Scholarship Sewanee 2026

Abstract Booklet

Friday, April 24

Contents

1 Oral Presentations **2**

1.1 International and Global Studies 2
1.2 Life Sciences and Environment 8
1.3 Visual Art 12
1.4 Spanish 14
1.5 Social Science 16
1.6 History 18
1.7 English and Classics 22
1.8 Art History 23

2 Poster Session **26**

Posters with the **(SPARC)** designation are candidates for the *Student Projects in Activism, Research, and Creativity* award.

Oral Presentations

International and Global Studies

Location: Spencer Hall 172

Greener Pastures: Maasai Resilience in The Face of Fragmented Landscapes
Paula Diaz Faccini
Department of International and Global Studies, The University of the South, Sewanee, TN
Faculty Sponsor: Emmanuel Asiedu-Acquah

Today, indigenous communities are facing disproportionate rates of displacement. These patterns are deeply rooted in colonial legacies of land dispossession that have historically restricted access to ancestral territories, mobility, and resources. In Kenya and Tanzania, Maasai communities practice pastoralist livelihoods. In the Maasai context, pastoralism is not just an economic strategy, but rather the center of identity, spirituality, and social organization. In the past, these systems have functioned through communal land ownership based on the foundational Maasai principles of respect and reciprocity, enkanyit and osotua, promoting Maasai resilience in a semi-arid climate. However, land fragmentation and privatization driven by neoliberal policy are undermining communal land ownership and reducing the adaptive capacity of local mobilities by constraining mobility. In the face of fragmented landscapes, Maasai communities display resilience through cultural, social, and economic adaptations. Through an interdisciplinary qualitative analysis, this thesis examines how neoliberal land reforms reshape Maasai pastoralist livelihoods in Kenya and Tanzania, producing new forms of dispossession and inequality. By incorporating David Harvey's framework of neoliberalism as "accumulation by dispossession" and Anna Tsing's concept of friction, I will argue that in the Maasai context, neoliberalism is a spatial project that reorganizes land, mobility, and governance to facilitate capital extraction. However, these neoliberal pressures do not simply override pastoralists' culture, but are continuously translated, reshaped, and resisted through Maasai cultural values and adaptations such as re-commoning of land, diversification of livelihood, and the formation of new cultural reinterpretations.

The Far-Right, Right Here: The AfD's expanding appeal to German Voters after the Zeitenwende
Dylana Najera Rios
Department of International and Global Studies, The University of the South, Sewanee, TN
Faculty Sponsor: Claire Panetta

This thesis examines contemporary far-right German politics with a focus on the party Alternative für Deutschland's (Alternative for Germany, AfD) voter support. The AfD is an anti-immigrant, strongly opposed to NATO and the EU, and pro-Russian political party. This thesis also examines its relationship with its roots of regional division that allowed the AfD to tailor the Zeitenwende, a pivotal shift in German and European security policy following the Ukraine War, to disillusioned voters. In the context of the East-West divide in Germany, regional skepticism refers to the critical attitudes toward political institutions and policy decisions that differ between eastern and western regions due to their distinct historical experiences. Additionally, the Zeitenwende faced skepticism due to Germany's hesitation in supporting Ukraine, its long-standing reliance on interdependence, and doubts about whether the new approach would become a stable, enduring policy. Given the legacy of these post-World War II divisions and the patterns shown in the rise of the AfD and the instrumentalization of the Zeitenwende, this research addresses three questions in regards to the

sudden emergence of the AfD: What is the relationship between Germany's regional skepticism towards Zeitenwende policy, AfD's 2025 success, and historical divisions reflected in the post-World War II landscape? How has the AfD taken advantage of this relationship and instrumentalized Zeitenwende to build their base, particularly in Eastern states? Bringing forth the terrifying realization, will Germany slip back into its past and repeat its legacy? This thesis argues the following: the AfD has ridden the far-right European wave and strategically used the Zeitenwende foreign policy to further push their political agenda and gain voters in Eastern target areas. Through a mixed-methods analysis grounded in Arjun Appadurai's framework of ethnoscapes, mediascapes, and ideoscapes, this research examines how demographic conditions, mediated narratives, and ideological currents shaped public responses to Germany's foreign policy shift. Quantitative analysis of regional electoral and demographic data identifies correlations between AfD support, population dynamics, and long-standing geopolitical orientations. Complementing this, qualitative content analysis of party communications and media coverage reveals how the AfD strategically reframed the Zeitenwende as a threat to national sovereignty and regional identity. The study demonstrates that the AfD's electoral gains are not solely products of contemporary political discontent but are also embedded within deeper historical continuities that influence regional perceptions of foreign policy. This research uses Appadurai's mediascape, ethnoscape, and ideascape by integrating global cultural theory with empirical political analysis and provides a nuanced account of how far-right mobilization in Germany emerges with the variables of structural regional divides, contested narratives, and, more importantly, the Zeitenwende. By integrating political science, anthropology, and global studies, especially European studies, this research offers an interdisciplinary approach to understanding how shifting geopolitical realities shape and are shaped by cultural, geographic, and technological exchanges. Methodologically, this thesis will compare electoral data from 2025 in West and East Germany and focus on the voters who make up AfD supporters and what they think of the Zeitenwende by using sources such as The Berlin Pulse, the Pew Research Center, the Deutsche Welle, the Global Witness, the American-German Institute, and the social media app TikTok. By centering regional variation, this thesis highlights how foreign policy debates resonate unevenly across domestic political landscapes due to historical scars and how a political party utilized it for voter gain. Keywords: AfD, East and West Germany, Zeitenwende, 2015 Refugee Crisis, foreign policy

Band Aid, Live Aid, and Live 8: A Global Imaginary Turning into Cosmopolitan Action

Abigail Long
Department of International and Global Studies, The University of the South, Sewanee, TN
Faculty Sponsor: Claire Panetta

Between 1983 and 1985, Ethiopia endured a catastrophic famine exacerbated by drought, civil conflict, and harmful government policies. The crisis drew global attention, particularly from musicians Bob Geldof and Midge Ure, who responded by founding Band Aid and later Live Aid. Band Aid's 1984 charity single, "Do They Know It's Christmas?", galvanized public awareness and fundraising, leading to the 1985 Live Aid concerts at Wembley Stadium in London and JFK Stadium in Philadelphia—an unprecedented global broadcast featuring prominent international artists and raising over $100 million for famine relief. Two decades later, Geldof expanded this activist model with Live 8 (2005), a concert series aimed at pressuring the G8 Summit that year and addressing the structural economic inequalities that sustain poverty, especially in Africa. This thesis examines the cultural and political significance of Band Aid, Live Aid, and Live 8, focusing on how these events used music, media, and celebrity influence to shape global awareness of humanitarian crises.

Drawing on interviews, news coverage, concert and documentary footage, and scholarly analyses, it investigates how these events reached an international audience, the tools used, and the media's role. It also asks: What were the lasting impacts and accomplishments of these events? How can they be better understood through the frameworks of cosmopolitanism and the global imaginary? This argument examines Band Aid, Live Aid, and Live 8 through the frameworks of the global imaginary and cosmopolitanism. This thesis demonstrates that these concerts had an evolving global impact. Specifically, Band Aid and Live Aid contributed to the construction of a shared global consciousness, while Live 8 mobilized that emerging global imaginary into a cosmopolitan political agenda.

Do we give up?: Rethinking Indigenous Continuity in a Degrading Amazon Forest

Nahuel Martinez
Department of International and Global Studies, The University of the South, Sewanee, TN
Faculty Sponsor: Emmanuel Asiedu-Acquah

My research project, Do we give up?: Rethinking Indigenous Continuity in a Degrading Amazon Forest, asks: How does environmental and climate degradation affect the continuity of Amazonian Indigenous communities? What do their adaptive relationships with the environment reveal about broader cultural and political survival? I argue that Indigenous continuity is shaped not by static dependence on a "pristine" environment but by the dynamic negotiation of ecological degradation and socio-political marginalization. Their responses—grounded in adaptation, resilience, and resistance—challenge colonial assumptions of environmental harmony and reveal Indigenous knowledge as a living, evolving, and globally relevant body of knowledge. Through this research, I examine the case study of Amazonian Indigenous communities in the context of environmental and climate degradation, exploring the intersections of globalization, the environment, and culture. I distinguish between the two while analyzing them together: climate degradation refers to ecological shifts caused by global climate change, such as rising temperatures, altered rainfall patterns, and increased fire risk, whereas environmental degradation encompasses human-induced harms, including oil extraction, deforestation, mining, and land dispossession. In the Amazon, these processes are not separate but mutually reinforcing. Therefore, this thesis examines continuity as shaped by the combined pressures of climate effects and extractive, political, and economic actions. With a background in Politics, Global Culture, and Global Environment, I approach this project through published accounts of Indigenous oral histories and narratives, ethnographic and anthropological literature that documents cultural understandings of ecological change, analyses of environmental and Indigenous rights policies at both national and international levels, and representations of resistance through the work of local artists and climate activists. Moreover, I will connect these elements with academic literature from political science, environmental studies, anthropology, and human rights scholarship to seek answers to the questions of this research. My goal is not to study people as subjects but to represent them as storytellers of their own worlds and contexts. This is more than a project about endings (it's the opposite); it's about what survives. It offers a rare opportunity to connect myth and memory with current global crises to build shared narratives that can communicate urgency in a way fear cannot. I hope to act as a cultural bridge, carrying these stories forward as an IGS major, as seeds of understanding for a future we must imagine together.

When the World Watches: Recent U.S. elections, European Media and the Amplification of Right-Wing Populism

Elizabeth Donker
Department of IGS, The University of the South, Sewanee, TN
Faculty Sponsor: Emmanuel Asiedu-Acquah

You may have heard the saying before: "the whole world is watching." Well, this is especially true in the case of the three most recent United States elections. But the rest of the world was not just simply "watching" – they were interpreting, analyzing, and translating them into their own local contexts. This thesis seeks to answer two key questions. First, how did European media in France and Britain report on the three landmark U.S. presidential elections of 2016, 2020, and 2024? And second, to what extent does this coverage, particularly in its portrayal of Donald Trump, amplify right-wing populist ideology within Europe? I draw on the concepts of the mediascape and ideoscape from Arjun Appadurai's theory of the -scapes to conduct an exploratory analysis of campaign coverage of the 2016, 2020, and 2024 U.S. presidential elections by four major newspapers in Britain and France – two right-leaning and two left-leaning. In my thesis, I will argue that European media coverage of these U.S. presidential elections—through repeated focus on Donald Trump, crisis framing, and emotionally charged reporting—amplifies right-wing populist ideas and contributes to their circulation across Britain and France. It is important to understand how to navigate the global media landscape and the broader implications of political coverage.

Speaking Through Crisis: Rhetoric, Cooperation, and the Boundaries of Supranationalism

Parker Daly
Department of International and Global Studies , The University of the South, Sewanee, TN
Faculty Sponsor: Claire Panetta

In 2015, the EU, or European Union, faced a sudden influx of 1.3 million refugees coming from war-stricken countries, mainly Syria and Afghanistan. In an effort to quickly respond, the EU established mandatory refugee relocation quotas requiring member states to accept a stated number of refugees into their borders. Rather than producing coordination, these quotas deepened divisions, intensified tensions, and ultimately failed, forcing the EU to shift to a voluntary system. My thesis asks: 1) After the failure of the European Union's (EU) relocation plan, what approach did they take in order to foster coordination and improve functionality among member states? 2) How did their approach reflect an understanding and a shifting sense of their limits as a supranational institution? 3) What does this crisis and the aftermath tell us about the standing and power of supranational institutions, such as the EU, in the twenty-first century? Through a rhetorical analysis of three key communications, I argue that the EU shifted from a top-down, supranational approach toward one grounded in flexibility and diplomacy to foster coordination and cohesion. Taken together, these communications reveal the EU's growing awareness of the limits of its supranational authority and the importance of building trust among member states. By the third communication, I show that the EU strategically stepped back from its supranational ambitions, prioritizing the development of a stronger foundation of cooperation before attempting to reassert their supranational power. In order to make this argument, I will follow the following roadmap: I. an in-depth investigation of the crisis' background, situating it with the broader landscape; II. a discussion of relevant literature on the crisis; III. an explanation of Hooghee and Marks' multilevel governance and coordination dilemma framework; IV. a thorough analysis of the rhetoric of the A European Agenda on Migration, Eleventh Report of Relocation and Resettlement, and

New Pact on Migration and Asylum; V. an application of Hooghe and Marks framework to support my analysis; and VI. a concluding section that blends my findings and invites readers to form their own conclusions.

Corked Colonialism: Wine, Religion, Identity, and Economics in Colonial and Post-Colonial Algeria

Megan Poulos
Department of International & Global Studies, The University of the South, Sewanee, TN
Faculty Sponsor: Claire Panetta

France's colonization of Algeria profoundly shaped many aspects of Algerian society, one of the most notable being the wine industry. Under French rule, and often against the will of the local population, Algeria rose to become the world's leading wine exporter during the 20th century, largely serving the needs of the French market. However, after Algeria gained independence in 1962, the role of wine and alcohol in Algerian society became a highly contested issue, clashing with cultural and religious values. The debate over its place in the nation's identity continues to the present day. Using Frederick Cooper's theoretical framework of "unbounded decolonization," this thesis explores these debates, asking: how do religious beliefs, memory and identity, and economic pressures influence public perception of Algerian wine and the Algerian Wine industry today? What do these variables tell us about the legacy of Algerian identity? Can a product born of colonial exploitation ever be truly reimagined as part of a postcolonial national heritage or will the legacy of domination shadow its place within Algerian identity? I will argue that wine has become a pragmatic compromise: a discreet export commodity, rather than a celebrated, restructured national product.

Universalism as a Facade: How the British Museum Uses Strategic Discourse to Navigate Repatriation

Aiden Taylor
Department of IGS, The University of the South, Sewanee, TN
Faculty Sponsor: Claire Panetta

The British Museum holds more than eight million objects covering two million years of human history, culture, and art, attracting over six million visitors annually. Founded in 1753 as the first free national public museum, it stands as one of the world's most prominent cultural institutions. Priding itself on a wide-ranging collection that spans diverse cultures and historical periods, the Museum asserts itself as a Universal Museum; however, as countries, communities, and cultural institutions around the world increasingly call for the return of artifacts, The British museum has found itself at the forefront of this international discussion surrounding repatriation. This thesis investigates how the British Museum navigates these controversies and debates of repatriation by asking the questions, how does the British Museum address its "contested objects" to the public? What narrative does the museum construct about itself through this discourse? What does this way of framing conversation reveal about the British Museum as a member in global civil society? Drawing on Ronaldo Munck's framework of global civil society and the use of Critical Discourse Analysis, I argue that the museum's selective silences and its inclusive, universal language reflect Munck's idea of a moral masquerade. By using vague and superficially neutral rhetoric, the museum hides its political agenda and presents itself as a compelling leader within global civil society.

Sides of the Same Green Coin: Sustainable Development, Greenwashing, and Identity-Making in Denmark

Anna Lee Puryear
Department of International and Global Studies, The University of the South, Sewanee, TN
Faculty Sponsor: Emmanuel Asiedu-Acquah

In global discourses today, Denmark is lauded as one of the top leaders in sustainability and environmental policy. From urban design, energy sourcing, and waste management, the Danish state remains prominent within global political and cultural spheres as a growing consciousness surrounding climate change and environmental action emerges. However, studies conducted over the past decades through organizations such as the Global Footprint Network have revealed that the Danish demand for ecological resources has consistently and unsustainably exceeded the parameters of what the Earth can regenerate in a year—a demand which continues to put pressure on an already strained global environment. In this thesis, I investigate the disconnect between the global cultural understandings and perceptions of Danish sustainable development and environmentalism, and the green capitalist actions of the Danish state and multinational corporations that contradict these perceptions through greenwashing processes. Furthermore, I explore how these greenwashing processes are directly linked to Denmark's involvement in extractive industries such as mining and agriculture in its neocolonialist relationship with Greenland, and how these have become intertwined with Danish identity-making processes. Over the past few decades, the public image of the Danish state has transformed into one of a leader in sustainable development through the help of shifting media representations and global discourse. In 2009, due to this perception as a sustainable leader, Copenhagen hosted COP15; however, the resulting Copenhagen Accord was found to be lacking and has since then been deemed a failure due to Western bias. Contributing further to this disconnect between social perceptions and the actions of the Danish state, Denmark actively funds extractive industries such as mining and agriculture, while also maintaining a complex, economic neocolonialist bond with the autonomous territory of Greenland. This is due to the territory's rich mineral resources that have high economic value to Denmark because of their use in construction, industry, and agriculture—which have been found to have high environmental impacts, demonstrating a disconnect between social values and actions. Using Arjun Appadurai's framework of the -scapes and disjuncture, and the theory of imagined communities, I argue that the disconnect between Denmark's global standing as a leader in sustainability and its greenwashing practices reflects a complicated situation in which the country relies on extractive industries to generate the wealth needed to promote an image of sustainable development around which Danish citizens center their sense of identity and understanding of Danishness. For sources, I draw on scholarly literature in the social sciences, data sets and economic reports from the Danish state and intergovernmental organizations such as the International Energy Agency (IEA), news media, and field notes from my research when I studied in Denmark.

Remaking Japan's Frontier: Sustainable Development & Rural Revitalization of Hokkaido Prefecture

Jillian Thurston
Department of International & Global Studies, The University of the South, Sewanee, TN
Faculty Sponsor: Emmanuel Asiedu-Acquah

The issue of rural decline is something that developing and developed nations around the world are increasingly facing, in which limited labor, lack of infrastructure, and economic stagnancy threaten the existence of rural communities around the world. Japan serves as a prime example

of this problem. The nation has struggled with rural decline within its borders for the last several decades. As a result of Japan's historical unbalanced growth and industrialization, the country has created a disjunctive landscape in which a majority of the population and economic productivity is concentrated in urban zones, leaving half of all administrative areas in Japan designated as kaso chiiki—significantly depopulated areas. Through various government and community-led development initiatives, Japan has worked to stimulate economic growth and productivity in the periphery regions of territories by attracting foreign investment, tourism, and population settlement via commodification of locality. Now, in the age of climate change and sustainable development, countries like Japan are expected to incorporate sustainable practices within their development policies that ensure economic, social, and environmental needs are balanced. This paper examines Japan's historical attempts at rural revitalization, how the practice is interconnected with theories of sustainable development, and analyzes how current development initiatives in Japan's Hokkaido Prefecture relate to Japan's broader development goals. This is done through the investigation of the Japanese government's Comprehensive Development Plans for Hokkaido Prefecture and analysis of their sustainable development policies. Hokkaido Prefecture was chosen as the case study for this project due to its history of development centered around natural resource extraction and current status as one of the most depopulated regions within the country. Using Yansui Liu's development framework of Poor mountain, Green mountain, Rich mountain, Arjun Appadurai's Scapes theory, and the concept of counterurbanization, this paper argues that Hokkaido is not only on the path of realizing sustainable rural development, but also serves as the "frontier" to Japan's broader national development narrative.

Life Sciences and Environment

Location: Blackman Auditorium

The Effects of Dopaminergic Inhibition on Motivated and Coordinated Movement in the Gray Sea Star

Josh Fairhead, Kara Taylor, Jaden Fetrow, Ellie Vincent, and Chris Shelley
Department of Neuroscience, The University of the South, Sewanee, TN
Faculty Sponsor: Chris Shelley

Echinoderms, such as sea stars and sea urchins, employ hundreds of motile tube feet to perform complex behaviors such as translocation and righting. Previous research has shown that the dopamine receptor antagonist haloperidol at 100 µM can inhibit the righting response (in which the sea star rights itself after inversion) of Luidia clathrata, the gray sea star. To further investigate the role of dopamine in motivated behavior in L. clathrata, we examined haloperidol's effects on movement velocity in response to a food stimulus. We found that food increases movement velocity and that 100 µM haloperidol abolishes this increase. While tube feet can still move in the presence of haloperidol, it may be that the coordination of the tube feet is impacted by haloperidol. We therefore developed an assay that utilizes a laser light plane to accurately visualize tube foot attachment to a substrate and quantified the overall coordination of tube feet during movement in the presence and absence of haloperidol.

Examining inter-individual differences in urgency under speed-accuracy tradeoff

Suzanne Cole, Thomas Reppert
Department of Psychology and Neuroscience Program, The University of the South, Sewanee, TN
Faculty Sponsor: Thomas Reppert

There are limits to our cognitive resources. Our capacity to think, calculate, reason, and make decisions is impacted by factors such as stress, hunger, and fatigue. In today's fast-paced world, one of the most valuable resources is time. Humans naturally aim to maximize reward while minimizing the cost of time, often resulting in a speed-accuracy tradeoff of performance. Reward rate is determined by one's sensitivity to risk, subjective effort needed to complete a task, and decision time required to achieve a desired level of accuracy. We developed a novel perceptual decision-making task to examine inter-individual differences in decision speed. The tokens task requires participants to monitor tokens as they jump randomly from the center of the screen to bins on either side and to judge which container will eventually have the most tokens. Programming a random jump direction for each token naturally results in trial types of varying difficulty levels (easy, ambiguous, and misleading). We manipulated the cost of time to incentivize either fast (high cost) or accurate (low cost) decisions in separate blocks of the task. With limited knowledge of the neural correlates of decision-making, researchers model observed behavioral patterns to test their predictions. In most two-choice tasks, the decision process is modeled using evidence accumulation. During a trial of the tokens task, participants accumulate sensory evidence until they feel confident to guess which bin will have the most tokens. The level of confidence required to reach a decision threshold is believed to be moderated by an internal urgency signal. We plan to use the data gathered from our task to test predictions made by the urgency gating model about the effects of context and difficulty on decision behavior.

Optimizing Fluorescent Reporters for Detecting Insulin Granule Exocytosis in Islet Cells

Mary Courtney Finn 1, Wenbiao Chen 2
Department of Biochemistry, The University of the South, Sewanee, TN 1, Department of Molecular Physiology and Biophysics, Vanderbilt University School of Medicine, Nashville, TN 2
Faculty Sponsor: Elise Kikis

Type 2 diabetes (T2D), the most common form of diabetes, affects millions in the United States and results from the interaction of metabolic stress and genetic susceptibility. Genome-wide association studies (GWAS) have identified over 600 loci associated with T2D risk; however, most of these lie in non-coding regions, making it challenging to pinpoint the causal genes. One approach to determine the effector genes is to genetically suppress those surrounding the loci and assess the consequences on islet cells. Of the 600 loci, roughly 250 are thought to affect islet cells. Our lab plans to screen genes near these loci using CRISPR in human islet cells. Such a screen requires a quantitative measurement of stimulated insulin secretion in individual cells. By expressing a self-labeling protein (SLP) that covalently attached a fluorescent substrate to itself (SNAPf and HALO-Tag) in the lumen of dense core granules (DCG), cell-impermeant substrates should only label granules undergoing exocytosis with varying labeling speeds. We hypothesize that because neuropeptide Y (NPY) is known to be sorted into DCGs, along with a C-terminal transmembrane domain, it will anchor the SLP to the DCG lumen, facilitating the detection of exocytosis. We have generated SNAPf- and HALO-tag-based DCG exocytosis reporters and found that the SLPs are localized in the DCG as expected when expressed in αTC1-6 cells (α cells) and MIN6 cells (β cells) in vitro. Ongoing experiments will determine whether the labeling of these SLPs truly represents

DCG exocytosis, and which SLP is best suited for islet cell secretion. Given the financial and health burden of T2D, our approach aims to help identify key effector genes at risk loci and uncover new therapeutic targets.

Predicting Diamondback Terrapin Occupancy Along the South Carolina Coast: A Geospatial and Bayesian Modeling Approach.

