colors from dark to light) that can be created with a single primary color. This painting was completed using only yellow, red and black and white, noting that the black paint had green undertones, which created olive hues when mixed with yellow. The exercise was also meaningful to me because it was inspired by a photo I took during Photography class at TCC in Autumn, 2022. Beauty Berries are common in North Florida, and as an international student, they will continue to remind me of my time here.

"TREASURES OF THE FORGOTTEN COAST," MIXED MEDIA SCULPTURE, 2021

Julia Tentzerakis

**Faculty Sponsor: Ljiljana Obradovic-Edmiston, Division of Communications &
Humanities**

This study investigated texture in art as part of our 2D Design Class. It is important because texture is one of the fundamental characteristics of art, conveying depth and helping to evoke a meaningful response from the viewer. This sculpture is created with found items from the Forgotten Coast beach near Lanark, Florida. The items include shells, bark, driftwood and a palm frond, all glued to Bristol board and painted an ethereal Phthalo blue, the color of a moving ocean in sunlight. The piece is framed in a floating wooden box. I came to TCC via a stay on the Forgotten Coast in the winter of 2020 and fell in love with the rural beach coastline and the serenity of this part of Florida. This work is also important to me because it is reminiscent of a time before pollution invaded our oceans and beaches.

ORIGINAL DIGITAL ART VECTOR IMAGE PRINTED ON ILLUSTRATION BOARD

Julia Tentzerakis

Faculty Sponsor: Julie Baroody, Division of Communications & Humanities

This piece was designed to honor Rosa Parks and her legacy of standing up for equal rights. Her strength and message are still powerful and meaningful today. The purpose of this exercise was to learn how to develop a Vector portrait using Inkscape software. This study was important as Vector images are a key form of digital art that has the benefit of being able to be developed into extremely large printed images. Vector designs are created using paths comprised of mathematical formulas, which enable a vast scale potential, versus raster images, that are comprised of pixels that can only be enlarged to a certain point before becoming blurred. I sourced the design from an original, mid-20th century photo and created the vector shapes to replicate Ms. Parks' image. The cheerful blue background echoes the shapes that make up the portrait and are meant to inspire hope.

THE CORRELATION BETWEEN BEER AND YEAST CULTIVATION AND THE RISE OF CIVILIZATION

Amiri Thorpe

Faculty Sponsor: Dr. Nick Vick, Division of Communications & Humanities

This presentation examines the correlation between beer and yeast cultivation and civilization. Civilization is the source of most of our major accomplishments and showcases what cooperation of our species can do. However, little is known about the origin of human civilization and is surrounded by theories from countless different cultures. Searching for the origin of civilization could help us understand more about human nature and give answers on how to improve the current ones. The presentation will showcase evidence on how prehistoric humans develop civilization to cultivate specific yeast species to produce beer. It will also compare the counter evidence found on the topic and determine if the claim presented is in fact true. This presentation ultimately hopes to give answers to this old, asked question and illuminate prehistoric humans' past.

“SAVE THE BEES” – EFFECTS OF URBANIZATION AND LOCAL HABITAT CHARACTERISTICS ON BEES IN TEXAS

Sarah Toole

Faculty Sponsor: Dr. David McNutt, Division of Science & Mathematics

Understanding the impact of different environmental elements on the bee population is vital as bees are pollinators and, therefore, critical to crop growth and human food consumption. My study proposes to, over five years and across fifteen cities in Texas, evaluate the effects of urbanization and local habitat characteristics on bee diversity/richness and bee overall population abundance, measured by the distance of resources from the bee nests, the number of available resources, and amount of construction (development). The anticipated results would be consistent with the effects of urbanization and local habitat characteristics, with fewer female bees, a decline in the overall abundance of bees, and a decline in species diversity/richness. Any future work should focus on reducing the environmental impacts of urbanization and aiming to protect the bee population by providing human assistance if needed.

LEADERSHIP ANALYSIS OF WALT DISNEY

Journey Toribio

Faculty Sponsor: Dr. Nick Vick, Division of Communications & Humanities

The purpose of this study is to analyze and distinguish the leadership style of Walt Disney. The reason I completed this study was to analyze and distinguish the leadership style of one of the most well known and successful leaders in American history. This information provides the skillset and characteristics needed to become a successful leader.

I did this project by researching the different events in Walt Disney's life that led him to opening the Disney Brothers production company and creating some of the most well known movies and theme parks in the world. By analyzing these events and what he did during the rise of Walt and his brother's company, we can observe the leadership of Walt Disney.

FAREWELL

Rose Wharton

Faculty Sponsor: Ljiljana Obradovic-Edmiston, Division of Communications & Humanities

Farewell is a soft pastel altered master copy of a painting titled "saying goodbye" by Rapheal Soyer. This painting first caught my eye because of the woman figure in the foreground; I was immediately enthralled by her sadness. I could relate the painting back to my personal life, and so I felt the deep desire to do an adaptation of the original work. I chose to isolate the woman by getting rid of the train in the background. I felt that the woman without the context of a train leaving behind her brought out stronger emotions within my drawing.

SUPERCONDUCTING REBCO TAPE LAP JOINT TESTING USING LOW TEMPERATURE SOLDERS

Audrey Wright

Faculty Sponsor: Dr. Nick Vick, Division of Communications & Humanities

Under cryogenic temperatures, REBCO (Rare Earth Barium Copper Oxide) superconducting tapes yield 0 resistance and create strong magnetic fields. A process that was used in the MagLab's 32T magnet includes overlapping two REBCO tapes to connect them, called Lap Joints. The purpose of this study was to consider using solders with lower melting points and clamping fixtures to salvage the superconductivity of the fragile tapes. This would be relevant in applications that would require re-using REBCO tapes that are in a fixed position, such as repeated tesla coil testing.

We isolated the best connection process to create REBCO tape lap joints using re-used tapes based on resistivity, durability, practicality, and reproducibility. Lap joints varying in overlap width and connection method were tested in liquid nitrogen and measured for their resistances. Results concluded that both soldering and clamping with 100In were possible methods for repeated lap joint testing.

Acknowledgements

The 2022 Symposium on Undergraduate Research is the capstone event for Tallahassee Community College's Undergraduate Research Program, which is now in its fourth year. Hosting an academic symposium is a significant undertaking, and it would not be possible without the dedicated work of the program's coordinators.

This symposium and all other activities of the Undergraduate Research Program are coordinated by TCC's Undergraduate Research Council, an interdisciplinary group of faculty and staff who volunteered their time and efforts toward making this year's symposium a success. A tremendous debt of gratitude is owed to them.

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A very special word of thanks is owed to our sponsors. This year's Undergraduate Research Symposium would not have been possible without the continued support of the TCC Foundation. Their generous support provides funding for refreshments, production of publicity materials, the printing of high-quality full-color posters, and the cost of printing this booklet. We are so grateful to all of the TCC Foundation's generous donors for their support of this worthy cause.

Special thanks are also due to Emily Avello for the use of her drawing, titled *Perception of Self*, which graces the cover of this booklet. This drawing is one of the many fine entries submitted for this year's symposium.