

# Winthrop McNair Summer Research Symposium 2018

## Richardson Ballroom (A) 1:00 – 5:15 pm



DRAFT Schedule

### TUESDAY JUNE 26, 2018

Oral Presentations 1:05 - 4:05 pm

Poster Presentations 4:05 – 5:15 pm

Estimated Start Time	Scholar	Major	Mentor	Winthrop McNair Summer Research 2018 Project Title
<b>Oral Presentations will be delivered in Richardson Ballroom A starting shortly after the Welcome at 1 pm</b>				
1:05 PM	Frances “Ana” Barkley	Choral Music Ed	Dr. Sherrell Fuller	Invisible Barriers: Experiences of First-Generation, Low-Income Students Navigating Academia
1:20 PM	Destinee Waddy	Exercise Science	Dr. Tyrone Ceaser	The relationship between nature connectedness and physical activity patterns in a sample of collegiate students and staff
1:35 PM	Shemeika McCray	Exercise Science	Dr. Joni Boyd	Understanding the Perceptions of Dry Needling in NCAA Division I Athletes
1:50 PM	Monejah Black	Mass Communication	Dr. Nathaniel Frederick	Shut Up and Dribble: How Twitter Users Attempt to Mute Athlete Opinion
2:05 PM	Chandani Mitchell	Biology	Dr. Kathryn Kohl	Locating Mutagen-sensitivity Gene mus109 in the Drosophila melanogaster Genome Using Deficiency Mapping
2:20 PM	Juliana Quay	Chemistry	Dr. Jason Hurlbert	Expression and Purification of a Novel Calcium-Binding Protein, EfhX, Necessary for Phytopathogenesis in Xanthomonas Strains
2:35 PM	Marlin McKnight	Chemistry	Dr. Jason Hurlbert	Xanthomonas Cynarae FK-506 Binding Protein
2:50 PM	Olivia Greathouse	Math & Spanish	Dr. Kristen Abernathy	A Mathematical Model of Controlling the Spread of Cholera through Disinfection, Vaccination, and Quarantine
3:05 PM	Jessica Stevens	Math & Chemistry	Dr. Zachary Abernathy	A Mathematical Model for Tumor Growth and Treatment Using Virotherapy
3:20 PM	Ta’Niss Robinson	Psychology	Dr. Darren Ritzer	A Look at Mentorship in a Structured Undergraduate Program
3:35 PM	Caity Boudreaux	Psychology	Dr. Darren Ritzer	Prevalence of academic entitlement and potential transferability to job entitlement
3:50 PM	Kalea Young-Gibson	Political Science & Psychology	Dr. Merry Sleight	Entitlement, Empathy, and Dark Triad Predict Political Attitudes and Knowledge

The Poster Session & Reception will be held in Richardson Ballroom 6/26/18 immediately following the Oral Presentations 4:05 – 5:15 pm				
Poster Session & Reception	Sierra Davis	Social Work	Dr. Wendy Sellers	The Impact of Long-Term International Travel on the Socio-Political Consciousness of South Carolina students
	Ali Maclay	Biology	Dr. Courtney Guenther	The impact of generalized anxiety disorder on academic performance in undergraduate students following a brief guided meditation
Richardson Ballroom A 4:05 -5:15 pm	Jasmine Goode	Psychology	Dr. Merry Sleigh	Knowledge, Personality, and Race Predict Perceptions of Gun Control and School Shootings
	Marissa McNeace	Psychology	Dr. Donna Nelson	Predictors of Frequency and Type of Social Support Seeking in Response to Stress
	James White III	Exercise Science	Dr. Joni Boyd	Effects of a Single Bout of Yoga on Self-Esteem, Self-Efficacy, and Happiness of Winthrop Students
	Tim Smith	Social Work	Dr. Adrienne Edwards	Familial and community influences on the sports socialization of Black boys: A case study

**These outstanding undergraduates** are supported by a U.S. Department of Education Ronald E. McNair Postbaccalaureate Achievement TRiO Grant, Winthrop funds, their faculty mentors, Dean Gloria Jones, program alumni, and McNair Program Staff (Dr. Cheryl Fortner-Wood, Director; Barb Yeager, Executive Support Specialist; Ashley Watson, Graduate Associate; Dr. Matthew Hayes, Stats & Methods Coach; Stephanie Bartlett, Head Writing Coach & *Research Bulletin* Editor, and Amanda Cavin, Program Assistant). Special thanks goes to Dr. Jason Hurlbert (Chemistry) for volunteering his time to help the Scholars build strong research writing and presentation skills.

**The Winthrop McNair Scholars Program** prepares first generation, low-income, and underrepresented undergraduates to be successful in PhD programs through a variety of resources and supports including research experience, workshops, graduate admissions and financial aid assistance, test preparation and travel to present research and explore graduate programs. Winthrop's program is funded through 2023 with renewable TRiO grants from the U.S. Department of Education (PR/Award No.: P217A130111 & P217A170094). \$232,265 in annual federal funds to help 30 eligible, outstanding students complete research and prepare for graduate study. This year, federal funds represent approximately 73% of program costs. Winthrop and the Winthrop Foundation will contribute the remaining 27% of the budget with over \$85,000 in cash and in-kind matches.