Graham Nystrom, Kristen Cecala
Department of Biology, The University of the South, Sewanee, TN
Faculty Sponsor: Kristen Cecala

Land conversion, habitat degradation, and environmental change converge to create a complexity of challenges for the persistence of the diamondback terrapin (Malaclemys terrapin) on the modern coastal landscape. Here we describe an attempt to model this convergence using observational and geospatial data to find influential environmental parameters for determining diamondback terrapin occupancy in tidal creeks across the coast of South Carolina. We collected occupancy data from a total of 68 sites from 10 regions along the coast and generated a variety of environmental and geospatial data for each site using spatial analysis tools and publicly available datasets in ArcGIS Pro. Using these data, we employed a mixed-effects Bayesian hierarchical modeling approach to narrow in on any significant environmental variables affecting diamondback terrapin occupancy. We produced a global model in which 4 variables – the total area of oyster beds within 150m of a site, the total area of marsh within 150m of a site, the distance to the ocean by navigable waterway for a given site, and the total area of open water within 1.5km of a site – combined to have the strongest effect on predicting diamondback terrapin occupancy across the coast of South Carolina. The by-regional variation in baseline occupancy predictions from the global model seems to suggest that on a regional scale, environmental variables and habitat quality features are most important for determining diamondback terrapin site occupancy. The predictive parameters identified by the global model provide insight into the important habitat features that seem to promote diamondback terrapin occupancy on the coastal landscape.

Examining Mechanisms of Terminal Investment in the Burying Beetle, Nicrophorus orbicollis

Cooper Smith
Department of Biology, The University of the South, Sewanee, TN
Faculty Sponsor: Matthew Schrader

Organisms that reproduce more than once during their life often face a trade-off between investment in current and future reproduction. Natural selection is expected to favor patterns of parental investment that maximize parental fitness in the presence of such a trade-off. For example, the terminal investment hypothesis predicts that as an individual's future reproductive opportunities dwindle due to disease or advancing age, they should increase their investment in current reproductive opportunities, potentially providing more or better care at the expense of future reproduction. In a previous study of the burying beetle Nicrophorus orbicollis, I tested predictions of the terminal investment hypothesis and found that measures of reproductive performance were generally higher for older parents than for younger parents. These results were consistent with the terminal investment hypothesis; however, the mechanisms responsible were unclear. To better characterize these age-related effects, I used a cross-fostering experiment to test whether parental age influenced reproductive success via parental effects occurring before or after larvae hatch. I found that the age of the biological parents affected larval mass and possibly survival from dispersal to eclosion. In

contrast, the age of the caring parents did not affect any of the variables I measured. This suggests that parental age can affect larval fitness through mechanisms that act early in development, before parents and offspring interact.

A Changing Agricultural Landscape: Non-monetary and non-material values of the rural landscape.

Keri Watson, Sarah Grace Burns
Department of Earth and Environmental Systems, The University of the South, Sewanee, TN
Faculty Sponsor: Keri Watson

Across the United States, the farmholder demographic is aging. Coupled with rising land prices and rural development pressure, we expect to see a large turnover of agricultural land ownership in the coming decade. In many areas across the country, including Franklin County, the rural landscape is already changing from agricultural land to exurban housing developments. This land use change has ecological and social implications that will affect the health of farmland and the farming community in these rural areas. While we can see this change happening, it is difficult to predict what the future agricultural landscape will look like. Through semi-structured interviews with farmers in Franklin and Grundy County, we identify and compare farmers' values, pressure points, and aspirations with the goal of better understanding why and how agricultural land use change will occur, and its consequences for farmers. Beyond the material and economic benefits of farmland, we evaluate the non-monetary benefits and relational values farmers hold in connection to the landscape. We hypothesize that these relational values tied to the land are likely to influence land use choices and rural landholders' aspirations for their own land and community into the future. We found that farms, regardless of production style or size, are facing shared pressures of development, increasing land prices, and increasing overall production costs. In response to these pressures, we see farms changing and adapting farming practices through shifts in production systems and scale, among others. We also identify strong relational values that farmers hold across vastly different scales and types of agricultural production, such as sense of identity, spirituality, and bequest values. Furthermore, across farm types, farmers hope that their land will remain agricultural despite the pressures they are facing. In identifying pressures farmers are facing, values farmers hold, and hopes farmers have for the future, we see strong similarities throughout the farming community. Understanding these similarities is instrumental in empowering communities to steer landscape change in the directions they want to see in the future.

Leveraging AI: Does Sewanee's urban forest provide important ecosystem services?

Liz Calabria
Department of Earth and Environmental Systems, The University of the South, Sewanee, TN
Faculty Sponsor: Thomas Powell

Urban forested land cover is crucial for reducing the urban heat island effect and energy use, controlling stormwater runoff, improving air quality, facilitating ecosystem services, and promoting mental health and wellbeing. This project explores forest canopy composition and changes in the rural context of Sewanee, TN. A high percentage of tree cover is an essential feature of Sewanee's landscape, both in the town and the forest. In 1989, Sewanee became a "Tree City, USA." In 2013, the Tennessee Certified Arboretum designated The University of the South's Campus as a Tennessee Certified Arboretum. As Sewanee's population grows, there is an unmet need for affordable housing, necessitating further development affecting tree canopy cover. It is important to understand the extent of change in tree canopy cover alongside its associated affects, such as temperature changes.

This project utilizes uTREE, a new platform launched in partnership with Purdue and National Science Foundation that uses artificial intelligence to gather data regarding tree density, species, location, and changes in tree counts over time and events. It is a multidisciplinary tool that aids in urban forest management and understanding. The project incorporates Sewanee, TN into the greater network of cities involved with uTREE to provide tree locations, species identifications, and monitoring to aid in the development of urban planning scenarios and management plans. Preliminary analysis includes analyzing the effect of different crown cover scenarios on surface temperature and ecosystem services.

Visual Art

Location: Convocation Hall

These are my Friends!
Roman Belton
Department of Art, Art History, and Visual Studies (Art), The University of the South, Sewanee, TN
Faculty Sponsor: Jessica Wohl

This presentation will examine childlike imagination and sophisticated construction through a playground full of rainbow animals and food made in soft sculpture. The use of fleece, beads, and foam bring a welcoming world to life. This work displays how craftsmanship can turn childhood art materials into completely new and disarming creatures. Completely unreal colors make the pieces both attractive and overwhelming. This work subverts masculine symbols, like a deer ready to be hunted or a giant, greasy hamburger, by making them feminine and soft. A wedding cake becomes a friendship cake, celebrating the special connections in our lives that are not romantic. Connections to the LGBTQ+ community are prevalent, influencing the work in surprising ways. These pieces do not ask for approval: they exist proudly and take up space. The works balance softness with intentional and forceful levity to inspire audiences to embrace their most vibrant self.

Flesh Without Blood: Cradling Roadkill and Fictionalizing the Body
Audrey Hoffman
Department of Art, Art History, and Visual Studies (Art), The University of the South, Sewanee, TN
Faculty Sponsor: Jessica Wohl

Representations of internal tissues removed from the context of the body and dead animals on the side of the road may be perceived as violent or upsetting. This thesis considers these visuals through an alternative lens, using this potentially harsh subject matter to explore ideas of embodied experience and empathy. The paintings in Flesh Without Blood use oil paint for its ability to create a realistic, seemingly enterable space, while engaging with the historical usage of portraiture for honorary and memorial purposes. Other works utilize wax sculpture and textiles to create physical manifestations of the body as art objects, simultaneously visceral and precious. This presentation incorporates elements of Women's and Gender Studies alongside Art, considering an embodied, nurturing relationship between presumed human and nonhuman bodies. Compositionally referencing 19th century hairwork, portrait miniatures, and postmortem photographs, the portraits in this work reconsider the disposability of animal bodies. Utilizing the language of embroidery and hyperreal wax sculpture, the fleshier works consider the internal tissues of the body as a source of

fascination independent of their utilitarian function. In conversation with each other, these bodies of work explore what formal elements make a subject, object, or surface feel alive.

half return
Savannah Brister
Department of Art, Art History, and Visual Studies (Art), The University of the South, Sewanee, TN
Faculty Sponsor: Jessica Wohl

Despite creative, written, and oral documentation, personal and familial histories change and fade away with time. This presentation will explore the ways in which these strange pasts interact with grief and longing. Referencing personal film and smartphone images and videos from the 1970s to 2021, the thesis questions documentation and memory alike. Ball point pen, colored pencil, pastel, stitching, and projection create fragile objects that change with time. Small works, layered materials, limited colors, and negative space form distance from moments and objects that are nearly tangible. These distorted images construct disconnected narratives. With influences such as David Lubin's theory of home videos as mementos mori and Larry Sultan's artwork, this thesis reflects on these personal objects and what they may or may not present. Through a sense of absence, this body of work asks viewers to question the impact of unknown histories.

Fragments of Love and Pain: An Exploration of Grief and Empathy
Sunny Bowers
Department of Art, Art History, and Visual Studies (Art), The University of the South, Sewanee, TN
Faculty Sponsor: Jessica Wohl

Fragments of Love and Pain describes the sensory experience of being human as we relate and interact with our surroundings, other beings, and ourselves. This body of work begs people to understand their crucial role in creating a more loving and empathetic world, not only for oneself but also for others. Can this be achieved through engaging in acts of empathy found within vulnerability? This work combines large-scale painting with improvised violin sound sculptures, as well as drawing with violin and guitar music, to create an immersive experience that expresses the overwhelming nature of being. The auditory pieces animate the narrative of my visual works making it performative and blur the separation of the reality we experience and the imaginary reality that exists within the work. The inclusion of nude female bodies, cows, intense color palettes, dripping paint, and unstructured sound sculptures create friction between beauty and discomfort. This presentation examines anxiety, grief, existentialism, power dynamics, and the female body, inviting the audience to consider what is valuable about being human and reflect on how to bring more empathy to a world where it is lacking.

The Space Between
Sally Whitehead
Department of Art, The University of the South, Sewanee, TN
Faculty Sponsor: Greg Pond

This body of work explores duality through both video and photography, focusing on how our internal thoughts shape external perception and effect the way we exist in the world. The video work, comprised of a three part video series, looks at the ways in which mental health can influence

our perception of reality, using humor and absurdity to show how anxiety, pressure, and inner conflict can shift how we experience the world around us. Through repeated imagery and dark humor, the work makes otherwise invisible internal feelings tangible to the external world. The photographic sequence explores a different but connected duality, focusing on how the roles we take on, in this case being an athlete, shapes the way we interact with the world around us. Athletics and art are often seen as opposites, but this work brings them together by looking at sports through an artistic lens. By reframing athletic moments, the work highlights the beauty within sport, showing that athletics and art are not as separate as they seem. Together, both works show how our interaction with the world is shaped through internal struggles and external roles, revealing how both constantly influence the way we exist.

Spanish

Location: Spencer Hall 151

La representación de la perspectiva indígena en documentales sobre extractivismo en la Amazonía ecuatoriana.

Samantha Ude
Department of Spanish, The University of the South, Sewanee, TN
Faculty Sponsor: Arturo Marquez Gomez

La Amazonía ecuatoriana es un ecosistema biodiverso en el que habitan varios grupos indígenas. Este lugar ha enfrentado muchas empresas que buscan aprovecharse los recursos naturales abundantes de esta zona. Este extractivismo tiene efectos extendidos en los pueblos indígenas por la proximidad entre las zonas en las que habitan y los sitios de extractivismo. A lo largo de los años, estos grupos han perdido los derechos para regular el proceso. Esta tesis examina cómo los documentales Los descendientes del jaguar (2012) de Eriberto Gualinga y Adelante Petroleros: The Black Gold of Ecuador (2013) de Maurizio Zaccaro representan el medio ambiente y su extracción en los territorios indígenas. Para mi análisis, me baso en las ideas de Helen Hughes quien en su libro Green Documentary (2014), define tres categorías de documentales ambientales - contemplativo, irónico, y argumentativo. Mi objetivo es clasificar estos documentales de acuerdo al uso que hacen de elementos como la voz en off, las entrevistas, y el material de archivo para retratar su perspectiva del extractivismo, el medio ambiente, y los indígenas. A diferencia de la amplia diversidad de investigación sobre los efectos ecológicos en el medio ambiente y la biodiversidad en Ecuador, sobre todo en el caso Texaco/Chevron, mi tesis investiga la forma en cómo se representa la perspectiva de los distintos grupos indígenas en relación con el estado y las empresas. Esta representación tiene que ver con las diferentes perspectivas que los indígenas han desarrollado históricamente con las empresas de extractivismo y el estado.

Trabajo en Crisis: Neoliberalismo y Cultura Audiovisual en España Contemporánea

Maren Johnson
Department of Spanish, The University of the South, Sewanee, TN
Faculty Sponsor: Arturo Márquez-Gómez

Esta tesis analiza los modos en los que la cultura audiovisual, particularmente el cine español contemporáneo del siglo XXI representa las experiencias y desafíos de los trabajadores dentro de un sistema y sociedad neoliberal marcado por la crisis económica del año 2008. Mi análisis se centra en los filmes post-crisis financiera: el documental En tierra extraña (2014) de Icíar Bollaín, y el filme

de ficción La mano invisible (2016) de David Macián. Bajo el concepto de el 'cine de la austeridad', acuñado por Víctor Álvarez-Rodríguez en el 2021, analizo cómo estos filmes narran las versiones alternativas del campo laboral post-crisis: las personas que emigraron a otros países y las personas que se quedaron en España. Ambos filmes representan el mundo de trabajo en España después de la crisis financiera de 2008 que resultó en una alta tasa de desempleo en grupos como jóvenes y personas con educación universitaria. Estas obras cinematográficas revelan dos perspectivas de la crisis; las del grupo que se queda en un sistema neoliberal con menos oportunidades, y las del grupo que se muda a través de la Unión Europea para encontrar trabajo. Al mostrar diferentes visiones del trabajo y del contexto socio-económico en el cual se desarrolla, estos filmes reflexionan sobre la historia del trabajo en España desde la dictadura de Franco hasta la actualidad. Ambos filmes establecen una fuerte crítica a los discursos progresistas de la Unión Europea y al hacerlo proponen una visión multidimensional del trabajador/a sus tribulaciones y éticas que se adaptan en medio de las oscilaciones del mercado actual.

Una Travesía Solitaria: Narrativas Sobre la Migración Infantil en la Frontera del Sur de Estados Unidos.

Daphne Nwobike
Department of Spanish, The University of the South, Sewanee, TN
Faculty Sponsor: Arturo Márquez Gómez

La migración de menores de edad ha sido un aspecto fundamental de la historia de la humanidad y, por ende, de los Estados Unidos. Los inmigrantes históricamente han provenido de distintos países y han llegado después de travesías que el arte ha documentado por siglos. La migración desde México y Centroamérica ha recibido mucha atención y escrutinio mediático como problema social marcado por la atención del gobierno de los Estados Unidos desde principios del siglo XX. Los discursos mediáticos y políticos sobre los y las niños/as migrantes, especialmente los que migran sin sus padres o cuidadores, han sido escasos. Con frecuencia, estos discursos reducen a estos niños/as a cifras, estadísticas y terminología judicial. Al invisibilizar y al reducir este fenómeno, no se presta atención a las condiciones y motivaciones que llevan a muchos niños/as a realizar estos peligrosos viajes. Tanto el cine como la literatura han sido vehículos de expresión íntima y emocional sobre los procesos de migración. ¿Cómo el arte se ha acercado a este fenómeno social, histórico, económico y cultural? ¿De qué formas la literatura y el documental representan este tema? ¿Qué nuevas dimensiones o aspectos de la infancia migrante ofrecen la literatura y el documental? Mi tesis indica que la literatura y el cine contribuyen a la humanización de la experiencia migratoria y constituyen medios para captar la atención de las audiencias y generar conciencia entre las autoridades, generando una mayor comprensión de la infancia migrante. Mi trabajo analiza el testimonio autobiográfico de Javier Zamora en su novela Solito (2022) y el documental Which Way Home (2009) de Rebecca Cammisa. En mi análisis de estas obras me centro en cómo los autores construyen narrativas que, a través del uso de la primera persona y del testimonio en la novela y de las entrevistas en el caso del documental, acercan a la audiencia a una comprensión holística de la infancia migrante. Ambas obras ponen énfasis en construir relatos que consideren los factores que explican la migración, el peligro y los riesgos del proceso y el trauma y la resiliencia de los niños migrantes. De esta manera, estas narrativas desarrollan una perspectiva humanizante de los/las niños/as. Este trabajo pretende contribuir a la discusión en torno a la infancia migrante, ya que escuchar y legitimar sus narrativas contribuye a preservar su dignidad y aumentar la conciencia pública sobre este fenómeno migratorio.

Social Science

Location: Spencer Hall 164

Planning for Disaster: How Gulf Coast States Land Use Plan for Natural Disasters

Annie Steinfeld
Department of Politics, The University of the South, Sewanee, TN
Faculty Sponsor: Patrick J. Gauding

This study examines how institutional rules shape local disaster governance in Gulf Coast counties. Gulf Coast states are faced with high natural hazard exposure and low disaster planning standards (Berke et al. 2014; Berke, Smith, and Lyles 2012). Using the Institutional Analysis and Development (IAD) framework, I study how formal rules and community norms interact to influence the content of county-level disaster plans. I conduct a directed qualitative content analysis on the comprehensive plans (voluntary growth management plans) and hazard mitigation plans (FEMA required hazard-centric plans) for the 113 NOAA-designated Coastal Zone counties on the Gulf Coast. I code each plan for integration with the American Planning Association's Principles for Sustaining Places, distinguishing between Tier 1 (structural) and Tier 2 (operational) levels of integration. My findings suggest that comprehensive planning is more prevalent in states with more county-level regulatory authority, and comprehensive plans include more structural actions than hazard plans. Overall, states with lower county-level authority have fewer overall action mentions due to lack of voluntary planning—resulting in mandatory and operational plans rather than voluntary and structural. These results suggest that institutional choice rules-in-use limit the ability of local governments to engage in voluntary or preventative disaster planning. The study contributes to understanding how institutional design mediates local resilience capacity and highlights the need for tailored governance reforms in low county authority states facing escalating climate risks.

Experiencing Social Death in the Sahel: Investigating the Effects of EU Border Policy and Regime Change on Forced Migrants

Owen Whitney
Department of Politics, The University of the South, Sewanee, TN
Faculty Sponsor: Amy Patterson

After Europe's 'immigration crisis' of 2015, immigration has become a central political topic that has manifested in socio-political questions regarding border security and national identity. During this period, European states have seen the support for populist, anti-immigration politicians surge. The literature shows that high migrant-receiving states have pushed borders past demarcated territory in an attempt to decrease entrances and asylum claims, and calls this policy "border externalization." Current migration literature struggles to examine the Sahel region of Africa despite its high frequency as a migrant path, the effects of these policies on individual forced migrants through qualitative study, and military regimes' responses to such policies. My study adds to the literature by addressing these gaps. I use a mixed methods approach in which I use data on EU border policies and Sahelian military regimes, and qualitative analysis of coded migrant testimonies and reports, to investigate border externalization policies in the Sahel, the introduction of military regimes in the region, and the effects of these events on forced migrants in the form of social death. I find that the introduction of military regimes and a decrease in border externalization are associated with an increase in social death among forced migrants in the Sahel region. My findings indicate that the transition in regime from civilian to military, and the ensuing decrease in border externalization policies, in the Sahel led to increased physical and emotional harm felt by forced

migrants.

Between Punitive Policy and Restorative Practice: Policy Implementation in Tennessee's Disciplinary Alternative Schools

Hannah DeGuira
Department of Department of Politics, The University of the South, Sewanee, TN
Faculty Sponsor: Cecilia Cerja

Disciplinary alternative schools serve students who have been expelled from traditional schools for disciplinary infractions; however, research has revealed equity disparities for alternative school students. Despite their importance, alternative schools are underexamined in education policy research and governance. In my honors thesis research, I address the limited attention to alternative education policy by examining the political dynamics that shape disciplinary alternative schools in Tennessee with the help of funds from the Gessell fellowship. Using qualitative research methods, I conducted a case study of Franklin County, Tennessee, which has one alternative school. Drawing on semi-structured interviews with teachers, administrators, school board members, and community members, this study analyzes how disciplinary policies are interpreted and implemented on the local level. Findings reveal that while the Franklin County Alternative School appears to have sufficient county support, perceived state support is low. Moreover, the Alternative School and broader county have been significantly impacted by zero-tolerance policies– shaped by federal reforms such as the No Child Left Behind Act– particularly in relation to substance use-related infractions. Interview participants also emphasize the importance of restorative practices, teacher-student relationships, and flexibility in addressing student behavior issues for academic achievement in alternative schools. These findings reveal a tension between the state's punitive policies and schools' restorative goals. Nonetheless, Franklin County teachers and administrators have adapted restorative practices in the wake of increasing punitive measures. This study reveals a gap between education policies and policy implementation in Tennessee. By situating disciplinary policy within broader education policy, this study highlights the need for education and disciplinary policy reform at the state and federal levels.

Institutional Gender Equality and Economic Growth

Ally McCasland
Department of Economics, The University of the South, Sewanee, TN
Faculty Sponsor: Tao Song

This thesis examines which institutional protections of women's rights are most essential for economic development. Using country-level panel data from 1981 to 2011, derived from the CIRI Human Rights dataset and the World Bank's World Development Governance Indicators, this research estimates fixed-effects regressions where the dependent variable is the natural logarithm of GDP per capita (controlling for purchasing power parity). The model included measures of women's economic, political, and social rights as the variables of interest, controlling for lagged GDP per capita, savings rate, tertiary enrollment, and the effective depreciation rate as specified by the Solow model. Results show that the enforcement of women's political and social rights is significantly positively associated with growth. Economic rights, conditional on political and social rights or exercised alone, have no significant effect on economic development. The research finds institutional gender equality is not only a matter of equity but also a catalyst for economic growth.

The Effect of Air Pollution on Infant Health: An Empirical Analysis
Shane Flannery
Department of Economics, The University of the South, Sewanee, TN
Faculty Sponsor: Tao Song

This study examines the relationship between various air pollutants and the postnatal rate of infant mortality. My study involved analysis of postnatal infant deaths, spanning from 2005-2019 with data from the CDC linked birth / infant records and nonattainment / attainment status pollutant data from the EPA. Total postnatal mortality rates were evaluated using a fixed effects, multi-pollutant model. Counties in nonattainment for PM2.5 (exceedant levels of pollutant) have a 0.248 higher death rate per 1,000 live births, compared to counties in attainment for PM2.5. Additionally, counties in nonattainment for O3 have a 0.423 higher death rate per 1,000 live births, compared to counties in attainment for O3. This suggests that higher levels of PM2.5 and O3 are associated with risk of postnatal mortality.

History

Location: Torian Room

Recipes, Herbs, and Midwifery Manuals in the 17th and 18th Century
Grace Willerson
Department of History , The University of the South, Sewanee, TN
Faculty Sponsor: Andrea Mansker

In seventeenth and eighteenth century England, women were still creating and passing down medical and reproductive knowledge even as male physicians were trying more and more to take control over the female body. Midwifery manuals written by women like Jane Sharpe, Sarah Stone, Elizabeth Nihell, Margaret Stephen, and Martha Mears, along with herbal books, recipe collections, and domestic medical guides, make it clear that women were not just patients. They were practitioners who learned through experience, observation, and knowledge that had been passed between women for generations. Much of this knowledge survived in handwritten recipe books, in the training of midwives, and in the use of herbal remedies that were often described through careful phrases like "bringing on the courses", which allowed women to share information while still protecting themselves. At the same time, male authored medical texts relied heavily on this knowledge even as they tried to control it through print and claims of scientific authority. Instead of a story about women losing authority because their knowledge was unscientific, these sources show a long struggle over power, credibility, and who had the right to speak about the female body, while domestic medicine continued to exist as a complex and deeply rooted system of knowledge.

Mothers of Equality: Maternalism and Racial Divides in the Southern Suffrage Movement
Hunter-Nicole Jolley
Department of History, The University of the South, Sewanee, TN
Faculty Sponsor: Andrea Mansker

The fight for women's suffrage was one of the longest and most grueling campaigns for equality in the history of the United States. Over the course of the campaign, feminist leaders constructed and employed various strategies to garner support for a woman's right to vote. My research focuses on the role of maternalist politics, analyzing how rhetoric surrounding motherhood was used to

convince southern constituents of the need for universal suffrage. Southern values pertaining to motherhood developed from the Antebellum age, where white landowning women stood as symbols of hospitality, virtue, and humility. Because southern society so highly valued motherhood in this way, it became a natural framework for women's rights activists to justify their political engagement and the fight for universal suffrage. However, it was not truly universal. Black women were largely excluded from political organizing, and the issue of enfranchising the African American community became a key controversy within the suffrage movement. Through my paper, I seek to answer a) how the idealized southern mother came to fruition in the Old South, b) how this concept largely excluded black southern women, and b) how Black women activists constructed their own meanings of motherhood, including how this meaning was rooted in the social conditions of the time. My research will span primarily from the early Progressive Era to the ratification of the nineteenth amendment (roughly 1880-1920), with some attention given to the continued struggles faced by black women in the years following, due to the fact that full enfranchisement would not be achieved until the 1965 Voting Rights Act. I will reference a variety of secondary sources including three that are central to my argument– Lifting As We Climb: Black Women's Battle for the Ballot Box by Evette Dione, Mothering the Race by Allison Berg, and V. Lynn Kennedy's Born Southern: Childbirth, Motherhood, and Social Networks in the Old South. First, I will provide a foundation by analyzing conceptions of motherhood in the south, comparing the idealized white motherhood with the expectations of black mothers. Two key primary sources include the memoir of Belle Kearney, A Slaveholder's Daughter, and a piece titled "More Slavery at the South," which details the life of a Black family nurse in the post-reconstruction south. Next, in the bulk of my paper, I will explore how these conceptions affected how white and black women organized politically. This section will be guided by the speeches, publications, and writings of political organizers like Terrell and other NACW leaders, Laura Clay, and once again, Belle Kearney. Altogether, I argue that while maternalism was a central tenet of the southern suffrage movement, it relied on pre-conceived notions of race and status, and was ultimately used as a strategy to resolve the "race question" within the suffrage movement.

Consent's Absence: Race, Poverty, and Federal Sterilization Policy in 1970s Alabama

London Eller
Department of History, The University of the South, Sewanee, TN
Faculty Sponsor: Andrea Mansker

In June 1973, Minnie Lee Relf, age fourteen, and her sister Mary Alice, age twelve, were surgically sterilized at a family planning clinic in Montgomery, Alabama, federally funded by the Department of Health, Education, and Welfare (HEW). The girls' mother, who could neither read nor write, had signed consent forms with an "X," believing she was authorizing continued contraceptive injections, not permanent sterilization. Following my previous work on the American eugenics movement, I would like to explore a feminist microhistory of the Relf v. Weinberger case. Through previous research, I discovered that despite its significance in reshaping federal reproductive policy and galvanizing civil rights and feminist coalitions, the Relf case has received remarkably little sustained scholarly attention in the nearly fifty years since the verdict. Gregory Michael Dorr's chapter in A Century of Eugenics in America remains the most thorough treatment, yet even this work situates the case within a broader policy narrative rather than examining it microhistorically on its own terms. This project seeks to address that gap by reconstructing the specific circumstances, actors, and institutions that made Minnie Lee and Mary Alice Relf's sterilization both possible and, ultimately, contestable. For feminist historical scholarship, the case is significant on multiple fronts. Most fundamentally, it reveals how reproductive "choice", a concept central to mainstream feminist

discourse of the 1970s, operated very differently for poor Black women and girls than for white, middle-class women. While predominantly white feminist organizations fought for access to contraception and abortion, Black women faced the opposite problem: coerced sterilization imposed by the same medical establishment that denied them reproductive autonomy. The Relf case thus exposes the racialized limits of liberal reproductive rights frameworks and demands an intersectional analysis attentive to how race, class, gender, and disability converged in the targeting of particular bodies for population control. These intersections cannot be understood apart from the legal and political context of the early 1970s. What sterilization statutes remained on the books in Alabama and other southern states by 1973? How had federal family planning legislation, particularly the Family Planning Services and Population Research Act of 1970, created funding streams that enabled coercive practices? I am equally interested in the broader politics of reproduction during the Nixon era; how Nixon's "New Federalism" and his administration's embrace of population control shaped discourse around social welfare and reproductive intervention. The political suppression of HEW sterilization guidelines until after the 1972 election suggests that reproductive policy was deeply entangled with political calculation, and I want to trace those entanglements in detail. I also examine how civil rights organizations responded to the Relf case and to coercive practices operating under HEW more broadly. How did organizations like the NAACP and the National Council of Negro Women frame the issue, and how did their responses differ from or align with those of predominantly white feminist organizations like the National Organization for Women? These coalitional dynamics, and their tensions, speak to larger questions about whose reproductive concerns have been centered in feminist movements. Finally, the case connects to ongoing struggles over reproductive justice. Sterilization abuse did not end in 1974; recent investigations have documented coerced sterilizations in ICE detention facilities, and the reproductive rights of incarcerated and disabled people remain contested. In an era of renewed attacks on reproductive autonomy, this research speaks to urgent contemporary debates. I want to talk about these continuities without flattening the historical specificity of the case.

Death Songs and Nostalgia for a Dying Race: Depictions of Native Americans in American Theater and Music between 1800 and 1830

Madelyn Smythia
Department of History, The University of the South, Sewanee, TN
Faculty Sponsor: Woody Register

Between 1800 and 1830 American theaters and music halls rang with many new musical compositions and theatrical productions revolving around the past and Native peoples. The relationship between the US public and native peoples was complex with many important facets necessary to understanding, many of which were demonstrated within those halls and theaters. Music and theatrical productions created, written, performed, and published from 1800 through the years leading up to the Indian Removal Act of 1830 show a side of the relationship that government documents and newspapers do not. My examination of these productions and musical compositions yields insights into the emerging view of Native peoples as a dying race with the fascination and nostalgia that comes with that romanticization. This paper analyzes popular musical compositions, such as "A death song of an Indian chief," and plays, such as Metamora. The works were published during this period to gain a fuller understanding of the political and cultural factors that shaped the federal government's American Indian policies and relations. My paper addresses the emergence of fascination with the imagined "dying race" as a creative tool within those two mediums and in political debates affecting American Indian policy.

'Tis Human to Air: Air, Récitatif, and French Musical Identity in Marc-Antoine Charpentier's Medée

Louise Block
Department of Music, The University of the South, Sewanee, TN
Faculty Sponsor: Stephen Ray Miller

The earliest works which would now be described as "operas" showed a remarkable diversity of form and performance practice, chiefly along cultural and political lines. Opera as we know it evolved in the late sixteenth-century Florence (Italy), from the intermedi, brief but elaborate works of lyric theater with no unified plot. The very first "favola in musica," La Dafne, was first performed in 1598. French composers of the seventeenth century would go on to engage closely with this new art form, whether through criticism or appreciation. However, the artistic and political landscape of France—shaped by Louis XIV—delayed the fruition of the French operatic work until the 1670s, in which the composer Jean-Baptiste Lully (1632–1687) pioneered an enduring form of tragédie lyrique. Although limited in his works by the absolute control Lully eventually exercised over the French musical scene, Marc-Antoine Charpentier (1643–1704), who would survive Lully, incorporated the knowledge attained by his experience with Italian music into his works. Charpentier's 1693 opera Medée was premiered six years after Lully's death, albeit remaining in the shadow of his legacy. The generally conservative Lullian style of Medée gives great insight into the forms of expression prioritized by French composers at the time, while containing enough Italianate elements (notably, an entire aria in the Italian language and style) to establish Charpentier's musical identity and reinforce the contrast between French and Italian vocal works. Close examination of the structure and form of Medée, especially pertaining to the relationship between recitative and aria, was undertaken alongside examination of Lully's earlier opera Atys. Relationships between plot organization and styles of delivery—specifically recitative and aria—hint at uniquely French standards for lyric drama.

Decorating The Lost Cause: Landscape Memory and the Confederacy at Sewanee

Eleanor Graham
Department of History, The University of the South, Sewanee, TN
Faculty Sponsor: Woody Register

As a Sewanee student, I have encountered a landscape where the legacy of slavery is omnipresent yet largely unacknowledged. Sewanee, perhaps more than any other place I have ever been, is a site where nearly everything serves as a memorial to the Confederacy and, by extension, to enslavement. Much of this legacy remains invisible, woven into the fabric of the university since its founding in 1857. During my freshman year, I took a class titled Slavery, Race, and The University, which aimed at unpacking these notorious sites in Sewanee. One place that perhaps most clearly displays this legacy–though it is recent and somewhat innocuous in its namesake–is the Sewanee Inn. Within this class, I worked with household objects in order to render them as objects of memory, contextualizing the space they were present in. In particular, I designed a lamp that displayed context for Thompson Union, which is now Biehl Commons. This presentation would allow me to present research put into this lamp and also inspect the landscapes of memory at Sewanee specific to the research I completed.

"The Pastures of Eternal Life": Religious Educations in the Carolingian Reforms
Paul Ojeda
Department of History , The University of the South, Sewanee, TN
Faculty Sponsor: Romulus D. Stefanut

Beginning in the eighth century, and continuing into the ninth, the Frankish Empire under Charlemagne and his successors entered a period of intellectual revival commonly known today as the "Carolingian Renaissance." Central to this revival was a widespread program of religious and educational reform, originating in the legislation of the courts of Charlemagne and Louis the Pious. Contrary to the position of certain scholars, this reform was not intended merely for the upper classes and clergy, but in both intention and practice penetrated into the lower orders of Carolingian society. This presentation will demonstrate how this program of reform was enacted throughout each level, making extensive use of primary documents and contemporary scholarship, especially recent scholarship surrounding 'priestly handbooks,' those manuscripts actually used by Carolingian priests for devotion and instruction.

English and Classics

Location: Spencer Hall 262

Past Lives and Present Endings: Queer Temporality in Mrs. Dalloway
Mairyn McGilvray
Department of English and Creative Writing, The University of the South, Sewanee, TN
Faculty Sponsor: Lauryl Tucker

In Virginia Woolf's Mrs. Dalloway, expressions of queerness are relegated to the past. On the day of the novel, the lives of its primary characters, Clarissa Dalloway and Septimus Warren Smith, are defined by previous experiences of same sex desire. Septimus, a PTSD ridden veteran of World War I, is haunted by hallucinations of his love, Evans, who was killed shortly before the armistice. The housewife, Clarissa, reminisces on her romance and a singular clandestine kiss with childhood friend Sally Seton. Though Sally and Clarissa are still in contact, the two are drawn apart by social conventions. This essay will explore how the two characters challenge the confines of linear time through the lens of queer temporality and Elizabeth Freeman's queering of chromonormativity, with Septimus choosing to exit linear time completely through suicide, while Clarissa continues to live with reminders of her past as "presents" within her present. Through choosing to value her happier past within her present, Clarissa reconstructs her life in opposition to heteronormative markers of fulfillment. Though the two ultimately diverge in their strategies against chrononormativity, the novel ends in a moment of solidarity, with Clarissa hearing of Septimus' suicide from a guest at her party. Rather than passing judgment on his action, Clarissa views his death as an act of defiance against the tyranny of time, comparing his struggles to her own. Clarissa and Septimus are ultimately two sides of the same coin, queer individuals grappling with the confines of time and heteropatriarchal society, a fight that leads Septimus to his grave and Clarissa into the present, and a life defined by the recognition of her queer experience.

Stoic Consolation for the Heavenly Life in John Chrysostom's Letters to Olympias
Brin Copp
Department of Classical Languages, The University of the South, Sewanee, TN
Faculty Sponsor: Paul Holloway

John Chrysostom's use of Stoic consolatory arguments in his letters to Olympias at times supplants the approach expected of an exiled archbishop. In epistles from a renowned preacher and bishop writing to build the resolve of a despairing deaconess, one might look for applicable scriptural teachings, rousing theological exhortation, or appeals to the resurrection. However, Chrysostom's biblical exempla often prove at best tangentially related to the deaconess' situation; his arguments are widely ethical rather than theological; Christ himself, in fact, makes only a few appearances in seventeen letters. Chrysostom reminds Olympias of her heavenly reward and effusively praises her Christian virtues, but his arguments have been sculpted into thoroughly Stoic frameworks. Chrysostom's treatment of virtue and hardship echoes Epictetus more than it does Paul; furthermore, his approach closely follows the model of Seneca's consolatory letter from exile. While these letters would also benefit from a broader analysis of Chrysostom's place in a long-standing tradition of classical and Christian consolation, this paper narrows in on the line of reasoning of the eighth letter to Olympias with the aid of Stoic textual comparisons to draw out Christian-Stoic tensions in detail. It ultimately argues that Chrysostom's preoccupation with lofty philosophies of suffering, particularly the Stoic virtue of apatheia, overlooks and even subverts possible consolatory approaches through faith or resurrection. Moreover, it leads him to neglect any significant engagement with the actualities of Olympias' politically fraught predicament. His tireless reassurance to her is that reason alone is sufficient, not only to resist despondency, but also to rise to the heavenly life while still living in this one.

Art History

Location: Gailor Hall 130

Parallel Times: Constructing Uniquely New Spanish Calendrical Systems in the Sixteenth Century
Ella Swift
Department of Art History, The University of the South, Sewanee, TN
Faculty Sponsor: Leslie Todd

During the Iberian conquest and colonization of New Spain, both the Iberian and Mexica people utilized calendrical systems as a way to order and mediate the chaos that occurred as a result of converging cultures in the New World. Both the Iberian and Nahua cultures relied upon linear genealogy, important religious dates and cycles, and scientific numeration to construct their calendrical systems prior to European colonization. This paper draws on a Calendar Wheel attributed to the Franciscan missionary Motolinia as an example of how missionaries saw and translated Nahua temporal systems for colonial purposes. The illustration utilizes an organized circular diagram that draws on the visual elements of composition, line, and color to mirror European calendrical tradition and combines the Nahua calendar with the Julian Calendar to explain New Spanish temporal systems to an European audience in a highly scientific manner. I also employ The Codex Mexicanus to examine how Nahua Scribes used calendars to assert their historical significance while constructing a new identity as Christian subjects within New Spain. The Mexicanus displays both Christian and Nahua religious days and charts the Mexica and Christian calendars together, using line and color that mirrors both European and pre-colonial Mexica visual tradition. It preserves the Mexica

calendar and iconography, while allowing the Christian calendar to structure time and drawing on European visual language to support the new identity of the Mexica within New Spain. I ultimately argue that similarities within European and Mexica calendrical systems acted as a point of overlap between the two cultures whereby traditions of time were adapted to the New World rather than imposed upon it, creating a new, uniquely New Spanish calendrical system through a cross-cultural use of visual elements that allowed both the Spanish and the Mexica to order and mediate their new political and social co-existence.

Femininity in Katsushika Hokusai's Hyaku Monogatari

Leah McBain
Department of Art History , The University of the South, Sewanee, TN
Faculty Sponsor: J. Thompson

As global interest in the scope of Japanese horror media grows, analyzing the social, religious, and artistic implications of representations of monstrous femininity in Japanese visual culture becomes more pertinent. The Edo period (1603-1868) is characterized by almost three hundred years of peace, the development of an urban culture centered in Edo (now Tokyo), economic growth, and strict isolationist policies. Katsushika Hokusai's (1760-1849) woodblock print The Mansion of Plates (Sara yashiki) which depicts in his print is the widely known ghost tale of Okiku, following the story of the tormented spirit of a young servant. The tale of Okiku attests to the common Edo pastime of hyakumonogatari kaidankai, the telling of one hundred ghost stories, demonstrating the perception of the supernatural during this time. Hokusai's print ties representations of femininity to religion, folklore, and the Edo period (1603-1868) enthusiasm for kabuki theater. Using iconographical elements of hair, corporeal form, and wetness, The Mansion of Plates presents the horrors of femininity as a foil to the ideal female form in Edo period culture. Therefore, Hokusai's print illustrates the monstrous feminine, asserting the horrific consequences of women refusing, resisting, or who have been violently excluded from the patriarchal structures that define them.

Shiba Kōkan: Artist and Intellectual in Edo-Period Japan

Heyward Bost
Department of Art History, The University of the South, Sewanee, TN
Faculty Sponsor: Leslie Todd

The Edo period has often been framed as an isolated time in Japan's history. By observing the works of artist Shiba Kōkan, an image of a global city emerges. Kōkan was obsessed with foreign cultures, studying under the Kano school and practicing Dutch artistic methods. He was primarily enthralled by the scientific revelations of Hollanders, often favoring their culture to his own. Shiba Kōkan embodies inventiveness and singularity in Japanese art. He is one of many Edo-period eccentrics. In Japanese art, eccentricity has long been valued. Especially in response to strict codes of social behavior, in the seventeenth century, artists increasingly expressed singularity in their works, ignoring conventions of academic schools. The works View at Mimeguri (1783) and A Meeting of Japan, China, and the West (late 18th-19th century) demonstrate that Shiba Kōkan was not simply the "Father of European Painting in Japan," but an ambitious intellectual who used Dutch science, materials, and visual strategies to construct a new aesthetic identity that reconstructed artistic movements, such as the European Baroque. The works of Shiba Kōkan do not simply reflect foreign influence; they actively interpret, critique, and reconfigure it within a Japanese context. Kōkan's art reveals Edo Japan as a site of global exchange.

Anatomy and Innovation: George Stubbs' Revolution of the Horse in Art

Caroline S. Kirtley
Department of Art History, The University of the South, Sewanee, TN
Faculty Sponsor: Leslie Todd

In 1758 George Stubbs (1724-1806) wrote The Anatomy of the Horse based upon his anatomical studies of horses, and later applied his knowledge to his groundbreaking work, Whistlejacket (1762). This life-size painting sits in the National Gallery in London today and represents the perfection of the horse in art that Stubbs was able to achieve. This study examines the work of George Stubbs, proving his revolutionary contribution and dedication to the depiction of horses in art. The research begins with an examination of sculptures and paintings predating Stubbs's work including The Equestrian Statue of Marcus Aurelius (170-175 CE) and Albrecht Durer's, Four Horsemen of the Apocalypse (1502) to address the trajectory of horse depictions in European art leading up to Stubbs's contribution. This paper later applies comparative analysis of artists in the decades and centuries after Stubbs's contribution such as Jacques-Louis David, Edgar Degas, and Alfred James Munnings, to prove the impact of The Anatomy of the Horse on equine depictions in European art history.

A Generosity of Form: Sensuality vs. Sexuality in Fernando Botero's Woman Putting on Her Brassiere, 1976

Joanie Farley
Department of Art History, The University of the South, Sewanee, TN
Faculty Sponsor: Leslie Todd

One of the most heavily charged iconographies in visual history is the rendering of the female nude. Artists and scholars throughout Euro-American art history have frequently objectified women's bodies through a heteronormative, sexualized lens. Despite shifting temporal expectations of the body, Colombian artist Fernando Botero (1932-2023) developed an unprecedented visual language when describing his female subjects. In 1976, Botero created Woman Putting on Her Brassiere, an oil painting of a naked woman redressing and leaving her male companion asleep in bed. His iconic exaggerated style removes the eroticism from an archetypal sexual setting, instead emphasizing sensuality and contentment with the abundant human form. He satisfies the viewer's visual senses by creating an imaginative and fantastic bodily language known as 'Boterismo'. By viewing Woman Putting on Her Brassiere through the lens of gender theory, application of volume, and historical depictions of the female nude, Botero's painting demonstrates that nudity in women does not have to be explicitly sexual. The unprecedented female portrait reveals characteristics worthy of scholarship and presents a new paradigm for male artists to participate in the discourse of feminist art history.

The Body in Gender and Race: Yasumasa Morimura's A Requiem: Unexpected Visitors / 1945 (2010)

Isabelle Sniatecki
Department of Art History , The University of the South, Sewanee, TN
Faculty Sponsor: J. Thompson

The representation of the masculine body has been geared towards the Euro-American world, idealizing the white male form. Investigating Yasumasa Morimura's photograph A Requiem: Unexpected Visitors / 1945 (2010), this presentation challenges a Eurocentric past and present art canon. In this photograph, Morimura appropriates the original 1945 photograph of Japan's late

emperor, Hirohito (1901-1989), and the United States General Douglas MacArthur (1880-1964) as a self-portrait. This presentation begins with revisiting the past in the present, exploring Morimura's personal memories of World War II and Japan's postwar period. Comparing Morimura's photograph to the changing appearance of the Japanese emperor from the Meiji period (1868-1912) to the Showa period (1926-1989), this presentation will then define the evolving visual language of the emperor from a military commander to an apolitical figurehead. Examining the transformation of the Japanese emperor, this presentation then takes a broader perspective on the changes to the perceptions of gender and race during the late twentieth century to early twenty-first century. This presentation argues that Morimura's appropriation of this 1945 historical photograph blurs not only the perception of time, but race and gender, examining the transformation of the Japanese Emperor from Meiji to Hirohito.

Poster Session

Poster 1: The Body Condition and Identification of Lions in Amboseli National Park and Threats Facing Lions in the Amboseli Ecosystem

Clara Berdelman, Noora Herzog, Jenna McAmis
Department of Biology, The University of the South, Sewanee, TN
Faculty Sponsor: Kristen Cecala

This study assessed the health and population status of lions in the Amboseli ecosystem. The research was conducted inside Amboseli National Park, located in southern Kenya, and the surrounding community land and conservancies. Data was obtained by locating lions using callback machines and cameras to capture images of individual lions' whisker spot patterns and scars. These biometrics were used to identify and document individuals in each pride. Other data collected, including sex, age, location, and date of sighting, were also recorded to better understand lion pride composition, age structure, and sex ratio. Additionally, key informant interviews were conducted in order to determine the STAR score of the species and assess threats facing lions in the ecosystem. This study found 4 lion prides and 1 male coalition after 9 days of fieldwork. All individuals were considered healthy based on their body condition score index. A STAR score was calculated based on data collected during key informant interviews, and it showed that lions were of "low conservation concern" within the ecosystem. Every pride identified contained at least 2 males, and the number of individuals in a pride ranged from 4 to 12 lions. This study found that lions within the Amboseli ecosystem are healthy and are primarily threatened by human-lion conflicts, habitat loss, infrastructure development, and poor conservation management. The findings of this study suggest that proper land-use planning, stakeholder collaboration, and continued community engagement will collectively enhance lion conservation in Amboseli National Park and the Greater Amboseli Ecosystem.

Poster 2 (SPARC): Do birds adjust their foraging behavior differently in response to alarm calls vs. predator calls?

Izzy Grass, Dr. Katie McGhee
Department of Biology, The University of the South, Sewanee, TN
Faculty Sponsor: Katie McGhee

Prey decisions are strongly influenced by predation risk. Prey can assess predation risk via personal information, derived directly from the predator, or social information, derived from group mates

or nearby individuals. This information can then result in a behavioral response to minimize risk. I conducted a field experiment which used common backyard birds in Sewanee, TN. Birds were exposed to either Chickadee warning calls or Goshawk predator calls, and changes in the number of foragers, the amount of time spent foraging, and the number of vocalizations were recorded before and after call treatment. Both call types decreased the number of foragers and foraging time, which indicates that personal and social information are valued similarly. This decrease in foraging did not differ between predator calls and warning calls, suggesting that risk could be a determining factor when personal and social information conflict. These results illustrate the important role of risk in anti-predator decision making and further suggest the equal value of personal and social information when one is missing.

Poster 3 (SPARC): Does social context affect how quickly an individual will approach a novel object in mosquitofish?

Charlotte Proctor, Dr. Katie McGhee
Department of Biology, The University of the South, Sewanee, TN
Faculty Sponsor: Katie McGhee

Social context can influence how animals respond to novel stimuli, especially in animals that live in groups. Social information allows individuals, specifically naive individuals, to assess whether something is interesting or dangerous. In this study, I examined whether the presence of a conspecific affects the latency of mosquitofish (Gambusia affinis) to approach a novel object. My control group consisted of one focal fish alone in the test tank, called the alone treatment, and the test group featured a focal fish and a conspecific that served as a stimulus fish, called the shoal treatment. I recorded whether individuals approached a novel object and measured the time it took for them to approach within a distance of one or two body lengths. Whether fish chose to approach or not did not differ between treatments, and 60% of individuals in both groups approached the object. Latency to approach also did not differ significantly between treatments. Although slightly more fish in the shoal treatment approached the novel object quickly (¡10 seconds), this was not found to be statistically significant. These results suggest that the presence of a single conspecific does not alter risk-taking or exploratory behavior in mosquitofish. My findings contrast with previous studies on related species that have found that social context does have an impact on exploratory behavior. These differences among studies may be due to only one conspecific being present in my experiment, rather than a whole shoal, or because of additional variables that I did not account for, such as sex or personality.

Poster 4 (SPARC): How Does the Sound of a Boat Motor Affect Mosquitofish Activity?

Avery Graff, Dr. Katie McGhee
Department of Biology, The University of the South, Sewanee, TN
Faculty Sponsor: Katie McGhee

Being in the midst of the Anthropocene means that human-induced environmental change is affecting nearly every species on earth by disrupting ecosystem functions. Many anthropogenic stressors have had severe impacts on wildlife, such as habitat loss and fragmentation, invasive species, harvesting, climate change, and pollution. Anthropogenic noise pollution is considered a key threat to biodiversity and has been shown to have significant consequences on animal behavior in various habitats. This study examined whether anthropogenic noise pollution affects activity in mosquitofish, a prevalent invasive species, in a novel environment. Results showed that mosquitiofish significantly

increased risk-taking behavior during exposure to a boat motor playback. Mosquitofish are known to exhibit high behavioral flexibility and boldness, which are traits that likely contribute to their increased risk-taking behavior observed during exposure to anthropogenic noise pollution. With increasing rates of urbanization, managing anthropogenic noise pollution and invasive species is required to conserve native aquatic communities.

Poster 5 (SPARC): Strepsiptera Diversity in Sewanee and Throughout Tennessee

Samantha Moore, Eros Kubicki, Kirk Zigler
Department of Biology, The University of the South, Sewanee, TN
Faculty Sponsor: Kirk Zigler

Strepsiptera are obligate endoparasites that inhabit a host though part of their life cycle as males, and their whole lives as females. They are heavily understudied: only ten confirmed Strepsiptera specimens have been recorded in Tennessee over the course of about 200 years of research. A strepsipteran was found on a wasp species, Eremnophila aurenotata, on Sewanee's campus in 2021. While this species has been recorded as a strepsiptera host elsewhere in the US, it has never been recorded in Tennessee before. There may be more species diversity of strepsipterans than just what GBIF and iNaturalist show. To test this, I surveyed wasps at four different sites at Sewanee for at least 1 hour each week, catching any wasps with strepsipterans I could find. I also searched through wasp specimens in Sewanee's teaching collection, UTC's wasp collection, and MTSU's wasp collection. I then sequenced the genome of the host wasps. I found seven different host species, one of which has not been previously recorded as a host, and likely seven different strepsiptera species too. Within three months, I have doubled both the known strepsipterans and the known strepsiptera hosts in Tennessee. The next steps in this experiment include genetic sequencing of the strepsipterans, more surveys throughout the spring and summer, and searching through other wasp collections throughout Tennessee.

Poster 6 (SPARC): Do early social experiences affect reproductive investment within and across generations in a self-fertilizing vertebrate?

Fischer Flowers, Dr. Katie McGhee
Department of Biology, The University of the South, Sewanee, TN
Faculty Sponsor: Katie McGhee

It is widely understood that early social interactions can affect an organism's development and have long-lasting effects on both its growth and investment in reproduction. It is less well known whether these early experiences can carry over to affect the traits of future generations as trans-generational effects. To investigate these effects, we manipulated early-life social conditions of mangrove rivulus – self-fertilizing, hermaphroditic fish native to the Florida Everglades and Belize – by rearing genetically identical siblings either together in pairs or alone for two months. Within the pairs, one partner would become larger and therefore dominant over the other, exposing its partner to both social and nutritional stress. Following two months of paired rearing, the partners were separated and reared alone for several months. As individuals matured, we measured their growth rate along with the size and age at which they became reproductive. To assess whether the social treatments affected future generations, we also measured the size and age at which the next generation became reproductive. From these data, we can determine how early social experiences shape later investment into reproduction within an individual's lifetime, and whether these early experiences can also carry over to affect future generations.

Poster 7: Substrate Preference of Blue Ridge Two-lined Larval Salamanders

Lilah von Gruenigen, Dr. Katie McGhee
Department of Biology, The University of the South, Sewanee, TN
Faculty Sponsor: Katie McGhee

To avoid predators, prey adjust their behavior in a variety of ways. One way that could help them escape the notice of predators is to be choosy about the type of substrate or habitat that they occupy, potentially preferring substrates that offer more refuge or crypsis. In this study, I examined the substrate preference of larval salamanders in Abbo's Alley. For each larval salamander, I gave it a choice between a hard (sand and rocks) and soft (sand only) substrate. I recorded the first substrate chosen and how long they spent in each substrate within a five-minute trial. I found that larval salamanders did not have an initial preference for either substrate but over that five-minute trial, they tended to spend more time in the hard substrate compared to the soft substrate. Exploring whether this substrate preference is sensitive to the presence of predators or foraging opportunities would be an interesting avenue for future research.

Poster 8: Growing New Saffron Plants from Stem Tissue: Building a Tissue Culture System

Lilah von Gruenigen, Dr. Kevin Rodriguez
Department of Biology, The University of the South, Sewanee, TN
Faculty Sponsor: Kevin Rodriguez

Saffron (Crocus sativus) is a valuable plant, but it is difficult to study and improve because it does not reproduce through seeds. The ability to regenerate whole plants from tissue culture is a powerful tool for studying plants. In this study, we adapted existing tissue culture approaches to saffron using stem tissue. Stem sections were cultured in plant hormones to induce callus formation and promote somatic embryogenesis. We successfully generated actively dividing callus tissue that can be maintained under sterile conditions. To understand somatic embryogenesis, we examined the effects of sucrose concentration on tissue growth. Culture grown in higher sucrose concentration conditions showed an increase in embryogenic structures. In contrast, lower sucrose conditions resulted in limited growth and reduced developmental progression despite having similar hormone levels. These results suggest that stem-derived tissue can support regeneration in saffron and highlight the importance of the carbon source in promoting embryogenesis. This work provides a critical tool for future applications, including the generation of clonal plants and the development of gene-editing approaches to study plant development and improve crop traits.

Poster 9 (SPARC): The effect of gape on the bite performance in primates

Arianna Shirak, Jose Iriarte-Diaz
Department of Biology, The University of the South, Sewanee, TN
Faculty Sponsor: Pepe Iriarte Diaz

The capacity of an organism to generate bite force depends on the position of the bite point, and on the size and position of the jaw adductors (chewing) muscles. In primates, the influence of muscle mechanics on bite force has been extensively studied, but these studies have primarily focused on mandibles at occlusion (i.e., the jaw is fully closed). However, primates usually generate bite force at some degree of jaw opening (i.e., gape), which stretches the jaw adductor muscles, affecting their ability to generate force. However, how gape affects bite performance in primates is not fully understood. The goal of this study was to evaluate the effect of gape on the bite force capabilities in primates. We used 3D digital models of the cranium and mandible to simulate the mechanics of

the three main jaw adductor muscles (masseter, medial pterygoid, and temporalis) across a range of gape angles in a sample of 97 species from the three major primate clades (catarrhines, platyrrhines, and strepsirrhines). For each muscle, we calculated mechanical advantage, a metric of bite force capability, and strain, a measure of how much the muscle stretches with gape. Our data shows that platyrrhines show a higher mechanical advantage than both catarrhines and strepsirrhines for all three muscles. In contrast, muscle strain displays more complex differences between clades, but nonetheless, platyrrhines exhibit consistently higher strains than catarrhines. These results suggest that platyrrhines may be better adapted to convert muscle force into bite force, based on their higher mechanical advantage. However, higher strains might negatively affect bite performance at large gapes. Overall, these differences indicate distinct biomechanical adaptations among primate groups, which likely relate to differences in feeding behavior.

Poster 10 (SPARC): How do early social conditions affect attractiveness to males in mangrove rivulus?

Hannah Fitzgerald, Dr Katie McGhee
Department of Biology, The University of the South, Sewanee, TN
Faculty Sponsor: Katie McGhee

Early social interactions can play a crucial role in shaping developmental trajectories, with lasting consequences for growth, behavior, and reproductive strategies. In this study, we investigated how variation in early social experience influences later attractiveness to males in mangrove rivulus (Kryptolebias marmoratus) which are hermaphroditic, self-fertilizing fish that occasionally outcross with rare male fish. To manipulate early social conditions, genetically identical siblings were reared either in isolation or in competitive pairs for two months. Within socially paired treatments, one individual typically became larger and behaviorally dominant, while the other partner was smaller and subordinate. Following this period, individuals were separated and reared individually until adulthood. As adults, we assessed male preference using a three-way choice assay in which males could associate freely with hermaphrodites from each early social treatment. Male association time was used as a proxy for hermaphrodite attractiveness. By examining how early social environments influence later attractiveness to males, we aim to provide insight into the developmental factors that may contribute to variation in outcrossing behavior in mangrove rivulus.

Poster 11: Early interactions affect body size and risk-taking behaviors in a self-fertilizing hermaphroditic fish

Jillian Hall, Grace Jordan, Dr. Katie McGhee
Department of Biology, The University of the South, Sewanee, TN
Faculty Sponsor: Katie McGhee

Competition for resources and space is widespread across taxa. Growing up in a competitive environment can cause individuals to become dominant or subordinate, which affects body size. These differences in body size can carry over to a variety of traits. For example, small body size and limited food access might increase exploration and dispersal into novel habitats. Using the model organism mangrove rivulus (Kryptolebias marmoratus), we examined whether early competitive experiences affect exploration, dispersal, and neophobic behaviors later in life. Our social treatments included genetically identical siblings that were paired or remained alone as a single. After three months, the pairs were separated and each fish housed on its own. There were significant differences in body size between all three treatments due to their early social experiences. Exploration was measured by recording the amount of time spent outside of a shelter in a novel tank.

To measure dispersal, we recorded the tendency to move across land and enter water. Neophobia was measured as time spent interacting with a novel object. We found that social treatment had no effect on exploration, but being reared as a single increased the tendency to disperse. We also found that the smaller partners were the most neophobic compared to their partners and singly reared individuals. Our findings suggest that early social experiences can influence behavior later in life, specifically by shaping the tendency to disperse over land and interact with novel objects.

Poster 12 (SPARC): The Role of Dopamine in Negative Behavioral Responses of the Gray Sea Star

Kara Taylor, Josh Fairhead, Jadon Fetrow, Ellie Vincent, Chris Shelley
Department of Biology, The University of the South, Sewanee, TN
Faculty Sponsor: Chris Shelley

Dopamine is a key neurotransmitter involved in motivation and movement in animals. While the role of the dopamine signaling system in echinoderms, specifically the gray sea star, Luidia clathrata, has been previously studied, much remains to be discovered about its role in different sea star behaviors. Research has shown that immersion in haloperidol, a dopamine receptor antagonist, slows down the time of the righting response of Luidia clathrata. We therefore hypothesized that haloperidol may impact other behavioral responses as well. The time a Luidia clathrata takes to move towards food was determined, with or without immersion in 100 micromolar haloperidol, and haloperidol was found to inhibit food-induced movement. We were further interested as to whether disruption of dopaminergic signaling could impact a negative behavioral response. We are investigating whether a model of a predatory fish added to the tank can act as a negative stimulus to determine whether the time spent in each section of the tank (proximal or distal to the fish) is affected, and whether this behavioral response can be abolished by haloperidol.

Poster 13: Assessing the status of Desmognathus abditus in intermittent streams of the Cumberland Plateau

Davis Peltier, Saunders Drukker, Philip Gould, Kostas Andriotis, James McGrory, Kevin Fouts, and Kristen Cecala
Department of Biology, The University of the South, Sewanee, TN
Faculty Sponsor: Kristen Cecala

Much of what we understand about stream salamander ecology is taken from locations where streams are hydrologically stable and/or locations where they are abundant. On the Cumberland Plateau, the Cumberland Dusky Salamander (Desmognathus abditus) is an uncommon species with a narrow range of suitable habitat - occurring only in steep stream segments where streams fall from the Cumberland Plateau. Since their description in 2003, a single range-wide study identified two population clusters with differences in population sizes and body sizes. New phylogenetic analyses revealed that the increased performance of southern populations may have been biased by inclusion of populations now identified as D. ocoee. We surveyed known and predicted localities and re-evaluated the data. Occupancy of D. abditus has remained relatively stable while abundances have changed in the past decade. After removing D. ocoee from the analyses, there are no spatial patterns in body size suggesting that climate does not play a role in limiting the southern distribution of D. abditus. Instead, it appears that interactions with D. ocoee to the south and east and D. ochrophaeus to the north limit the spatial distribution of D. abditus. Within streams, interactions with D. fuscus contribute to the narrow elevation range that the species currently occupies. With little forest conversion occurring in these steep forests, the primary threats to D. abditus are climate

change and disease. The Cumberland Plateau retains very little soil or water yielding flashy and ephemeral streams. Research is needed to understand how shifting precipitation patterns could contribute to declining D. abditus commonness.

Poster 14: Investigating the Development and Ageing of the Mechanosensory Neurons in the C. elegans

Landis Fluck, Ivy Gates, Lindsay Brannan, Grace Gearhart, Bikash Choudhary
Department of Biology, The University of the South, Sewanee, TN
Faculty Sponsor: Bikash Choudhary

Ageing is one of the key factors that profoundly affects brain-related functions, often leading to age-associated neurodegenerative diseases. In this study, we sought to understand the developmental trajectory of neurons and how ageing manifests as the organism grows older, using Caenorhabditis elegans (a.k.a worm), a well established genetic model. C. elegans possesses a simple nervous system consisting of only 302 neurons. We selected the mechanosensory neurons as our model because they are easy to identify and suitable for imaging analyses. Our findings show that at the early L1 larval stage, PLM (a type of mechanosensory neuron) neurons do not exhibit branch formation and therefore lack synapses. Synapses appear later in the L1 stage. From L1 to L4, the neurons increase in size and gradually reach maturation, accompanied by an increase in synapse size. In adult and further stages, specifically from day 3 (D3) to day 7 (D7), we observed significant aging associated changes, including increased cell body derived ectopic outgrowths and axonal fasciculation defects. In conclusion, C. elegans mechanosensory neurons display distinct ageing related morphological signatures, making them a valuable model for studying neuronal ageing as the organism progresses through its lifespan.

Poster 15: The drift fence: a spotted salamander hotspot

Diana Rung, Kristen Cecala
Department of Biology, The University of the South, Sewanee, TN
Faculty Sponsor: Kristen Cecala

Spotted salamanders (Ambystoma maculatum) are known to stay faithful to their natal pools, but a certain number, most of them juveniles, do disperse to other pools to breed. I aimed to measure dispersal in adult spotted salamanders by capturing individuals that had previously been marked at the drift fence in pools outside of the drift fence. I divided the study site – a 1 kilometer buffer around the drift fence – into six zones and sampled each zone at least three times during the breeding season. At each pool, I placed one minnow trap per approximate 10 meters along the pool's edge, with a maximum of five traps per pool, and baited each trap with a glow stick. I also recorded the number of spotted salamander egg masses that I sighted at each pool. I captured adult spotted salamanders on only two occasions, and, aside from a single unmarked individual found opportunistically, I found them only at the drift fence. However, considering that I saw over 6 times the amount of egg masses at the drift fence pool as I did at any other pool (79 versus 12), this result is not unusual. Because I caught no adult spotted salamanders in any traps outside of the drift fence, I cannot draw any conclusions regarding adult site fidelity in this population. However, judging by the egg mass counts, spotted salamanders do seem to prefer the drift fence pool over others – though their reasons remain elusive.

Poster 16: C. elegans Exposed to Environmental Plastic Particulates Experience Proteostasis Dysfunction

Elaina S. Prince, Hazel R. White, Isabella Danos, Linn Lett Moe, Mc Noriel Baldonado, Adeline G. Smith, Elise A. Kikis
Department of Biology, The University of the South, Sewanee, TN
Faculty Sponsor: Elise Kikis

The ability to maintain a balance of protein synthesis, folding, trafficking, and clearance, otherwise known as "proteostasis," is essential for cellular and organismal health and longevity. A progressive loss in proteome stability is a well-recognized hallmark of aging. Proteins that are metastable, particularly those associated with neurodegenerative disease such as Alzheimer's disease (AD) and Huntington's disease (HD) are especially susceptible to misfolding and aggregation. As micro- and nano-plastics have become ubiquitous in today's world, being found in water and food systems, we examined the effects of such environmental pollutants on disease-related protein misfolding. Previous work from our laboratory revealed that traffic-derived nanoparticulate air pollution contributes to a collapse of proteostasis in Caenorhabditis elegans. Here, we aimed to address whether two different types of synthetic polymers, commercially available nanopolystyrene (nPS) and micro-rubber particles from artificial sports turf, similarly disrupt proteostasis. To address this, we used transgenic strains expressing proteostasis sensors; specifically, aggregation-prone polyglutamine. We found that both nPS and micro-rubber significantly increased protein aggregation and associated toxicity, indicative of proteostasis imbalance. To determine whether the observed effects in C. elegans reflect direct disruption of protein dynamics or an indirect effect induced by altered growth of the bacterial food source, we measured E. coli growth curves in the presence of nPS and found no statistical effect on bacterial growth. This suggests that changes in protein aggregation and toxicity directly impact the ability of C. elegans to maintain proteostasis. Collectively, these findings indicate that exposure to both plastic-derived particulate pollutants may compromise proteostasis and represent environmental risk factors that could contribute to the development or progression of neurodegenerative disease.

Poster 17: Predicting Habitat Suitability for Phacelia sewaneensis, a Newly Discovered Plant Species on the Domain

Biology 206 (Plant Ecology) Class - Spring 2026.
Department of Biology, The University of the South, Sewanee, TN
Faculty Sponsor: Jon Evans

Phacelia sewaneensis (Sewanee purple phacelia) is a recently described plant species discovered in Shakerag Hollow on the Sewanee Domain. It was distinguished from the more common Phacelia bipinnatifida using genetic, morphological, and ecological analyses. In the publication describing the new species, the two taxa were shown to occur in large, adjacent, non-overlapping patches that remained compositionally stable across years. P. sewaneensis was associated with rocky soils and occurred in higher-density populations than P. bipinnatifida. In this class project, we developed a habitat suitability model in ArcGIS to predict the potential distribution of P. sewaneensis across the Domain. The model incorporated landscape variables including slope, aspect, lithology, and elevation, and was parameterized using occurrence data from iNaturalist. We conducted field visits to assess model accuracy. The model predicted a substantially broader distribution of P. sewaneensis than was observed in the field. These results suggest that, although P. sewaneensis occupies a narrow range of suitable habitat conditions, its realized distribution may be further constrained by limited seed dispersal.

Poster 18 (SPARC): Does a chickadee mobbing call affect squirrel behavior differently in urban vs. forest habitats?

Charlotte Accarrino, Dr. Katie McGhee
Department of Biology, The University of the South, Sewanee, TN
Faculty Sponsor: Katie McGhee

Predator presence can cause a variety of behavioral adjustments in prey, but prey must be aware of the predator first to be able to adjust their behavior appropriately. By paying attention to the predator warning calls of other species, prey might be able to increase their vigilance and reduce their own risk of predation. This study focused on the impact of a black-capped chickadee (Poecile atricapillus) mobbing call, which is an alert to a nearby predator, on the vigilance and foraging behavior of Eastern grey squirrels (Sciurus carolinensis), and whether this behavioral response varied between urban and rural settings. I conducted both a baseline and mobbing call treatment to squirrels located on campus and forest sites. I measured vigilance and foraging behavior via scan sampling of focal squirrels, as well as the number of squirrels visible before and after the baseline and mobbing call treatments, in locations on campus and in the forest. I found that squirrel behavior is impacted by the playing of a black-capped chickadee mobbing call, resulting in a decrease in both vigilance and foraging behavior in urban and rural settings. This means that squirrels have the capacity to recognize and understand the antipredator behavior of other species. Though campus and forest squirrels responded similarly, forest squirrels had a slightly greater change in foraging and vigilance behavior, likely due to the habituation of campus squirrels to urban life.

Poster 19: Establishing a methodological pipeline for studying ship-whale interactions in British Columbia, Canada

Charlotte Accarrino, Hannah Barrow, Mary Margaret Lemburg, Mackenzie Maxwell, Chloe Sims, Grace Baer, Janie Wray, Eric Ezell
Department of Environmental Studies, The University of the South, Sewanee, TN
Faculty Sponsor: Eric Ezell

Due to the rise in collisions, noise and pollution, shipping is one of the largest current threats to global whale populations, but spatial interactions between whales and ships remain poorly understood. A recent LNG shipping lane introduced to Gitga'at First Nation territory (British Columbia, Canada), where oceanic cetaceans occur very close to shore in steep-walled fjords, presents a rare opportunity to observe whale-ship encounters in close detail and in real time. Here we present preliminary analyses of drone-based documentation of whale behavior before, during and after the transit of 300m LNG ships. In summer 2025, drones were flown over whale habitat at high elevation, where shore-based visual scans were conducted by trained observers. In our lab, analysts reviewed the footage to identify whale blows and behaviors, and then measured the pixel locations of these features in order to produce accurate localizations of every surfacing event in relation to the transiting ship. With this spatially-explicit behavioral time series, we explored the potential for identifying changes in whale behaviors, such as travel pattern, breathing rate, dive time, and social cohesion, in relation to ship proximity. These records can also be used to evaluate the efficacy of ship speed reductions in reducing risks to nearby whales. These findings can inform conservation efforts and shipping management strategies within this important whale habitat, and in other regions where shipping is increasing.

Poster 20 (SPARC): Determining the Role of APETALA Genes in Saffron Flower Development

Eglesiana Pierra Mutavu, Elzie Elmore, Glory Dada, Kevin Rodriguez
Department of Biology, The University of the South, Sewanee, TN
Faculty Sponsor: Kevin Rodriguez

Saffron, renowned for its culinary, medicinal, and industrial applications, faces challenges in its cultivation due to labor-intensive harvesting methods and limitations in breeding strategies. Leveraging insights from floral identity gene studies in other species, this study aims to enhance saffron yield through genetic manipulation. Three potential APETALA genes, which have been shown in other species to be critical to flower development, have been found in Saffron; however, their functional significance has not been determined. Alignment of APETALA genes from various plant species provided insights into conserved regions, aiding in the development of CRISPR-Cas9-based gene knockout strategies. SnapGene, a software tool for in silico molecular cloning and plasmid design, was used to construct guide RNAs for CRISPR-Cas9 targeting of all three genes, with the aim of inducing loss-of-function mutations. This study showcases the potential of molecular techniques to target key regulatory genes involved in floral development, providing a basis for future functional studies in saffron.

Poster 21 (SPARC): At the Intersection of Food Insecurity and Injury: A Public Health Look at Women's Recurrent Fractures

Burbury Myers1*, Abdulganeey Olawin1, Eva Heidinger1, Rachit Saggar1, Cortez L. Brown, MD1, Hogan V. MaCalus, MD, MBA1,2,
Department of Biology at Sewanee: The University of the South, Department of Orthopedics at the University of Pittsburgh Medical Center, Public Health, Pre-Health, The University of the South, Sewanee, TN
Faculty Sponsor: Elise Kikis

Disclosures: Myers(N), Olawin(N), Heidinger(N), Saggar(N), Brown(N), Hogan (2-JBJS, Miller Review Course, Zimmer Biomet; 5- NIH/DoD; 8-Springer; 9- NIH, AOFAS, JARGOS, OFAF, Zimmer Biomet, Nth Dimensions Education Solutions, Inc., ISAKOS (Leg, ankle, foot committee), AAOS (Board of Specialty Societies) Malnutrition and food insecurity are increasingly recognized as factors that may influence musculoskeletal health, yet their role in recurrent foot and ankle fractures remains underexplored. This study evaluates how malnutrition and food insecurity affect the risk and anatomical patterns of recurrent fractures in female patients, a population particularly vulnerable to both nutritional deficiencies and reduced bone mineral density. We conducted a retrospective review of 198 female patients (15 years) treated for foot or ankle fractures at a single academic center. All patients had documented malnutrition based on ICD codes and available nutritional biomarkers. Clinical, demographic, and laboratory data were analyzed, and patient ZIP codes were geocoded to assess food insecurity using national datasets. Two logistic regression models examined predictors of (1) any recurrent fracture and (2) same-site versus different-site recurrence. No variables, including malnutrition subtypes or biomarkers, were significantly associated with overall fracture recurrence, although some factors (e.g., low prealbumin) showed modest trends. However, vitamin D deficiency emerged as a significant predictor of same-site recurrence, with a 2.54-fold increased odds ($p = 0.012$). Geospatial analysis revealed that most patients resided in food-insecure or nutritionally underserved areas. These findings suggest that while malnutrition broadly may not predict recurrence risk, specific micronutrient deficiencies—particularly vitamin D—may influence localized fracture patterns. Incorporating nutritional assessment and addressing

food insecurity may improve orthopedic outcomes and highlight an important intersection between clinical care and public health.

Poster 22 (SPARC): Length-weight relationships of Semotilus atromaculatus (Creek Chub) in two headwater streams on the Southern Cumberland Plateau

Mary Elizabeth Jackson, Grady Wells
Department of Department of Biology , The University of the South, Sewanee, TN
Faculty Sponsor: Grady Wells

Length-weight relationship (W = aLb) analysis is used by ecologists and managers to estimate biomass in fish populations. Our study compares length-weight relationships of Semotilus atromaculatus (Creek Chub) populations in two headwater streams on the Domain of the University of the South, Sewanee, Tennessee. Multiple 50-m reaches in each stream were sampled using the single-pass backpack electrofishing method. Lengths (mm) and weights (g) were measured and recorded for Creek Chub captured. There was a difference in length and weight in both streams. The average length of Creek Chub in the Mud Creek tributary population was 73.1 mm TL during post-spawning sampling and 59.89 mm TL during pre-spawning sampling; the average length of Creek Chub in the Barnes Branch population was 108.1 mm TL. The average weight of Creek Chub in the Mud Creek tributary population was 5.1 g during post-spawning sampling and 2.0 g during pre-spawning sampling; the average weight of Creek Chub in the Barnes Branch population was 15.9 g. We calculated length-weight relationships for Creek Chub in each stream. The slope (b) of the regression line in the Mud Creek tributary population was 2.89. The Barnes Branch population had a slope (b) of 2.65. Competition and predation from Centrarchids (Sunfishes) present in Barnes Branch may explain hypoallometric growth in the Creek Chub population there.

Poster 23: A Preliminary Quantification of Aggregations of Madtoms and Darters in Beans Creek, an Elk River Tributary

Bryce Martin, Mary Elizabeth Jackson, Grady Wells
Department of Biology, The University of the South, Sewanee, TN
Faculty Sponsor: Grady Wells

Aggregation behavior is poorly understood but has been noted in several madtom studies. Within Noturus, detection rates and increased fish densities have been observed during fall—winter months. This behavior likely provides benefits such as mate selection and increased efficiency of finding suitable refugia. However, aggregation also creates a temporal bottleneck where individuals are condensed within a smaller area. In this study, we observed and quantified aggregation behavior in a population of Slender Madtoms (Noturus exilis) in Beans Creek (an Elk River tributary) in southern Tennessee from October 2024—October 2025. Additionally, we note aggregation behavior in three comparative species: Redline Darter (Nothonotus rufilineatus), Fantail Darter (Etheostoma flabellare) and Tennessee Snubnose Darter (Etheostoma simoterum). We observed higher mean madtom counts during fall—winter months, as well as a transition into pool habitat. We also observed higher darter counts for the three mentioned species during spring—summer. Understanding aggregation behavior in more sensitive species, such as madtoms, may help inform future conservation efforts and species management plans.

Poster 24 (SPARC): Does the noise of human activity affect bird foraging on a college campus?

Amelia Bendick, Dr. Katie McGhee
Department of Biology , The University of the South, Sewanee, TN
Faculty Sponsor: Katie McGhee

Human presence and activity can greatly affect animal behavior, in particular through anthropogenic noise. While some animals may become habituated to humans, our impact on wildlife and how animals adapt to our presence remain important areas of research. This could be particularly interesting to study on a college campus which often has high levels of human activity and can be quite noisy. In this study, I examined if anthropogenic noise impacts the general behavior of birds in terms of time spent foraging, approaches to a feeder and vigilance. I observed the behavior of common feeder birds using a ten minute baseline of no sound and then immediately followed by ten minutes of anthropogenic noise from a speaker. The anthropogenic noise was a ten minute loop that consisted of people talking outside, dogs barking, kids playing, and a baby crying. My findings indicate that birds decrease their foraging time during anthropogenic noise. However, the birds do not alter their approaches to the feeder or their vigilance. Therefore, it is evident that humans do have an effect on some animals but some of them become habituated to our presence.

Poster 25: Development of a Transfection-Based Assay to Study Coronavirus Recombination

Anna E. Dula, Eleanor E. Forbes, Julianna G. Cannon, and Everett Clinton Smith
Department of Biology, The University of the South, Sewanee, TN
Faculty Sponsor: Clint Smith

Recombination during positive-sense RNA virus replication can increase genetic diversity within the population, potentially enabling the emergence of novel strains with altered virulence, host range, and/or pathogenicity. Coronaviruses, which have large positive-sense single-stranded RNA genomes, are particularly prone to recombination due to their genome replication strategy, which involves discontinuous RNA synthesis and template switching. Despite the demonstrated importance of recombination in coronavirus emergence, no non-sequencing-based assay currently exists to examine the molecular determinants of coronavirus recombination during infection. To investigate these mechanisms we first developed a plasmid-based recombination assay, utilizing Murine Hepatitis Virus strain A59 (MHV-A59), a well-established tractable model betacoronavirus. This involved a donor plasmid, which lacks a functional polymerase, and an acceptor plasmid, which lacks key structural proteins. While virus was only detected following co-transfection of both plasmids, additional controls suggested that one or more host processes could be contributing to non-replicative recombination. To circumvent potential host-mediated recombination, we reengineered the plasmids to enable T7-based transcription, with the eventual goal of co-transfecting purified, linear donor and acceptor mRNA molecules. Initial results demonstrate successful T7 transcription of the donor construct, while acceptor construct optimization is ongoing. This developing assay represents a novel and promising approach for investigating mechanisms of coronavirus recombination which may inform broader insights into viral evolution and the emergence of novel variants in pathogenic coronaviruses.

Poster 26: Linking forest quality and productivity to stream salamander success through the diet of Desmognathus abditus

Grace Cawley, Dr. Kristen Cecala
Department of Biology , The University of the South, Sewanee, TN
Faculty Sponsor: Kristen Cecala

Stream salamanders regularly respond negatively to forest removal, but previous studies have not explored the connection between forest quality and productivity and stream salamander success. We previously observed higher salamander occupancy in forests with higher productivity, which may be associated with more canopy structure and high water availability. We plan to assess one hypothesis for this relationship by studying the biomass and the diversity of herbivorous insects and the diet of desmognathan salamanders. By asking this question in Desmognathus abditus, this study will offer insight into the diet and the ecological mechanisms of their distributions. The specific morphological characteristics of D. abditus (leg/tail to SVL) are better optimized for jumping than climbing, which is unusual for a salamander typically found in waterfalls. That, alongside their habitat preferences, leads us to hypothesize that they are well-suited for consuming aerial prey. We chose sites along the Cumberland Plateau that had varying NDVI and fPAR values to test our hypothesis for the connection between productivity and salamander success. Adult diets will be assessed through non-lethal gastric lavage. The frequency of stomach contents will be compared to availability to determine any dietary preferences. We will collect leaf litter samples from the stream and the riparian zone to extract tiny insects and macroinvertebrates that could be potential prey. We expect to find a higher frequency of flying insects than available and a higher insect density in higher-productivity forests.

Poster 27: Evaluating Definitions of Mature and Old Growth Forests on the South Cumberland Plateau: A Comparative Study of the Savage Gulf Natural Area and Split Creek Observatory

Stephen Goetze, Dr. Tom Powell, Dr. Scott Torreanno
Department of Earth and Environmental Sciences, The University of the South, Sewanee, TN
Faculty Sponsor: Tom Powell

For thousands of years, humankind has manipulated forests for their materials and services, including wood products, foods, medicines, habitat, and more. In this long history of management, forests have gone through fundamental changes. The services and materials provided are, in many cases, irreplaceable, and due to this, efforts have been made to conserve them. To better define and then manage and conserve forests for their products and services, particularly mature and old growth forests. Executive Order 14072 issued by then-President Joseph Biden, called for, among other things, unified definitions of "mature" and "old growth" forests. These definitions are significant because they will inform policies and actions that affect forests across the United States. In this study, we used measurements from two forested areas on the south Cumberland Plateau: Split Creek Observatory (SCO) in Sewanee, TN, and Savage Gulf State Park (SGSP) in Grundy and Sequatchie Counties, also in Tennessee. Savage Gulf State Park contains pockets of what would be considered old-growth forest, with some areas having stands initiated around the late 1600s (Hart et al.). In contrast, Split Creek is not old growth since it has been selectively harvested twice since 1955, despite this, biomass on a kilograms per hectare basis is actually higher in Split Creek than at Savage Gulf. In this study, there were two main objectives. First, to compare the two forests on a variety of factors, including age, composition, structure, and ability to sequester carbon in the form of biomass. Second, to evaluate how current definitions would label these forests

to see if current definitions for the South Cumberland Plateau region are sufficient, as well as if and where improvements or adjustments could be made to definitions to better support healthy and productive mature and old growth forests in this region.

Poster 28: The Expansion of Floral Resource Availability Through Diverse Landcover Surrounding the University Farm Apiary

Leyden Schelke, Dr. Thomas Powell
Department of Earth and Environmental Sciences, The University of the South, Sewanee, TN
Faculty Sponsor: Thomas Powell

Honeybees are essential pollinators, playing a crucial role in the reproduction & fruiting of the plants that human communities rely on for forest services, fruit & vegetable production, climate regulation, & natural resources. As a superorganism, honeybee colonies function as their own self-sustaining system, capable of self-diagnosing weaknesses and needs present in the overall hive and collaboratively altering behaviors, such as foraging, in order to meet those needs. The Sewanee honeybee populations in the Farm's apiary have been a broken system for season after season – they fail to support themselves over the winter, indicating a breakdown in the self-sustaining function of the hive as its needs are not being met by their environment. In order to support the pollinators that the farm and forest functions rely on, it is necessary to understand where that breakdown is and how to best implement solutions to it. One potential source of weakness in the hive may be nutritional deficiencies in the nectar and pollen available for the hive to forage. This study analyzes pollen collected from foraging honeybees during the autumn season, quantifying the composition and diversity of plant species represented in that pollen and how those variables change over time. Only richness decreased significantly over the month in which pollen was sampled, and both evenness and Shannon diversity remained consistent throughout. This shows that although the number of species present in autumn decreases slightly and the species composition shifts as different blooms go in or out of season, the bees are nonetheless able to fill those nutritional gaps as they arise and maintain the proportions of different species in their forage, reflecting adaptability and alternative resource availability in Sewanee's landscape.

Poster 29 (SPARC): Effects of Heat Stress and Vegetation Change on Microhabitat Selection and Nesting Success of Scaled Quail in Far West Texas

Audrey Francell
Department of Earth and Environmental Systems, The University of the South, Sewanee, TN
Faculty Sponsor: Thomas Powell

Arid and semi-arid ecosystems and the species that inhabit them are increasingly threatened by factors such as overgrazing, climate change, drought, invasive species, and brush encroachment. Scaled Quail are an important game species in the Southwest region of the United States, and are indicative of a healthy ecosystem. Their declining populations are concerning for overall ecosystem health and the services that these ecosystems and this specific species provide. Preliminary data suggest that population declines are correlated with the loss of suitable habitat. This work outlines a research project aimed at understanding how Scaled Quail will respond in their movement behaviors, nesting success rates, and microhabitat selection as temperatures increase, and how a potential feedback between temperature and brush overabundance will limit viable Scaled Quail habitat. Current data suggest that the Scaled Quail's thermoneutral zone ranges from 25 to 35 °C. With more days exceeding 40°C in the summer months, understanding the target species' and their habitat's responses to these temperature increases will be imperative for protection and reducing

further declines. Using established methodologies in Far West Texas, including telemetry and GPS tracking of Scaled Quail, drone-based vegetation and landscape classification, ground-temperature monitoring, and camera surveillance of nests, this study tests the hypothesis that heat stress, coupled with reinforced brush encroachment, will limit Scaled Quail movement and nesting success. With native populations of ground-nesting birds declining globally, driven by land-use and climate change, especially in vulnerable and exploited arid and semiarid ecosystems, this research uses Scaled Quail as a case study for understanding how to sustain populations and enhance ecosystem resilience, which has broader implications for making informed land-management recommendations. Deliverables will include a decision-support tool to guide land management decisions that benefit overall ecosystem health and the species that inhabit these systems.

Poster 30: Linking NASA Earth Observations to a Cumberland Plateau Forest Inventory Reveals Topographic Controls Over Species Organization

Hattie Robbins, Sparrow Womack, Jasper Jones
Department of Earth and Environmental Systems, The University of the South, Sewanee, TN
Faculty Sponsor: Thomas Powell

Long-term forest monitoring plots around the globe provide decades of information about forest diversity and growth dynamics, which can be used to inform forest management decisions. The Split Creek Watershed in Sewanee, Tennessee, is a 20-hectare upland oak-hickory forest on the Cumberland Plateau that drains to a confluence of two streams. Using a grid system established by Dr. Karen Kuers in 2002, we physically tagged, geotagged, identified, classified crown-class, and measured all trees with a diameter at breast height (dbh) ¿ 5 cm in 50 40 x 40 m plots, equivalent to 8 ha of forest. The inventoried area covered the ridge to stream/depression topographic variability on the top of the plateau. We used this data to run several data analyses in RStudio, Google Earth Engine, and ArcGIS, including creating a Topographic Wetness Index map, an NDVI map, a DEM, and conducting a simple correlation test. Our inventory determined that chestnut oaks (Quercus montana) are the most dominant species in the watershed. Hickories and red oaks (Quercus coccinea, Quercus velutina) were predominantly found on midslopes and ridges, while maples (Acer rubrum, Acer saccharum) and tulip poplars (Liriodendron tulipifera) were mainly found in depressions. The present distribution of species within the watershed reflects both local topography and the timber harvests that took place during the 1950s and in 1976. We also found that the inventory data is reflected in Earth observations provided through NASA. This inventory provides a baseline dataset that future inventories can be compared to to observe how management practices alter species distribution over time, serving as the foundation for long-term forest monitoring on the Cumberland Plateau.

Poster 31 (SPARC): Best Restoration Practices: Do BDAs Mimic Inundation Patterns of Natural Beaver Dams?

Aydah Daniel, Rosalie Hinke, Susan Washko
Department of Earth and Environmental Systems, The University of the South, Sewanee, TN
Faculty Sponsor: Max Dahlquist

Watershed degradation in the Western United States is a continuing issue under climate change. The headwaters to the Colorado River in the Rocky Mountains are experiencing dryness, altered chemistry, and flashiness due to climate change. Management practices involving artificial beaver dams (BDAs) have been used to counteract these issues. Though well intentioned, lack of monitoring has led to a lack of understanding of how these BDAs are impacting streams. There

are uncertainties of how inundation patterns behind BDAs will change in shape, width, depth, and sediment deposition after a beaver further engineers the dams. We sampled six BDA ponds and beaver-augmented BDA ponds to compare a variety of morphological characteristics related to hydrology The beaver-augmented BDA ponds were significantly deeper than the BDA ponds since continuous engineering on the dams allows for more water impoundment and therefore a deeper pond. The BDA ponds had lower surface areas than the beaver-augmented BDA ponds since they had significantly shorter dams, and the beaver-augmented ponds were also rounder. There were not significant differences in the sediment grain size between treatment types since the beaver-augmented BDA ponds are so new. By comparing BDA habitats to beaver dams, this study improved understanding of the impacts of restoration using BDAs, and can be used in future conservation efforts.

Poster 32: Bedrock Depth Mapping in the Split Creek Observatory

Henry Nash, Sonit Sisolekar, Bowen Bell
Department of Earth and Environmental Systems, The University of the South, Sewanee, TN
Faculty Sponsor: Max Dahlquist

Soil depth, measured as depth to bedrock (DTB) is an important factor to consider when studying erosion and weathering, soil production and health, ecology, hydrology, and slope stability. Shallow depth limits soil's filtering capacity, forcing contaminants to travel rapidly along its surface. Shallow soils are more prone to erosion and slope failure, as water infiltrates less effectively, and saturates the soil-bedrock interface, potentially causing landslides, and the depth of soil influences the quantity of water and nutrients available to plants. Soil depth is therefore a crucially important input in a wide range of models in environmental sciences, but it is often challenging to obtain due to local variability and the time-consuming nature of manually probing for the bedrock-soil interface. However, under favorable conditions, the bedrock-soil interface can be imaged using ground penetrating radar (GPR) within a few centimeters of its actual depth. Using a GSSI UtilityScan GPR unit, supplemented by periodic ground-truthing with a manual soil probe, we have produced a ˜10-meter resolution DTB map of a portion of the Split Creek Observatory in Sewanee, TN, with point measurements interpolated using GIS software. This dataset will support forest science, hydrology, and geology research in Split Creek, and reveals local topographic, biological, and geological controls on soil depth.

Poster 33: Split Creek Streamflow Analysis

Everett Ackley, Bowen Bell, Brandon Christ, Aydah Daniel, Maxwell Gallivan, Stephen Goetze, Della Hahn
Department of Earth and Environmental Systems, The University of the South, Sewanee, TN
Faculty Sponsor: Keri Watson

Headwater streams on the Cumberland Plateau face multiple concurrent pressures as land use and climate change simultaneously influence stream hydrology and flow regimes. Although impacts of land cover and climate change are well documented in larger streams, headwaters are both highly sensitive and relatively understudied. The objectives of our study were: 1) to characterize the flow regime of the Split Creek watershed in Sewanee, TN and establish a baseline for comparison with contemporary patterns, and 2) to perform a preliminary comparison of the 2024-2025 water year with historical streamflow data (2002-2011) collected by Dr. Karen Kuers. We report baseline hydrologic characteristics of this ephemeral headwater stream, which is typical of small watersheds on the Cumberland Plateau. Preliminary analysis indicates increasing annual streamflow concen-

trated in spring months. Understanding shifts in the intermittency, intensity, and seasonality of runoff events is fundamental to predicting impacts on freshwater ecosystems and water quality in headwater systems. Results indicated that dry periods were occurring later in the year and were flashier but were also shorter. Runoff coefficients also changed over time, potentially indicating that groundwater stores needed to replenish more than they previously had after dry periods.

Poster 34: Landslide susceptibility on the Southern Cumberland Plateau

Lizzie Kriz
Department of Geology, The University of the South, Sewanee, TN
Faculty Sponsor: Max Dahlquist

Landslides are a major geologic hazard affecting the steep flank of the Southern Cumberland Plateau. In spite of this, little research has been done on landsliding in this area. Understanding the factors behind landslide initiation, and how they behave can give us valuable insight into how we might better safeguard our infrastructure and lives. However, this is difficult on a global scale because the factors for landslide initiation shift with the geology, climate, and land cover of the area, making understanding landslide risk place-specific. A widely used method for predicting landslide hazard exposure uses statistical analysis of landslide inventories from a specific area to identify what terrain, geology, and land use factors correlate with landslide locations, and based on these factors, predicting where landslides are likely to occur. To better inform sustainable planning and hazard mitigation in our area, we mapped more than 100 landslides across Franklin County on ArcGIS using 2015 Tennessee LiDAR Program data in an effort to better understand the landslide conditions of the southern Cumberland Plateau. Using the LSAT PM v1.0.0b, we statistically modeled landslide susceptibility in Franklin County, examining the size and length of the landslides and considering factors like lithology, slope, aspect, and moisture.

Poster 35: Evaluating land use change and methods in Austin Texas using ArcGIS PRO

Evelyn Price, Chris Van de Ven
Department of Earth Sciences/ Biology, The University of the South, Sewanee, TN
Faculty Sponsor: Chris Van de Ven

This study compares multiple types of land use change methods in ArcGIS Pro to evaluate urban growth patterns in Austin, Texas between 2005 and 2025 and to identify the timing and types of land use change. Land use data was analyzed in five year increments from 2005, 2010, 2015 and 2025. The methods used were the Esri Change Detection Wizard, Continuous Change Detection and Classification (CCDC), and change in Normalized Difference Vegetation Index (NDVI). The different datasets were standardized and compared to evaluate the accuracy of each method. Results varied based on the method's ability to accurately classify the type of land cover. Comparing each method revealed different strengths and weaknesses for different methods, specifically in detail, accuracy, and efficiency. All results showed an increase in urban sprawl from 2005 to 2025. The study found the expansion of urban development at the expense of agricultural land was the most common direction of land use change over those 20 years.

Poster 36: Tree Growth Behavior Across Species and Topographic Positions at the Sewanee Split Creek Observatory

Elizabeth Muller 1, Thomas Powell 1, Matthew Rudd 2
Department of Earth and Environmental Systems 1, Department of Mathematics and Computer Science 2, The University of the South, Sewanee, TN
Faculty Sponsor: Thomas Powell

Climate change is altering historical weather patterns in the southeastern United States, increasing the frequency and intensity of large storms and raising temperature, with potential consequences for the timing of tree growth initiation. Variation in the annual onset and cessation of tree trunk growth depends on temperature and water availability and can vary among species. Hence climate change threatens to alter forest structure, shift species composition, and successional dynamics via changes in growing season dynamics. This study establishes an initial baseline of tree trunk growth dynamics of nine species common to forests growing on the top of the Cumberland Plateau in Tennessee. This study also evaluates the effects of water availability on daily growth dynamics resulting from microtopographic differences on the plateau. High temporal resolution tree growth was measured using point dendrometers deployed on trees growing along a topographically variable transect in the Sewanee Split Creek Observatory. Growth initiation and cessation varied among species, and across topographic positions within some species. These findings highlight the importance of tracking growth phenology to better understand how changing climate conditions may impact forest dynamics. Understanding forest responses to these changes can inform silvicultural and conservation practices aimed at sustaining forest health and resilience into the future.

Poster 37: Sentinel-2 Growth Proxies for Historical Dump Identification Within an Eastern Deciduous Forest

Phin Hammond 1, Beatrix Adams 1, Timothy Mayer 2,3, Thomas Powell 1
Department of Earth and Environmental Systems 1, The University of the South, Sewanee, TN, National Space Science and Technology Center 2, University of Alabama in Huntsville, Huntsville, AL, NASA Marshall Space Flight Center 3, Huntsville, AL
Faculty Sponsor: Thomas Powell

Human civilizations are often built over the achievements of past generations, thus obscuring important aspects of cultural identity. Nevertheless, we remain fascinated by the scattered remnants of ourselves left intact underneath this progress. The material assemblages found at dump sites reveal aspects of cultural norms and human behavior not fully documented in conventional records. Dump sites that are 75-150 years old are often forgotten, leaving them subject to looting and greater forms of damage/destruction. Furthermore, as many historical dumps are located in rural areas that have been reclaimed by forests, they are often challenging to locate. This study utilized remote sensing to help locate and identify these forgotten and forested dump sites in mature deciduous forest on the South Cumberland Plateau of Tennessee. We used an Earth Observation toolset with a combination of Sentinel-2 indices (NDVI, EVI, SAVI, NBR, GNDVI, CCCI) to test our hypothesis: dump sites within forests can be located with remote sensing based on detectable differences in vegetation growth and composition as compared to the surrounding forest. We ground-truthed the toolset with field measurements of tree species composition, size, and density and soil carbon fluxes. Significant differences were detectable between the dump site and forested controls for all six indices. These differences were explained by observed differences in species composition, but not ecosystem function as determined by soil carbon fluxes. With further refinement, this study shows promise for finding dump sites within restored forests and broader application for identifying

visible patterns of disturbance on the landscape.

Poster 38: Assessment of The Relationship Between Delay Discounting Behavior and Self-Reported Levels of Impulsiveness

Allison Barrera Flores, Sarah Boldt, Valentino Cheek, Thomas R. Reppert
Department of Psychology and Neuroscience Program, The University of the South, Sewanee, TN
Faculty Sponsor: Thomas Reppert

Delay discounting refers to the tendency of humans and other animals to devalue goods for which they are required to wait. Between-subject differences in discounting behavior far outweigh within-subject differences (e.g., day-to-day changes), suggesting that discounting may represent a trait-like attribute of individuality. We developed and administered an intertemporal choice task to assess differences in discounting behavior across a large sample of Sewanee students. In the task, students were asked to make a series of choices between hypothetical Smaller Sooner (SS) and Larger Later (LL) monetary payouts (e.g., $25 payout today vs $50 payout in 6 months). We observed a surprising range of choice preferences, with some students preferring the SS option almost to the exclusion of the LL option, as well as vice versa. Additionally, we observed that individuals that were less willing to wait had significantly higher response times. In a second experiment, we aimed to assess the effect of explicit-zero framing of choices on decision-making; we presented options that explicitly referenced the non-reward consequences of a choice (e.g., $25 payout today and $0 in 6 months vs $0 today and $50 payout in 6 months). Contrary to previously published work, we observed no effect of framing on discounting behavior. We also administered the Barratt Impulsiveness Scale (BIS) to assess self-reported levels of impulsiveness in the same sample of students. While many labs have assumed that delay discounting behavior is related to impulsiveness, we aimed to examine the strength of correlation with a separate widely used self-report measure of impulsiveness.

Poster 39: Sex Differences in Structural Brain Correlates of Internalizing Symptoms in Youth

Valentino Cheek 1, Gladys Venegas 2, Karim Ibrahim 2,3,4
Department of Neuroscience 1, The University of the South, Sewanee, TN, Yale Child Study Center 2, Yale School of Medicine, Department of Psychology 3, Yale University, Wu Tsai Institute 4, Yale University
Faculty Sponsor: Thomas Reppert

Internalizing symptoms and disorders are characterized by processes within the self and focus on internal expression of distress, such as anxiety, somatization, and depression. Internalizing disorders (anxiety and depressive disorders) are also highly prevalent globally and associated with negative health and social consequences. Transdiagnostic models suggest that internalizing and externalizing dimensions may have distinct and shared neural markers. However, few studies have examined if structural neural alterations are also related to sex differences in internalizing symptoms in youth. This study investigated the relationship between brain structure and internalizing symptoms, as well as sex differences in these associations, in a transdiagnostic sample of children. Sex differences in cortical volume and folding are associated with internalizing symptoms in children. Internalizing behavior was measured using the Child Behavior Checklist (CBCL) Internalizing Behavior Problems Subscale. For structural analysis preprocessing of T1-weighted images and surface-based structural analyses were conducted using FreeSurfer workflows. Sex differences in cortical volume and folding were found to be associated with internalizing symptoms in children. Three clusters showing sex

differences were observed: in the pericalcarine cortex, lingual gyrus, and supramarginal gyrus. In adolescent males the pericalcarine and lingual gyrus have both been shown to be highly active during attentional and visuospatial tasks, suggesting that attentional processes could be related to internalizing disorders.

Poster 40 (SPARC): The urgency to decide: Assessing inter-individual differences in sensitivity to the cost of time

Blake Burgiss, Frances McKay, Suzanne Cole, Thomas R. Reppert
Department of Psychology and Neuroscience Program, The University of the South, Sewanee, TN
Faculty Sponsor: Thomas Reppert

The present study intends to assess inter-individual differences in perceptual decision-making among undergraduate students. While we all share a common motivation to maximize possible reward, we often exhibit varying baseline levels of urgency that characterize our decisions. We designed and implemented a decision-making task to assess these differences in levels of urgency, and to explore urgency as a potential trait-like attribute of individuality. In the tokens task, participants watched a series of tokens move randomly to a leftward or rightward target, and made a choice as to which side would ultimately accrue the most tokens. We planned to assess the timing and vigor of participants' decisions as they completed the tokens task under a high cost of time (Fast condition) and low cost of time (Slow condition). To model the perceptual decision-making process, we implemented a basic version of the drift diffusion model (DDM) of evidence accumulation to a threshold. This model proposes that sensory evidence is combined with an urgency signal that grows during the decision process. This increasing urgency signal reduces the amount of evidence required to make a decision, resulting in less accurate choices. We used the diffusion model to make predictions about the effects of task context (fast vs accurate) and task difficulty (easy vs ambiguous) on decision time. We hypothesize that participants will show an increase in their decision speed when incentivized with a greater reward (arbitrary point value) during the tokens task. We also hypothesize that the response time and error rate variability will reflect individual differences in decision urgency.

Poster 41: Preparation and characterization of metal-amino acid complexes

Sanjana J. Priyonti, Anna L. Wright, Oleksandr Hietsoi, Gregory Ferrence, Evan E. Joslin, Robert E. Bachman
Department of Chemistry, The University of the South, Sewanee, TN
Faculty Sponsor: Robert Bachman

Complexes of divalent metal ions with individual amino acids, [M(aa)2] , have been studied for over four decades, with a variety of possible uses such as catalysis or anti-bacterial behavior suggested. Prior literature contains several synthetic protocols that generate variations in product formation. For example, some preparations for [M(aa)2] generate a cis geometry while others create the trans isomer. Our group is synthesizing a library of metal-amino acid complexes with a single synthetic protocol to explore questions related to geometry and possible reactivity patterns. In this process, we've determined new structures of four different metal-amino acid complexes.

Poster 42: Reactivity of platinum indazole complexes with potential anticancer activity

Bryan Beri, Harrison Satterfield, Sanjana Priyonti, and Robert E. Bachman
Department of Chemistry, The University of the South, Sewanee, TN
Faculty Sponsor: Robert Bachman

Cisplatin has been widely used in anticancer therapy for several decades; however, its severe side effects have driven the continued development of new platinum-based derivatives. As part of this exploration, complexes using a platinum(IV) center instead of the platinum(II) center of cisplatin have been developed as possible less toxic pro-drugs. The Bachman research group has created a series of novel indazole-based platinum complexes containing either a platinum(II) or a platinum(IV). These are hypothesized to exhibit anticancer activity like cisplatin with reduced toxicity. We have investigated the reactivity of several of these indazole-based complexes in hopes of intentionally controlling the oxidation state of platinum and utilizing this control for successful pharmaceutical development.

Poster 43: Generating Ligands and Catalysts through a Less Energy-intensive Method

Chloe Crawford, Zoe Napier, Evan Joslin
Department of Chemistry, The University of the South, Sewanee, TN
Faculty Sponsor: Evan Joslin

Amine-based N-heterocyclic carbene (Am-NHC) pincer ligands are utilized as ligands for transition metal catalysis due to their air-stability, strong σ-donor properties, and modifiable electronic and steric profiles. Traditional methods for Am-NHC ligands require refluxing for days, but microwave radiation can decrease the time to hours. Microwave reaction conditions were optimized for a range of imidazole and benzimidazoles, with a diverse range of electronic and steric profiles. NMR spectroscopy was used to characterize the compounds and showed the formation of disubstituted and monosubstituted products. The separation and isolation of the monosubstituted ligand allowed for the synthesis of an asymmetric Am-NHC ligand.

Poster 44: Porphyrin deprotonation using first row transition metals: synthesis of substituted metalloporphyrins

Chloe Crawford, Henry Hannah, Mary Grace Samp
Department of Chemistry, The University of the South, Sewanee, TN
Faculty Sponsor: Robert Bachman

Porphyrin is an important molecule within numerous biological systems, such as its role in processes like photosynthesis and cellular respiration. Porphyrin is a fascinating 18-electron conjugated π-system with interesting electronic behavior and also a rigid planar system with a central cavity capable of binding transition metals. In recent computational studies, the resulting metalloporphyrin shows promising results in assisting with the reduction of CO2 through electrochemistry. Within this research, we are coordinating various porphyin ligands to first row transition metals, so the resulting electrochemical properties of these new complexes can be compared both between themselves and with the computational results.

Poster 45: Metal Ion Sensing Using Carbon Quantum Dots

Haven I. Blair
Department of Chemistry, The University of the South, Sewanee, TN
Faculty Sponsor: Deon Miles

Carbon quantum dots (CQDs) are carbon-based nanoparticles that fluoresce under UV light. Our research explores the interaction between CQDs and metal ions, and the resulting changes in displayed fluorescence. Our CQDs are made using various water-soluble thiols and polycarboxylic acids. Specifically, mercaptosuccinic acid (MSA), ethylenediaminetetraacetic acid (EDTA), and tricarballylic acid (TCA) were used as the primary carbon sources, and urea (U) and tris(hydroxymethyl)aminomethan (Tris) were used as the nitrogen sources. Using microwave pyrolysis, various combinations of carbon and nitrogen sources were used to synthesize our CQDs, producing different types of carbon dots such as: MSA:U, EDTA:Tris, MSA:Tris, and TCA:Tris. The CQDs were then purified through centrifugation, fluorescent flash chromatography, and dialysis. The purified CQDs were then analyzed using several analytical techniques: UV-visible, fluorescence, and IR spectroscopy. When exposed to increasing concentrations of heavy metal ions, the CQDs intensity of fluorescence decreases, or is quenched. Metal ion sensing was used to explore this quenching interaction between CQDs and various metal ions, with Hg(II) and Fe(III) displaying significant quenching interaction. The analysis of these metal ions can be applied to future use in biological and chemical sensing technologies, such as water treatment and metal detection.

Poster 46: Exploration of Possible Future Sunscreen Metal Complexes

Haven Blair, Meredith Doi
Department of Chemistry, The University of the South, Sewanee, TN
Faculty Sponsor: Robert Bachman

Common sunscreen formulations often rely on UV-absorbing complexes structurally similar to dibenzoylmethane (DBM). This project explores the synthesis and characterization of metal-dibenzoylmethane complexes and their potential applications as sunscreen agents. By coordinating DBM with metals such as zinc and aluminum, we can analyze their influence on factors like UV-absorption, stability, and electronic structure. DBM is structurally similar to acetylacetonate (acac), which is well-studied and provides a useful framework in understanding ligand-metal complexes. Ligand variants with a strong electron-donating substituents and with a moderately electron-donating group were investigated. By comparing these metal–ligands, this project demonstrates how chemical modifications may impact photophysical behavior relevant to sunscreen performance.

Poster 47 (SPARC): Environmental "JELLO": Metallogelator Formation via Amide-Peptide Coupling as a Potential Treatment for Environmental Pollution

Lillian Boston, Stella Martin, and Ivy Wilson
Department of Sewanee Chemistry Department, The University of the South, Sewanee, TN
Faculty Sponsor: Robert Bachman

The use of xerogels in chemistry has become increasingly prevalent, as gelated compounds exhibit high porosity, large surface area-to-volume ratios, and tunable pore structures. As a result, xerogels have the potential to be applied in biomedical drug delivery, catalytic reactions, and environmental remediation. In this study, metallic and non-metallic xerogels were produced with the long-term aim of using these compounds as CO 2 reduction catalysts. For nonmetallic gelation, a double-tailed, glutamate-based lipid coupled to a variety of pyridine-related headgroups via the use of two different coupling agents–diethyl phosphocyanidate and propanephosphonic acid anhydride.

The resulting compounds were tested or gelation alone and then explored for their ability to form metallogels by the introduction of multiple metal ions, such as cobalt (II) and copper (II).

Poster 48: Investigating crystalline size and properties of titanium dioxide particles grown as dusty plasma

Hallie Revell, Bhavesh Ramkorun
Department of Physics, The University of the South, Sewanee, TN
Faculty Sponsor: Bhavesh Ramkorun

Titanium dioxide nanoparticles spontaneously grow in a nonthermal plasma containing an admixture of argon (Ar) and titanium isopropoxide (TTIP) . They grow linearly in size while being levitated in the plasma, until they reach a maximum size and can not be levitated anymore. For an Ar/TTIP plasma operating at 0.3 Torr, the particles grow for about 77 seconds. The maximum-sized particles are collected at the end, and analyzed using X-ray diffraction (XRD) and scanning electron microscope (SEM). The as-grown samples are amorphous but high temperature annealing crystallizes the samples into either anatase or rutile. The overall size of these particles decreases with the annealing, but the size of the crystals seemingly increases according to the Scherrer's equation. This may suggest that a crystalline core of titanium dioxide exists beneath an amorphous shell of weakly-bonded materials. We discuss how TTIP breaks down in the plasma and what may be the physical structure of the resulting nanoparticles.

Poster 49: Using Langmuir Probe to Measure Plasma Properties While Varying the Magnetic Field

Charles Pizzuti, Henry Hyden, Sonit Sisolekar, Bhavesh Ramkorun
Department of Physics, The University of the South, Sewanee, TN
Faculty Sponsor: Bhavesh Ramkorun

In a glow discharge nonthermal argon plasma, nanoparticles formed from acetylene undergo a growth cycle in which they reach a maximum size before being ejected from the plasma. This research is important because understanding and controlling this cycle helps monitor nanoparticle behavior during the manufacturing of advanced electronics, energy storage systems, and materials. When an external magnetic field is applied, the levitation time of nanoparticles decreases measurably. To investigate this, we used a Langmuir probe to measure electron density and electron temperature under both field-free and magnetized conditions. In the absence of a magnetic field (0 Gauss), the electron temperature is approximately 9.6 eV with an electron density of 1.2×10^{16} m^{-3}. Whereas, at 120 Gauss the electron temperature decreases to about 7.2 eV and the electron density drops to 9.05×10^{15} m^{-3}. From these measurements, we analyzed how changes in plasma properties affect the balance of forces acting on the nanoparticles. We found that applying a magnetic field reduces both electron density and electron temperature, indicating a decrease in the net upward force on the particles yielding a shorter growth cycle. Moving forward, we aim to refine these measurements and explore a wider range of magnetic field strengths to better understand this behavior.

Poster 50: Optical Emission Spectroscopy of Magnetized Argon Glow Discharge Plasma: Effects of Electron Temperature on Nanoparticles Dynamics

Abbie Buckner, Joseph Villaflor, John Wilson, Dr. Bhavesh Ramkorun
Department of Physics , The University of the South, Sewanee, TN
Faculty Sponsor: Bhavesh Ramkorun

In physics, plasma showcases complex interactions between charged particles, electromagnetic fields, and the particles' energy (temperature). Glow discharge plasmas have negative charge due to an excess of electrons which leads to an electric force that levitates nanoparticles. This study will examine how varying an external magnetic field strength influences the plasma excitation temperature and its resulting effects on the electric force. Optical Emission Spectroscopy (OES) is used to analyze emission lines from excited argon species. Spectral line intensities are processed through a Boltzmann plot analysis to determine the temperature. Changes in emission profiles are correlated to electron temperature as magnetic field strength varies. We have collected spectroscopic data at 0 Gauss and 2 Gauss, yielding electron temperatures of 4 eV and 5 eV, respectively. In this presentation, we will present further investigations utilizing magnetic fields of up to 500 Gauss. We will reveal how the plasma electron excitation temperature changes the forces that levitate particles in the plasma. This work is important because it will show that magnetic field control significantly influences nanoparticle synthesis via glow discharge plasma for various industrial applications.

Poster 51 (SPARC): From Classroom to Community: Improving Fire Department Operations with Modern Software Practices

Karim Morgan, Luke Broussard, Rashaun Williams, Bentley Cook
Department of Computer Science, The University of the South, Sewanee, TN
Faculty Sponsor: Ross T. Sowell

This project explores how applying the Software Development Life Cycle (SDLC) can improve the operational efficiency of volunteer fire departments through modern software engineering practices. Volunteer departments often operate with limited resources, outdated systems, and fragmented communication tools, creating opportunities for impactful technological intervention. To address these challenges, we contributed to the design and development of CommandEstablished, a web-based platform supporting emergency response operations. This work consists of three primary components: infrastructure and deployment workflows, data analysis, and system security. The infrastructure component focuses on CI/CD pipelines and automated testing to support reliable and maintainable software updates. The data analysis component transforms raw incident records into actionable insights by computing response time percentiles, staffing reliability, and apparatus utilization, benchmarked against NFPA 1720 standards. The security component introduces rate limiting and protective measures to improve system stability under varying usage conditions. Together, these components contribute to a more reliable and scalable system. ChatOps tools further enhance communication by enabling access to real-time information and workflow automation within messaging platforms, while security practices are integrated throughout development to protect sensitive data. This project is rooted in a community-driven approach, with Sewanee students collaborating with a local volunteer fire department to support real users. This partnership enhances departmental capabilities while providing hands-on experience in developing user-centered software. Overall, this work highlights how modern SDLC and DevOps practices can support critical community services.

Poster 52 (SPARC): Hate and Time: An Analysis of how White Supremacists Evolve to Survive

Victoria Quintero
Department of Politics, The University of the South, Sewanee, TN
Faculty Sponsor: Rae Manacsa

White supremacy has been embraced by organizations, modeling their doctrine and platforms after these ethnocentric ideas. These organizations sometimes radicalize and become violent, transitioning from a hate group to an extremist terrorist organization. These organizations have adapted their messaging to maintain this relevance with the general public. This change in messaging, also known as rhetoric, has evolved from direct violence to more casual, socially acceptable terms. Previous rhetorical research has primarily focused on American White Supremacist Extremist Organizations (WSE), indicating a gap in research of organizations outside of the United States. This project examines the rhetorical strategy of the Nordic Resistance Movement, a WSE organization based in Northern Europe. I used a theoretical framework drawn from American White Supremacist literature and applied it to the Nordic Resistance Movement to analyze differences in strategies. The analysis demonstrated that, like American white supremacist extremists, the NRM employs similar rhetorical strategies, including challenges to the public memory and the perpetuation of a "race war." However, it employs its challenges to the public memory through the use of a forward-facing myth of a "Nordic Nation" rather than American organizations' use of retroactive myths such as the "Lost Cause." These strategies, often going unrecognized in the public eye, play a critical role in the endurance of white supremacist ideology and organizations over time.

Poster 54 (SPARC): Suppression of the Voice: The Impact of Voter Restriction Laws on Racial Minority Voter Turnout in Southern Appalachia

Sophie Daniel, Lily Stooksbury
Department of Politics, The University of the South, Sewanee, TN
Faculty Sponsor: Clarissa Peterson

This research was conducted to attempt to discover a correlation between the recent influx of voter restriction laws in America and voter turnout from the Presidential election November 5, 2024, specifically attempting to see if minority voters were impacted (i.e. racial demographics per county). A meta-analysis was the approach of this study, composed of secondary data collected from the US Census for racial demographics, and voter turnout collected from the government websites from Alabama, Georgia, Kentucky, Tennessee, North Carolina, South Carolina, and West Virginia. Additionally, data was collected on the winning presidential candidate in each ACA county within the chosen states.

Poster 55 (SPARC): Art, Music, and the Politics of Black Liberation: Visual and Cultural Narratives in Beyoncé's Renaissance and Cowboy Carter

Chloe Middlebrooks
Department of Politics, The University of the South, Sewanee, TN
Faculty Sponsor: Cecilia Cejra

Advocates of Black liberation have long used artistic expression as a tool to challenge racial oppression and articulate visuals of political and cultural autonomy.This paper examines how contemporary popular music functions as medium to communicate Black liberation through an analysis of Beyoncé's albums Renaissance (2022) and Cowboy Carter (2024). Drawing on traditions of African American musical resistance that span from spirituals to hip-hop, this study explores how

music and visual performance create space for cultural critique, political expression, and individual formation. The paper focuses on how Beyoncé uses multiple aesthetic frameworks including Afrofuturism, Black queer ballroom culture, and the reclamation of historic Black contributions to country music, to construct narratives of Black identity and liberation. Using qualitative and archival analysis of song lyrics, music videos, performances, stage design, promotional materials, this research examines how both albums employ visual symbolism and musical storytelling to engage broader historical and cultural themes. This study will also use digital media archives that show audience interpretations and circulating online fan posts on social media applications including Youtube, Tiktok, Instagram, and X to examine how these narratives are interpreted by the public. Together these materials demonstrate how contemporary popular music can synthesize historical memory, speculative futures, and reclamation to articulate evolving visions of Black liberation.

Poster 56 (SPARC): Legal Status Pathways Reform for Undocumented Immigrants in the United States

Dante E Studenko Chamorro
Department of Politics, The University of the South, Sewanee, TN
Faculty Sponsor: Mila Dragojevic

The United States hosts over 11 million undocumented immigrants, including approximately 800,000 Dreamers, whose legal status remains precarious under the Deferred Action for Childhood Arrivals (DACA) program, a temporary measure that offers neither permanent residency nor citizenship. Rooted in the structural failures of the Immigration and Nationality Act of 1965 and decades of only enforcement-heavy policy, this legal uncertainty has an important contradiction. Undocumented immigrants constitute 18.6% of the U.S. labor force and contribute nearly $100 billion in annual taxes, yet they remain systematically excluded from federal benefits and legal protections they also fund. Enforcement mechanisms such as 287(g) agreements and Secure Communities have deepened exclusion by enabling racial profiling and debilitating community trust in public institutions and lawmakers. This poster presentation will summarize work from studying the American Dream and Promise Act of 2023 (H.R. 16) as a legislative framework and proposing an expanded and comprehensive reform built on three complementary pillars: a National Service Pathway to permanent residency, a federally coordinated Private Sponsorship Framework modeled after successful programs in Canada and Germany, and the removal of federal restrictions on in-state tuition for undocumented students. Assessed through effectiveness, efficiency, equity, and administrative feasibility criteria, this proposed reform demonstrates that an integration-centered approach produces more durable and equitable outcomes than enforcement-only models. Utilizing centralized federal goals alongside a decentralized, community-based implementation concept, this policy reframes undocumented immigrants, particularly Dreamers, from security threats to civic contributors deserving of permanent legal recognition and institutional investment.

Poster 57: Teachers' Resilience: A Scoping Review

Luke McLendon, Sherry Hamby
Department of Psychology, The University of the South, Sewanee, TN
Faculty Sponsor: Sherry Hamby

Background: Teachers at every level are subjected to a variety of adversities including burnout, secondary traumatic stress, compassion fatigue and general traumas that occur outside the workplace. Objective: This project reviews research on teacher's resilience using the resilience portfolio model as a theoretical framework. Method: We retrieved 1029 articles under the search teacher*

AND (resilience or resiliency or resilient or strengths) AND (trauma or abuse or adverse childhood experiences or childhood trauma or maltreatment) by using PsycInfo, Education Source and SocIndex through EBSCOHost, of which we are including 29 in this review. Results: The most significant contributors to teacher resilience are support from coworkers and administration, regulatory practices such as mindful meditation, and compassion satisfaction. Conclusion: Although the most commonly studied contributors to resilience are interpersonal connections, a variety of resources can help teachers manage and overcome adversities.

Poster 58: Down LLM Memory Lane: The effect of Human vs. AI Authorship on Memory

Louise Ferguson, Hieu Phan, Karissa Allmon, Allison Craft, Aidan Ganchan, Tianning Lyu, Abduldayam Maflahi, Marlin Price, Grace Stevens, Annie Hoffman, Maria Falikman
Department of Psychology, The University of the South, Sewanee, TN
Faculty Sponsor: Maria Falikman

The exponential rise of artificial intelligence-generated content in recent years has raised questions about how humans process and remember information based on its perceived source. Our study examined whether assumed authorship affects memory recall by testing the hypothesis that memory for human-authored text would be different from memory for text believed to be generated by a large language model. 120 Sewanee students were randomly assigned to read identical texts labeled as either human-authored or AI-generated, then completed a surprise memory test along with measures of recall confidence, text readability, likability, and engagement. We found higher memory recall in participants who believed they were reading a passage written by a human author, while participants who thought the story was written by an LLM recalled significantly fewer details. Participants also reported significantly higher engagement with a human-attributed text, though engagement did not correlate with memory performance. These findings suggest that perceived authorship influences memory recall independently of subjective engagement, with implications for understanding human-AI interactions in educational contexts.

Poster 59 (SPARC): Personal Reactions to Gendered Environments in an Undergraduate Campus

Charlotte Lee, Sydney Bixby, Camilla Mook, & Mich Arango-Rojas
Department of Psychology, The University of the South, Sewanee, TN
Faculty Sponsor: Terri Fisher

Gender minority status, defined as being outnumbered by another gender in a given context, may influence psychological well-being. This study examined whether imagining oneself as a gender minority would reduce self-esteem, assertiveness, and belongingness. Participants (N = 138) from a small liberal arts college in the southeastern United States completed baseline measures of self-esteem, assertiveness, and belongingness, followed by hypothetical gender-minority scenarios in academic, occupational, and athletic settings. Participants then repeated the measures. Paired t-tests revealed no statistically significant decreases in scores following the scenarios, failing to support the hypotheses. However, mean scores trended in the predicted direction, suggesting subtle effects. These findings indicate that hypothetical scenarios may not fully capture the psychological impact of gender minority status. Limitations include reliance on imagined situations and limited sample diversity. Future research should examine real-world gender minority experiences using behavioral and longitudinal methods to better understand how gendered environments influence psychological outcomes and belonging.

Poster 60: Capacity To Love: Differences by Gender?

Savannah Jetton, Stella Carradine, Maddie Loud, & Caroline Purselle
Department of Psychology, The University of the South, Sewanee, TN
Faculty Sponsor: Terri Fisher

This study examined gender differences in the capacity for romantic love among undergraduate students at a small liberal arts college in the southeastern United States. Capacity to love includes emotional investment, trust, shared goals, sexual passion, and responses to loss. Participants (100 women, 25 men; M age = 19.49) completed the Capacity to Love Inventory and the IPIP Capacity to Love Scale. It was hypothesized that women would report higher overall capacity to love and higher Common Ego Ideal scores, while men would report higher Permanence of Sexual Passion. One-way ANOVAs revealed no significant gender differences in overall capacity to love or these subscales. However, women scored significantly higher on the Loss and Mourning subscale. These findings suggest that men and women possess similar capacities for romantic love, challenging gender stereotypes and highlighting the importance of reconsidering assumptions about gender differences in emotional intimacy and romantic relationships.

Poster 61: Motivations for Hookups

Cate Sluser, Leah Conner, Sophia Caruso, and Madeline Thornburg
Department of Psychology, The University of the South, Sewanee, TN
Faculty Sponsor: Terri Fisher

Hookup culture is common on college campuses, yet gender differences in hookup motives and the role of risky sex expectancies remain unclear. This study examined gender differences in hookup motivations and associations with risky sex expectancies among undergraduate students at a small liberal arts university in the southeastern United States. Participants (N = 125) completed self-report measures assessing hookup motives (enhancement, social-sexual, relationship-seeking, coping, and conformity) and risky sex expectancies. It was hypothesized that men would report higher enhancement, social-sexual, and conformity motives, while women would report higher relationship-seeking and coping motives, and that risky sex expectancies would predict enhancement and social-sexual motives. Results partially supported these hypotheses. Men reported significantly higher conformity motives, suggesting greater peer influence on their hookup behavior, but no other gender differences emerged. Among women, stronger risky sex expectancies were associated with higher enhancement motives, whereas no significant associations were found for men. Overall, findings suggest that men and women share more similarities than differences in hookup motivations, highlighting the importance of social context and expectations in shaping college students' sexual behavior.

Poster 62: Hierarchical thematic coding of internal and external authenticity

Nelson Adams-Riley, Al Bardi, Matthew Schaublin
Department of Psychology, The University of the South, Sewanee, TN
Faculty Sponsor: Al Bardi

I participated in a qualitative research study examining how individuals articulate experiences of authenticity, inauthenticity, and self-transformation. Specific attention was paid to retrospective perceptions of personal meaning and agency within these written narratives. Using a hierarchical thematic coding system, we evaluated a dataset of narratives for the presence of themes related to authenticity, inauthenticity, communion, and agency, alongside a second set of themes derived from the SAFE model of person–environment fit. These two groups of themes reflect a conceptual

distinction between internal and external determinants of meaning: the former capturing aspects of the self as experienced and expressed, and the latter capturing conditions afforded by one's environment. By systematically applying these codes, we were able to analyze not only the presence of meaning-related themes, but also the relationship between internal states and environmental contexts. This contrast between personal and environmental dimensions provides a more nuanced framework for understanding how individuals experience authenticity. Our findings suggest that a sense of authentic being is not reducible to either internal disposition or external condition alone, but emerges through their interaction within narrative self-expression. I will be presenting a poster on the nature of each coding group and its relevance in the study of authenticity, the application of this relationship between environmental contexts, synthesized through the SAFE themes, and the internal states codes, and the significance of this facet of our findings.

Poster 63 (SPARC): Empowering Healthy Communities: Building Connections Between Community Members and Community Health Workers

Dr. Kathryn Morgan, Hannah Crawley, Mya Lopez, Luke McLendon, Madeline Thornburg
Department of Psychology, The University of the South, Sewanee, TN
Faculty Sponsor: Katy Morgan

Rural communities across the United States face persistent barriers to health equity. The Rural Health Resilience (RHR) project aims to improve access to health-promoting services across the Cumberland Plateau by building a coordinated transportation network that works alongside Community Health Workers (CHWs). This approach is based on research showing that transportation barriers can limit access to healthcare and other essential services (Syed et al., 2013; Wolfe et al., 2020). CHWs act as trusted community members who assess client needs, coordinate rides, make referrals, and support goal-setting and follow-up. Research shows that CHWs improve access to care, strengthen connections between patients and providers, and build trust in underserved communities (Perry et al., 2014; Viswanathan et al., 2010). This study uses a qualitative approach to understand how CHWs experience their role in the community. Data come from weekly reflection forms completed by CHWs over a six-month period. These reflections include open-ended questions about successes, challenges, learning, strategies, and key moments from their work. The data were analyzed in MAXQDA using thematic analysis. Responses were first organized based on the reflection prompts, then open coding was used to identify patterns across responses. Codes were refined and grouped to better understand connections between themes, capturing both shared experiences and day-to-day challenges. Preliminary findings reveal communication barriers between CHWs and community members, limited resources for unhoused individuals, and material constraints such as insufficient supplies. At the same time, CHWs identified opportunities for improvement, including developing more accessible informational materials, improving access to medical information, and providing support around financial literacy. Future directions include expanding resources based on community need, more intentionally integrating CHW perspectives into planning, and examining whether CHW engagement and mobility access improve trust and reduce health disparities in Grundy County.

Poster 64 (SPARC): Teen Voices, Teen Resilience: A Qualitative Analysis of a Youth Organizing Initiative

Dr. Kathryn Morgan, Mya Lopez, Luke McLendon, Madeline Thornburg
Department of Psychology, The University of the South, Sewanee, TN
Faculty Sponsor: Katy Morgan

Youth civic engagement is an important way that young people develop leadership skills, political efficacy, and a sense of collective resilience (Checkoway, 2011; Watts & Flanagan, 2007). However, youth in historically marginalized communities often face structural barriers, like limited support from local institutions and fewer opportunities to participate in formal politics, which can shape how they engage in civic life (Ginwright, 2010). Drawing on interviews with youth organizers in The Inland Congregations United for Change (ICUC), an organizing model that uses a multilevel structure with Local Organizing Committees that mainly involve high school students from low-income and immigrant backgrounds, this study explores how youth leaders experience resilience while doing organizing work in their communities. Using a qualitative approach, the YECO study conducted semi-structured interviews with 12 youth participants involved in ICUC. Interviews focused on their leadership experiences, challenges, motivation, and how they see their impact. The data were analyzed using thematic coding in MAXQDA, with a focus on ideas related to resilience, like dealing with setbacks, maintaining motivation, and staying hopeful. Through multiple rounds of coding, broader themes were identified across participants. The findings suggest that resilience is not just an individual trait but something built through relationships and shared experiences. Key themes included feeling empowered to use their voice, developing a sense of belonging, growing in confidence, and finding hope through local action. Many participants talked about how small wins helped them stay motivated, which connects to the idea of "critical hope" in youth organizing (Ginwright, 2010). This study contributes to community psychology and youth civic engagement literature by demonstrating how collective organizing models foster resilience among youth.

Poster 65 (SPARC): Sensory Sensitivities and Irritability in Adolescents with ASD: Assessing Parent-Child Rating Discrepancies

Amanda Shelton 1, Gabriella Pavlov 2, Chrysie Alexiou 2, Denis G. Sukhodolsky 2
1: Department of Psychology, The University of the South, Sewanee, TN, 2: Yale Child Studies Center
Faculty Sponsor: Kate Cammack

Autism Spectrum Disorder (ASD) often includes impairments in sensory perception, causing difficulty with regulation. Irritability is an impairing problem in children with ASD, and these behavioral outbursts may occur in response to sensory inputs. However, there are inconsistencies amongst parent and child reports of experiences, which creates challenges in accurately addressing externalizing problems, particularly in older children. This study aims to examine the association between sensory sensitivities and irritability, and to better understand the discrepancies between parent-rated and child-rated irritability.

Poster 66: An Island of Community and Strength: A Scoping Review on Puerto Rican Resilience

Mya Lopez, Sherry Hamby, Ph.D
Department of Psychology, The University of the South, Sewanee, TN
Faculty Sponsor: Sherry Hamby

Background: Individuals living in Puerto Rico face a multitude of adversities, many of which those within the Continental United States face, however they have the unique aspect of being a territory. Objective: This scoping review looks at research on the resilience of Puerto Ricans using the resilience portfolio model as a theoretical framework. Method: PubMed and PsycInfo were used to find articles containing the terms "puerto rico or puerto rican" and "resilience or resiliency or resilient or strengths or coping," resulting in 1986 articles, of which 36 were included. Results: Perhaps due to the collectivist nature of Puerto Rican society, many protective factors found related to interpersonal connections. Additionally, governmental policies regarding environmental disasters were also found to be important in several studies, pointing to factors in the environmental domain. Conclusion: Protective factors were found, and by focusing on interpersonal connections and government policies that focus on environmental disasters and connecting them within the Puerto Rican community, more can feel as though they can thrive.

Poster 67 (SPARC): The Link Between ADHD & Cannabis Use: Perceptions Versus Reality

Kate Cammack, PhD, Mariana Damron
Department of Psychology , The University of the South, Sewanee, TN
Faculty Sponsor: Kate Cammack

ADHD is a common mental disorder characterized primarily by inattention and hyperactivity/impulsivity and that affects over 6.5 million children and 15.5 million adults in the United States (Danielson, Claussen, Bitsko et al., 2024; Staley et al., 2024). Adolescence and young adulthood is also a common time for experimentation with drugs, with ˜10% of adolescents reporting recreational (subclinical) cannabis use (Sultan et al., 2023). Cannabis includes many psychoactive compounds, including THC (tetrahydrocannabinol) and CBD (Connor et al., 2021), with THC acting as an agonist at CB1 receptors distributed throughout the central nervous system (Chayasirisobhon 2020). Cannabis can induce a range of drug effects such as euphoria, heightened sensory input, increased appetite, and altered perception of time (Connor et al., 2021). In recent years, anecdotes within non-scientific communities suggest that cannabis is being used to self-medicate ADHD (Mitchell et al., 2016). In a compelling qualitative study, online forums discussions contained far more mentions of purported therapeutic effects of cannabis on ADHD or certain ADHD symptoms (e.g., inattention) in people with ADHD, compared to harmful or neutral effects (Mitchell et al., 2016). Importantly, the relationship between users' perceptions and actual therapeutic effects of cannabis remains unclear; it is also plausible that cannabis might impact non-symptom-related experiences of people with ADHD (e.g., isolation, stress coping). This poster discusses the neurobiology and psychology of ADHD, the mechanisms of action of THC, and relevant literature exploring the link between cannabis use and ADHD in humans and animal models. Implications for drug education programming and educational resources for people with ADHD will be discussed.

Poster 69: By the tapping on my door, something wicked this way soars: The ominous rendering of grief & isolation through Edgar Allan Poe's "The Raven" & Vincent van Gogh's "Wheatfield with crows"

Cler Sink
Department of English, The University of the South, Sewanee, TN
Faculty Sponsor: John Grammer

If there's a linear relationship between artistic mastery and mental instability, Edgar Allan Poe and Vincent van Gogh have broken the scale. Devoted passion, lonesome resilience, and utter tragedy are embedded in each poem and painting that came from their deranged consciences. Their works forged new, audacious paths that challenged the status quo of their era's artistic movements: Romanticism within literature and Impressionism within painting. As passionate as they were about their respective mediums, till their very last days, they didn't create them with the intent that their viewers or readers would see the works as reflections of their internal conflicts or past experiences. While both artists, Edgar Allan Poe and Vincent van Gogh, would have their general audiences believe that "The Raven" and Wheatfield with Crows are works objectively about loneliness, disarray, and ominous black birds, these works undeniably have a great deal to say about their creators' personal lives. "The Raven" and Wheatfield with Crows are inseparable from their makers' inner selves; they are a means through which the sufferings, fears, and convictions towards their respective artistic movements bleed through, and their intentional choices of forewarning black birds act as predictors of death, even when the originators don't realize it.

Poster 70 (SPARC): The Impact of Narrative Humility on Medical Trauma

Annie Colbath
Department of American Studies, The University of the South, Sewanee, TN
Faculty Sponsor: Sean Patrick O'Rourke

In this thesis, I study the writings and speeches of Dr. Abraham Verghese and I address how his practice of medicine highlights empathy and connection to create a Ritual out of the doctor-patient relationship that is essential to his ability to treat his patients. I root my analysis in the theory of Narrative Humility, which describes the importance of listening to a patient's narrative as the basis for building connection in the doctor-patient relationship. I use three themes in my analysis, which are ritual, narration, and empathy. This thesis argues for a concerted effort within the medical community to take faith in the power of Dr. Verghese's ritual.

Poster 71: Examining Geographic Ancestry and Oral Health through Human Skeletal Analysis

Camden Andrade, Fiona Kiernon, Carley Gilbert, Kae Massey, Jenna McAmis, Ethan Roldan
Department of Anthropology, The University of the South, Sewanee, TN
Faculty Sponsor: Emily Sharp

In this study, we will be examining a human skeleton housed with the skeletal anatomy collections at Sewanee. We do not know much about the history of this skeleton's arrival at the university or any information about the individual. Through morphological and metric assessments of skeletal and dental characteristics, we will assess geographic ancestry. Through morphological observations of the dentition, we will assess the oral health of the individual. We anticipate results presenting dentition without pathological antemortem changes, as many procurers of teaching skeletons wanted them to have standardized traits across a wide range of geographical ancestries. For geographic ancestry, teaching skeletons in the 20th century historically have been predominately acquired from

India or China through British colonial networks, therefore we assume this individual's geographic ancestry will be consistent with these regions. In our estimation of the individual's geographic ancestry and assessment of their dental condition, we attempt to reconstruct the individual's past lifeways to form an osteobiography that connects the physical skeleton back to their identity in life.

Poster 72: Estimating Biological Sex and Age at Death Using Osteological Methods
Suzanne Cole, Lillie Custer, Isabella Fioretti, Kelly Firesinger, Hunter Hitchens, VéVé Rice
Department of Anthropology , The University of the South, Sewanee, TN
Faculty Sponsor: Emily Sharp

An individual's life course is mapped onto their physical body. Using metric and nonmetric methods typical of biological anthropology, we hope to reconstruct the identity of an individual used as a teaching skeleton for human anatomy courses at Sewanee. Our investigation will include determination of biological sex and age at death. We expect the individual's age to be consistent with young adult to middle age, as is typical of teaching skeletons. Since sexually dimorphic traits are present after puberty, we should be able to determine biological sex using morphoscopic traits of the skull and pelvis. Determining these elements of the biological profile will help us identify the individual and provide a more complete picture of their life experience. This poster may include images of human skeletal remains.

Poster 73: Rethinking History: Understanding the History of Teaching Skeletons at The University of the South
Kendoll Hayes, Tate Malone, Rowan Pollard, Caroline Rayson, Ayre West, Meredith Williams
Department of Anthropology , The University of the South, Sewanee, TN
Faculty Sponsor: Emily Sharp

The University of the South: Sewanee uses human remains to fulfill part of its core learning objectives, and we examine one individual that is used as a teaching skeleton. This individual has been under the University's care for an unknown period. The University has a history of medical schooling and nursing, raising questions about the individual's origin, purchase, and medical processing. Teaching skeletons undergo frequent alterations and maintenance due to their heavy use in educational environments. Understanding the processing the individual underwent will allow us to narrow the time period during which they were initially acquired by the university. This project will assess stature using linear regression formulae based on long bones, archival combing, and postmortem alterations, and will reconstruct the individual's identity using metric and morphological methods. This poster may include images of human skeletal remains.

Poster 74: Facilitating the Evaluation of Repertoire for Collegiate Vocal Students
Louise Block
Department of Music, The University of the South, Sewanee, TN
Faculty Sponsor: Kerry Ginger

As of the time at which this research is published, no standard system of repertoire assignment exists in the United States upon which voice teachers may rely; instructors have largely been obliged to utilize their own judgement for assignment. A personal knowledge of their students' abilities greatly assists teachers in this endeavor, but a poor choice of song assignment, whether by accident or by ignorance, may discourage a young singer's interest in music, frustrate their efforts to improve, or even harm their instrument. The research undertaken was intended to synthesize

different challenges posed by vocal works into a definitive set of criteria which, when applied to a vocal work, near-objectively indicates the difficulty level of said work. Concerns addressed in the criteria were both artistic (e.g. subject matter) and technical (e.g. tessitura). Research resulted in a unified rubric designed to assess the diverse challenges a piece of vocal music may pose. This rubric was then applied to a small selection of classical works, resulting in a "ranking" of each song by relative difficulty. One of the songs evaluated was then assigned to a hypothetical student, considering said student's skill level, needs, and musical interests. The standards organized into the rubric will introduce a degree of objectivity into the vocal classroom, streamlining the time- and thought-intensive process of choosing appropriate repertoire for students of different backgrounds and levels of experience. With this scale, teachers may with less difficulty accentuate students' strengths, observe and remedy students' weaknesses, and encourage in them a passion for music. The collegiate vocal student may also benefit intellectually from this rubric, keeping its tenets in mind as they go on to choose repertoire for themselves.

Poster 75: The Music of Contemporary Musical Theater: A Rubric for Assessment

Hannah Diehl
Department of Voice Department, The University of the South, Sewanee, TN
Faculty Sponsor: Kerry Ginger

One of the most beautiful things about music is the variety that can exist in millions of songs, each melody and each voice being different from the next. It is recognized that each individual has their own vocal strengths and weaknesses; when teaching a vocal student it is crucial to evaluate these strengths and weaknesses and be able to efficiently and effectively assess pieces to give the student to work on. The focus of this project is to create a system of analyzing music to find the most developmentally efficient song for a vocal student to learn. To carry out this study, I focused on the genre of contemporary musical theater and selected three songs from a popular anthology, 21st Century Musical Theatre: Women's, 2nd Edition. After developing a rubric that analyzes the pitch, rhythm, phrasing, articulation, language, and register of the song and singer, I was able to select one of the three songs to assign to a hypothetical student. After assessment, the chosen song is representative of both the individual's strengths and weaknesses, allowing them to feel comfortable while continuing to grow in their instrument. While this study focuses on a singer at the collegiate level, this study provides a uniform way for voice teachers or professional vocal performers to find music that suits their needs. When an instructor or individual recognizes aspects of the voice that needs strengthening, this rubric provides a way for that individual to select a handful of songs and quickly analyze them. Depending on the capabilities of the individual and what their growing points are, the singer can quickly place the songs in comparison and select one that fits their needs. Overall, the rubric saves time for the singer and singing teacher, allowing more time for the musician to rehearse the music and continue to grow.

Poster 76: Amy Winehouse Repertoire For a Contemporary Vocalist

Kourtni Hamilton
Department of Music Department , The University of the South, Sewanee, TN
Faculty Sponsor: Kerry Ginger

How should a voice teacher assess a student's singing abilities and assign repertoire which honors the prior experiences they've had with music? The purpose of this project was to act as a voice teacher and select three pieces from a contemporary anthology that aligns with the interests of an avocational adult participating in vocal lessons. Stipulating that the student's musical interests

are in contemporary music, I selected three pieces from Amy Winehouse's album, "Back to Black." I created a rubric enumerating different elements of the difficulty level of the songs, enabling me to analyze the rhythm, pitch, tempo, harmony, and more. My methods included creating my own rubric to assess the repertoire and applying it in light of the student's singing abilities, with the ultimate goal of enabling the student's own artistic expressions to make it unique to them. This research adds insight to the dialogue around assessing and assigning repertoire for vocal students. It also shows the numerous ways in which voice teachers can explore vocal techniques and build relationships with students by selecting songs that align with their interests and help their voices develop over time.

Poster 77 (SPARC): You Wanna Sing What?! Selecting Developmentally Appropriate Repertoire for the Adolescent Voice

Arden-Grace Gipson
Department of Music , The University of the South, Sewanee, TN
Faculty Sponsor: Kerry Ginger

Often in the vocal studio there arises a challenge when a voice teacher, whether seasoned or green, picks out repertoire for a student in the inflection point of adolescence. Traditional teachers tend to draw on a very specific catalogue of songs they have found over the years to be appropriate for voices at this stage of development; however, these collections may be older compositions, and have become the standard repertory for this level of singers, thus lacking in variety and individuality. For newer teachers of adolescent students the challenge is to find songs that are suitable, and they may end up assigning songs that are too difficult, leading to poor execution of these songs and, possibly, unhealthy habits as students strive to achieve particular effects outside of their abilities. The goal for this project, then, was to create a rubric for analyzing difficulties within vocal works, a standard scale of difficulty which could be applied to any piece of vocal music in order to determine the suitability of music for a specific student. To further this goal, I evaluated and thoroughly assessed a sampling of pieces from a representative anthology of vocal music for musical aspects that would determine their level of difficulty, such as melismatic vs. syllabic writing, phrasing, language and diction challenges, melodic contour, and rhythm. I used the rubric I had created based on assumed difficulty and applied it to three pieces within the anthology to estimate their level of difficulty. This work and rubric will be useful to the larger field of vocal pedagogy and to teachers of singing as a guide to help them better select appropriate repertoire for their students during such a wonderful and uncertain time in their lives.

Poster 78 (SPARC): Intercultural relationships between the Roman Empire and Votadini of Lower Scotland in the Early Common Era

Striker Alvis
Department of History , The University of the South, Sewanee, TN
Faculty Sponsor: Susan J Ridyard

From 43 CE to 410 CE, Britannia (modern United Kingdom) was under the rule of the Roman Empire. Mainstream historical research characterizes this period as a continuous conflict between the native tribes of the island and the Roman military. However, literary and archeological evidence indicates cross cultural interactions and diplomacy between Votaldini tribe of the Scottish Lowlands and the Romans did occur. Through the analysis of Archeological data found in and around Modern day Edinburgh, Roman artifacts found in native settlements, Tacitus recounting of Agricola's time as imperial governor of Roman Britannia, the continued independent functioning

of Traprain Law under Roman rule, as well as the Votadili tribe becoming an allied state to the Romans following the permanent abandonment of The Antonine Wall, it will be argued that the Roman military did not intend to complete a complete conquest of the Scottish lowlands, rather they intended to work diplomatically with allied natives in order to protect the lands south of Hadrian's wall from Caledonian and Pictish attacks from the highlands.

Poster 79 (SPARC): Los Nazis en México: The Untold Relationship Between Mexico and Anti-Nazism

Dylana Najera Rios
Department of German, The University of the South, Sewanee, TN
Faculty Sponsor: Liesl Allingham

This research project seeks to bring light to the largely overlooked history in Mexico and explores anti-fascism and anti-Nazi propaganda posters created by Mexican artists, situating these works within broader traditions of political art, propaganda studies, and transnational resistance movements. This project will expand on the current literature that rarely addresses Mexico's explicit cultural opposition to fascism or the global circulation of its anti-Nazi imagery. By analyzing propaganda posters created by Mexican artists, including political cartoonists, state-sponsored illustrations, and members of anti-fascist cultural leagues, this study brings new attention to Mexico's role as one of the most outspokenly anti-Nazi countries in Latin America. This project combines archival research, visual analysis, and historical context to assess how Mexican artists used design, symbolism, and rhetoric to denounce totalitarianism. Additionally, this research touches up on the unity between the United States and Mexico through a joint effort in aerial combat against a global threat. It further explores underlying social, cultural, and moral issues expressed through these posters, such as anxieties about authoritarianism, solidarity with refugees, and the belief that art served as a moral tool in global political struggles. The major impact of this project lies in recovering and interpreting a visual archive that demonstrates Mexico's cultural agency on the world stage during World War II. The findings reveal how Mexican artists shaped public opinion, fostered anti-fascist identity, and contributed to hemispheric efforts against Nazism, which challenged assumptions that Latin American involvement was passive or nonexistent. Target audiences include scholars of Latin American history, art history, political communication, diplomacy, and students interested in global anti-fascist movements. By emphasizing Mexico's creative resistance to Nazism, this research enhances understanding of the interconnectedness of art, politics, and ideology, enriching the field with a more inclusive and transnational narrative of anti-fascist cultural production. Keywords: Mexico, anti-fascism, Nazis, propaganda posters

Poster 80 (SPARC): Let's Get Blitzed? Performance Enhancing Drugs in National Socialism and their Pop Culture Afterlife

Anna Lee Puryear
Department of German and German Studies, The University of the South, Sewanee, TN
Faculty Sponsor: Liesl Allingham

This research project seeks to analyze the ways in which the use of performance enhancing drugs such as Pervitin and Methamphetamines during the German National Socialist Era has influenced contemporary pop culture depictions within the genre of Nazisploitation and the public's understanding of Nazis. This project assesses how historical understanding and documentation of the German military's use of methamphetamines on soldiers has produced common media tropes such as mad Nazi scientists, zombies, and super soldiers within the contemporary pop culture landscape.

It also considers how the controversy surrounding drug use as a taboo subject contributes to the appeal of Nazisploitation media, as it constructs Nazis as simultaneously nearly invincible superhuman threats and drug-addicted human ruins. This thus affirms and constructs viewers' identities as they find themselves not only victorious against superhuman strength and cunning, but also morally superior over a threat that has been deemed the epitome of evil. Effective spectacles such as these thus compel audiences to repeatedly return to this genre as they seek this satisfying confirmation of their own superiority and humanity over that of the dehumanized Nazi. Ultimately, my research examines the spectacle of transgressive drug use by the Nazis and its role in constructing the American post-war identity and morals through media representations and superficial caricatures.

Poster 81 (SPARC): The FBI and the Branch Davidians: An Analysis of Policy, Miscommunication, and Tragedy at Waco.

Lily Carter, Madelyn Ryan
Department of Religion , The University of the South, Sewanee, TN
Faculty Sponsor: Kati Curts

How involved, if at all, should the American government be in the regulation of religion? This question has driven significant study in American religion and politics, especially in conjunction with queries into the parameters and limits of religious freedom. Much of this study has demonstrated the reality of government brutality particularly among minority and minoritized groups. This project draws upon a case study of the Branch Davidians led by David Koresh, and their standoff with the FBI in 1993, in order to re-examine the role of the FBI in the mass deaths that resulted. What does justice look like in the context of non-normative religious groups, and how do we wrestle with the extent of American religious freedom? Our project uses existing research on the Branch Davidians with specific attention to the 1993 standoff in Waco. It implements surveys conducted on public response to the raid, along with historical analysis of FBI documents from the FBI archives. Ultimately, we contend that this case study on Waco reveals how small, non-normative religious groups struggle with detrimental social and governmental scrutiny. These conflicts can– and in the case of Waco did– result in dangerous consequences. Our project aims to increase awareness of these lesser-known biases, while improving the willingness to understand other ways of life in the U.S. By taking the time to reflect upon these kinds of cases and the consequences they bring, we can avoid similar tragedies in the future.

Poster 82: A Metaphysical Approach to Emptiness

Zoe Napier, Petey Peterson
Department of Religious Studies, The University of the South, Sewanee, TN
Faculty Sponsor: Tam Parker

This project will be a metaphysical exploration of what different interpretations of emptiness means. Integrating different disciplines with religious studies, ecology, and chemistry, we will explore Buddhist and neo-materialist thought and provide examples of different interpretations of emptiness. We redefine what emptiness means within an ecological and chemical perspective, focusing on the ways that a thing's physical and metaphysical context structures its emptiness. This poster seeks to explore our understandings and interpretations of emptiness through time, matter, and intangible self. We attempt further discussions on how different approaches to emptiness reveal nuance present throughout disciplines and mediums. An interdisciplinary investigation of emptiness reveals the implicit assumptions of matter, time, and self as inert and/or agential. These three concepts will

guide our analysis of emptiness through their connections to both the physical and the metaphysical. The relative view of each of these as either tangible or intangible will illuminate the falsity of the meta/physical binary.

Poster 83 (SPARC): The Influence of Foreign Students on Domestic Student STEM Degree Completion Rates

Ruth Neven & Nicole Radford
Department of Economics, The University of the South, Sewanee, TN
Faculty Sponsor: Tao Song

Using Integrated Public Use Microdata Series USA data from 2011-2023, we estimate the relationship between foreign student density in U.S. metropolitan areas and domestic students' STEM bachelor's degree attainment using a linear probability model with city and year-fixed effects. We find that a larger presence of foreign STEM students is associated with a lower likelihood that domestic STEM students earn a bachelor's degree. The results and conclusions are robust to using Public Use Microdata Areas instead of metropolitan areas. This is consistent with the theory that the presence of foreign students in STEM could crowd out domestic students in attaining STEM degrees.

Poster 84 (SPARC): The Effect of Public Funding for University R&D on Economic Growth

Maren Johnson
Department of Economics, The University of the South, Sewanee, TN
Faculty Sponsor: Marc St-Pierre

Federal investment in university research and development has grown substantially in recent years, reaching tens of billions of dollars, but the effects on state-level economic growth remain less understood. This study quantifies the effect of those federal dollars on state GDP growth, with the hypothesis that as federal funding increases, university outputs increase, leading to a growth in GDP. The mechanism of this relationship is that higher federal investment increases university research outputs, increasing total factor productivity and ultimately driving economic growth. This study analyzes all 50 states plus Washington D.C. from 2006-2019 and measures the relationship between federal funding for university research and development and growth in GDP per worker in each state. The data for the key independent variable, federal investment in university R&D comes from the Higher Education Research and Development Survey from the NCSES. This study adapts the Solow model of economic growth and uses state fixed effects to estimate the impact of federal funding on GDP growth at a state level. The model estimates that a 1% increase in federal funding for university R&D leads to a 0.0281 percentage point increase in GDP per worker, significant at the 1% level, which is an approximately 3.6% increase when compared to the average growth rate.

Poster 85 (SPARC): The Effects of Medical Marijuana Laws on Opioid Overdose Mortalities

Leah Smith
Department of Economics, The University of the South, Sewanee, TN
Faculty Sponsor: Tao Song

This study seeks to analyze the impacts of medical marijuana laws on opioid overdose mortality rates using a panel dataset of all 50 U.S. states and the District of Columbia from 2000 to 2019.

Employing a version of the difference-in-differences with multiple time periods regression model from Callaway and Sant'Anna (2021), we control for several socioeconomic factors and estimate the average treatment effect of adopting states compared to never adopting states. Contrary to prior research findings, our results indicate that adopting states experienced a substantial increase of up to 234% in opioid related deaths after adoption, compared to never-adopting states. The findings suggest that legalization alone may not be enough to combat opioid related harms.

Poster 86: The Effect of Birth-Order on Educational Attainment

Sophie Bolyard, Hughes Maddrey
Department of Economics, The University of the South, Sewanee, TN
Faculty Sponsor: Marc St-Pierre

This paper examines the effect of birth order on educational attainment using data from the Wisconsin Longitudinal Study (WLS), a long-term survey of over 10,000 Wisconsin high school graduates from the class of 1957 and their siblings. The analysis focuses on whether later-born children completed fewer years of education than their earlier-born siblings after controlling for parental education, household income, family size, parental age, and child characteristics. We estimate two regression models: the first model uses a continuous measure of birth order, and an expanded model that includes birth order indicator variables, interactions between birth order and sex, and nonlinear versions of several parental and family characteristics. Each model controls for a wide set of individual and family level characteristics to ensure that the estimates reflect birth order rather than background differences across children and families. Both models also include birth-year effects to account for cohort variation. Across the two models, there is a consistent and statistically significant negative relationship between birth order and years of completed education. Parental education and household income are positively associated with children's educational attainment, while maternal age at birth also shows a positive effect. These findings provide empirical evidence of consistent within-family differences in educational attainment by birth order.

Poster 87: ROIC strategy for superior risk adjusted returns

George Smalley and Harrison Mabry
Department of Finance, The University of the South, Sewanee, TN
Faculty Sponsor: Huarui Jing

This paper evaluates a concentrated five-stock portfolio constructed using Return on Invested Capital (ROIC) as the primary screening criterion. Our aim is to design a rigorous quality-focused strategy: requiring ROIC above 12%, strong free cash flow, yields, investment-grade credit ratings, and durable competitive moats. Our research question then is simple. Can we generate superior risk-adjusted returns relative to the S&P 500? Our Portfolio holdings span four economically distinct sectors. Technology (Microsoft, Alphabet), Defense (Lockheed Martin), Financials (Berkshire Hathaway), and Healthcare (Eli Lilly). We apply Modern Portfolio Theory (MPT) to determine optimal weights, the Capital Asset Pricing Model (CAPM) to assess systematic risk and alpha. The February–April 2026 investment period is characterized by moderate inflation (˜2.5–2.8%), a federal funds rate of 3.5–3.75%, and heightened geopolitical uncertainty. Our portfolio targets annualized returns of 13–16%, a Sharpe ratio at or above 1.0, and a portfolio beta at or below 1.0. Preliminary CAPM results reveal positive alpha for three of five holdings, supporting the hypothesis that high-ROIC businesses earn returns above those predicted by market exposure alone. Tracking data so far has shown a mixed result, as performance has shown downside protection only sometimes.

Poster 88: Enhancing Risk-Adjusted Returns Through Profitability-Based Equity Selection and Cross-Sector Mean-Variance Optimization

Gavin Stallings, Ryan Moll
Department of Finance, The University of the South, Sewanee, TN
Faculty Sponsor: Huarui Jing

This paper evaluates whether a sector-diversified equity portfolio can improve risk-adjusted returns relative to the market, proxied by the S&P 500, through profitability-based stock selection and mean-variance optimization. The strategy is implemented in two stages. First, firms are screened based on persistent profitability, earnings stability, disciplined capital allocation, and demand resilience. Second, the selected firms are combined into a portfolio with weights determined by mean-variance optimization, with additional evaluation using the Capital Asset Pricing Model (CAPM). Monthly return data over both five-year and one-year windows are used for analysis. The results indicate that the optimized portfolio outperforms the S&P 500 ETF in both raw return and Sharpe, driven by a balance between high-growth technology exposure and lower-volatility defensive equities.

Poster 89: Optimizing the U.S Aerospace & Defense Sector: Utilizing Large-Cap Stocks with Arms Revenue and Defense Contracts

Ryan Nichol, Luka Stojkovich
Department of Finance, The University of the South, Sewanee, TN
Faculty Sponsor: Huarui Jing

This paper analyzes theoretical frameworks and performance of a five-stock portfolio in the U.S. aerospace and defense sector, with a focus on large-cap companies that capitalize on arms revenue and defense contracts for sustainable profits and stock performance. The U.S. aerospace and defense sector has seen consistently strong stock performance that subtly outperforms the S&P 500 in varying market conditions. Stock performance in the sector is often linked to geopolitical and broader macroeconomic factors, but our project provides theoretical frameworks and firm-specific analysis that reveals other factors can be considered for both long and short term stock performance. Our portfolio incorporates Modern Portfolio Theory, Capital Asset Pricing Model, Fama-French Multifactor Model, and firm-specific Discounted Cash Flow models to achieve goals of outperforming the S&P 500 and the ITA Aerospace and Defense ETF in both short and long term timeframes. Our portfolio has achieved positive returns while the S&P 500 and ITA have seen significant negative returns during the holding period. This research establishes an investment strategy that can consistently outperform the market and other sector portfolios in varying market conditions.

Poster 90: A Cross-Sectional Ranking Framework for Financial-Characteristic Based Portfolio Construction

Elias Becker and Cameron Simons
Department of Finance , The University of the South, Sewanee, TN
Faculty Sponsor: Huarui Jing

This paper constructs and analyzes a five-stock portfolio built through a disciplined, cross-sectional ranking framework grounded in empirically supported financial characteristics. Potential firms are scored across five categories; valuation (earnings yield), profitability (ROIC), momentum (12-1 month), investment discipline (capEx/sales), and leverage control (debt-to-assets), using a weighted composite percentile ranking applied to major U.S. listed common stocks. The top-ranked firms

are then narrowed down through return-correlation and risk-return analysis to a final portfolio of GE Vernova, HSBC Holdings, KLA Corporation, Lam Research, and Newmont Corporation. Portfolio weights are determined using Modern Portfolio Theory to maximize the Sharpe Ratio along the Capital Allocation line, then adjusted using CAPM alpha and beta estimates and firm-specific review. The performance of our portfolio is analyzed against the S&P 500 on a risk-adjusted basis. Over the tracking period from January 16 to April 17, 2026, the justified-weight portfolio returned approximately 10.73% against a 1.42% decline in the S&P 500, outperforming the benchmark by roughly 12 percentage points. CAPM regressions produced a positive alpha for all five holdings, supporting the conclusion that the composite ranking framework identifies return-generating characteristics beyond systematic market exposure.

Poster 91: A Healthcare and Consumer Portfolio Focused on Medical Cannabis Reclassification: A Multi-Factor Fundamental Investment Analysis

Aidan Goulding, Charlie Williams, William Cooper
Department of Finance, The University of the South, Sewanee, TN
Faculty Sponsor: Huarui Jing

Abstract The goal of this paper is to construct and evaluate a sector-diversified, low beta multi-factor based investment portfolio that combines healthcare and consumer sector securities, with a specific emphasis on medical cannabis exposure due to the proposed reclassification of cannabis from a Schedule I to a Schedule III controlled substance. The portfolio hypothesis is that pairing a high-growth, policy-sensitive sector with a low-covariance consumer sector reduces overall volatility while preserving upside potential. Stocks are selected using factor-based screening criteria, including return on equity, revenue growth, profit margins, and debt-to-equity ratios, applied to over 1,000 securities. Portfolio weights are then optimized using Modern Portfolio Theory, the Minimum Variance Frontier, the Sharpe Ratio, and the Capital Asset Pricing Model to assess systematic risk through beta and excess return through alpha. The portfolio consists of Costco, Procter & Gamble, Novartis, Exelixis, and Jazz Pharmaceuticals, achieving a Sharpe ratio of approximately 1.3 and a return of approximately 1.7% from January to March 2026, and outperforming the S&P 500 by 7.7 percentage points over the same period. The results suggest that disciplined sector diversification combined with factor-based selection and macroeconomic awareness can produce a resilient, market-beating portfolio under volatile regulatory and economic conditions.

Poster 92: Capitalizing on the AI Infrastructure Boom: An Asset Pricing Approach to Industrial Investment Strategy

Mac Elliott, Thomas Calame
Department of Finance, The University of the South, Sewanee, TN
Faculty Sponsor: Huarui Jing

This paper analyzes the construction and performance of a five stock portfolio focused on firms that benefit directly from artificial intelligence-driven capital expenditures, with an emphasis on physical infrastructure sectors such as semiconductor manufacturing, data center power and cooling, and electrical grid expansion. Unlike traditional investment strategies that target artificial intelligence software or other end user applications, this portfolio focuses on the underlying infrastructure required to support the deployment and scaling of AI technologies. As investment in artificial intelligence continues to accelerate, with large technology companies committing hundreds of billion dollars towards the development of infrastructure, companies positioned within these supply chains are expected to experience continued demand and revenue growth. Our portfolio introduces a

framework for stock selection based on exposure to the capital expenditure cycles, prioritizing firms whose revenues are tied to long term, sustained infrastructure investment rather than short term consumer demand. The portfolio is constructed using detailed macroeconomic analysis, sector specific screening criteria, and firm level financial data, with the objective of outperforming the Industrial Select Sector SPDR Fund (XLI). As well as the XLI we will include the semiconductor index (SOXQ) that tracks the performance of companies involved in the design, manufacturing, and distribution of semiconductor chips. While it provides direct exposure to AI-related demand, it represents only one segment of the broader AI infrastructure value chain and does not capture other critical areas such as power, cooling, and data center development.To evaluate performance, we apply Modern Portfolio Theory (MPT), the Capital Asset Pricing Model (CAPM), and the Fama-French Five-Factor Model to determine whether the strategy generates excess returns after controlling for systematic risk. By aligning the portfolio exposure with sustained capital investment trends, this research provides a structured approach to capturing value from the ongoing expansion of artificial intelligence infrastructure.

Poster 93: A Strategic Growth Approach to Managing a Dividend-Equity Stock Portfolio

Owen Andress, Jake Walling
Department of Finance, The University of the South, Sewanee, TN
Faculty Sponsor: Huarui Jing

This paper studies the formation of a five stock portfolio strategy that focused on stocks that pay dividends while also offering capital appreciation through equity growth. A dividend-equity strategy is a very stable strategy as it focuses on stocks with very strong financials. These companies will also be able to pay investors regular dividend payments while also offering them equity growth. This paper outlines the framework in choosing the five-stocks for this portfolio. The goal for this portfolio is to beat the S&P 500 as well as realizing smaller risk, and allow for investors to receive a consistent income from dividend payments. Our strategy and stocks for our portfolio are chosen through macroeconomic analysis, risk and return analysis, Modern Portfolio Theory, and the Capital Asset Pricing Model. Through this research and analysis our portfolio has beat the market, although showing negative returns, and has shown better risk-adjusted returns. This research showcases a framework to construct a portfolio that is focused on creating a consistent income stream as well capital appreciation.

Poster 94: Precision Investment Within the AI Value Chain

Charles Moran, Niko Maheras
Department of Finance, The University of the South, Sewanee, TN
Faculty Sponsor: Huarui Jing

This paper develops an investment strategy structured around infrastructural bottlenecks within the AI value chain. As AI adoption continues to accelerate, both the implementation and expansion of AI is constrained not by demand, but by the capacity of supporting infrastructure. We argue that we have identified three key constraining factors that position themselves in areas of leverage. Such leveraged positions provide both above market-risk adjusted returns as well as diversified exposure across three sectors. Our portfolio is composed of NVDA, Taiwan Semiconductor Manufacturing Company, Caterpillar, Trane Technologies, and Constellation Energy. Using Modern Portfolio Theory, Capital Asset Pricing Model (CAPM), and the Fama-French five factor model, we evaluate expected returns, systemic risk, and factor exposures within AI investment as well

as external exposure. Unlike historic capital expenditure cycles, specifically around technological booms, AI-related investment has remained resilient despite periods of elevated interest rates and demanding expected return on investment. This sustained fiscal belief in AI suggests an economic structural shift with robust capital deepening, rather than a speculative cycle. By investing in AI infrastructure bottlenecks, our portfolio offers a unique strategy that balances high-growth exposure with reliable industrial support.

Poster 95: Investing in Climate and Infrastructure: A Weather-Driven Equity Portfolio Strategy

Thomas Powers, ShayAnn Conn
Department of Finance, The University of the South, Sewanee, TN
Faculty Sponsor: Huarui Jing

This paper examines the formation and performance of a five-stock portfolio with a focus of climate and weather-driven firms. The increasing possibility of extreme weather events and climate volatility has surfaced new investment opportunities and economic risk among the financial markets. This study analyzes the equity returns on firms whose financial performance is based on weather variability and whether their returns exceed the predictions made by traditional asset pricing models. The analysis dives deeper on companies that perform in disaster mitigation, climate forecasting, environmental monitoring technology, and infrastructure resilience. The research is directed in a macroeconomic environment defined by stable inflation, a growing GDP, and declining interest rates between 2025 and 2026. Utilizing portfolio theory, Capital Asset Pricing Model, and Chen-Roll-Ross Multifactor Model, the analysis formulates a portfolio of diversified firms whose revenues are directly exposed to weather sensitivity. The strategy's goal is to achieve excess returns of about 0.5–1% above market performance over a three-month investment horizon while accepting moderate to high volatility correlated with climate-related risks. The findings are expected to demonstrate that weather variability represents a distinct financial risk factor that can generate short-term abnormal returns and expand traditional asset pricing frameworks.

Poster 96: Beyond Sector Diversification: A Factor-Based Portfolio Approach

William Coley and Tyler Scott
Department of Finance, The University of the South, Sewanee, TN
Faculty Sponsor: Huarui Jing

This paper develops and evaluates a defensive growth-oriented five-stock portfolio constructed using a macro-sensitive diversification framework that integrates the Modern Portfolio Theory with systematic risk analyses across behavioral types, rather than leaning on classical traditional sector labels. Instead of following traditional sector labels, we group firms as cyclical, defensive, or sensitive based on their underlying economic drivers and expected reactions to macroeconomic shocks. In an environment today characterized by fluctuations in economic policy, interest rates, and rising cross-sector correlations, traditional sector diversification is becoming less reliable. Our strategy acknowledges these conditions by emphasizing diversification across the macroeconomic shocks rather than solely on a firm's sector label. The portfolio is constructed via a multi-stage screening process that incorporates firm-specific research and broad economic metrics. Portfolio weights are determined using the Modern Portfolio Theory, while systematic market exposure is obtained via the Capital Asset Pricing Model, or CAPM model. Additionally, the Chen-Roll-Ross framework is utilized to obtain each firm's exposure to macroeconomic variables, ensuring diversification is driven by differences in underlying macroeconomic drivers. The objective of this

strategy is to outperform the S&P 500 while maintaining a beta in our control range and obtaining a superior risk-adjusted return. By combining covariance based optimization with macroeconomic factor analysis, this research provides a structured, replicable framework for constructing a resilient, defensive-growth oriented equity portfolio capable of maintaining diversification benefits during periods of macro-driven volatility.