Winthrop's program is successful because of the excellent work and persistence of our Scholars; expertise of our Mentors; dedication of our staff; support from Dean Jones; funding from the U.S. Department of Education, our institution, and foundation; and guidance from our Advisory Board. The 2017-18 Advisory Board members are: **Dr. Adolphus Belk, Dr. Tyrone Ceaser, Dr. Victoria Frost, Ms. Rose Gray, Dr. Wenonah Haire, Dr. Jason Hurlbert, Dr. Willis Lewis, Ms. Jesslyn Park (Scholar), Dr. Karen Stock, Dr. Will Thacker, Dr. Brad Witzel and Dr. Cheryl Fortner-Wood.** Deans Gloria Jones and Takita Felder Sumter are also members of the Board. For more information about Winthrop's program, visit [www.winthrop.edu/mcnair](http://www.winthrop.edu/mcnair), <http://digitalcommons.winthrop.edu/mcnair/>, or email [fortnerc@winthrop.edu](mailto:fortnerc@winthrop.edu)

## Winthrop McNair Summer 2018 Research Scholars and Projects



Winthrop McNair Scholar: **Frances "Ana" Barkley**

Major: Choral Music Education

Mentor: *Dr. Sherrell Fuller*

Title: Invisible Barriers: Experiences of First-Generation, Low-Income Students Navigating Academia

Abstract: Twenty-four percent of undergraduates in the US are considered first-generation and low-income (Engle & Tinto, 2008), while TRiO student support services serve less than 5% of these students (Mortenson, 2011). Based on their testimonies, are there challenges that first-generation, low-income students experience while navigating higher education? How can these testimonies inform the development of support services for these students? Through semi-structured interviews with first-generation, low-income

students at a Southeastern liberal arts university, this exploratory study seeks to find and reveal challenges and successes. Results and implications will be discussed.



Winthrop McNair Scholar: **Monejah Black**

Major: Mass Communication

Mentor: *Dr. Nathaniel Frederick*

Title: Shut Up and Dribble: How Twitter Users Attempt to Mute Athlete Opinion

Abstract: Professional athletes have engaged in several methods of activism to show their discontent with President Donald Trump, including forgoing the traditional White House visit for teams who win national championships. President Trump has even personally uninvited players and teams, resulting in heated discussions throughout Twitter. This led to a cascade of tweets with disparaging remarks about the president from NBA players like LeBron James and Chris Paul. This research will present a content analysis of Twitter users' replies to NBA players' tweets and examine the

modern methods of silencing athlete opinion. Results and implications will be discussed.



Winthrop McNair Scholar: **Caity Boudreaux**

Major: Psychology

Mentor: *Dr. Darren Ritzer*

Title: Prevalence of academic entitlement and potential transferability to job entitlement

Abstract: The prevalence of entitlement has increased over the past decade. It is important to explore the construct of entitlement in order to understand the associated consequences. The purpose of the current study was to determine the transferability of academic entitlement to job entitlement. However, literature regarding the existence of job entitlement is limited. The current study also examines the link between entitlement and level of grit (or perseverance). This study contributes to current literature by

examining the impact academic entitlement has on individuals' lives and future careers. Results and implications will be discussed.



Winthrop McNair Scholar: **Sierra Davis**

Major: Social Work

Mentor: *Dr. Wendy Sellers*

Title: The Impact of Long-Term International Travel on the Socio-Political Consciousness of South Carolina Students

Abstract: This pilot study will contribute to the student travel/study abroad literature using a new framework to gauge the effect travel has on knowledge of global issues. The United Nations created a list of sustainable development goals meant to rectify pressing issues in the United States and abroad. The goals have been separated into the categories of ending poverty, ensuring prosperity for all, and protection of the planet. Using them as the framework for a quantitative study, data is being collected from college-level students around South Carolina. The project will have at least two

phases. Results and implications will be discussed.





Winthrop McNair Scholar: **Jasmine Goode**

Major: Psychology

Mentor: *Dr. Merry Sleigh*

Title: Knowledge, Personality, and Race Predict Perceptions of Gun Control and School Shootings

Abstract: We assessed how adults' (n=122) personality and knowledge predicted their attitudes about gun laws. Participants responded to scales assessing aggression, empathy, entitlement, and gun law knowledge. Aggression, entitlement, and knowledge predicted support for lenient gun laws and self-defense. Empathy and liberal political ideology predicted support for gun restriction and safety. Caucasians had higher empathy scores, but supported more lenient gun laws, while African Americans had higher

entitlement scores, but supported stricter gun laws. These findings suggest that gun law attitudes are complex, with both race and personality playing influential roles.



Winthrop McNair Scholar: **Olivia Greathouse**

Majors: Math & Spanish

Mentor: *Dr. Kristen Abernathy*

Title: A Mathematical Model of Controlling the Spread of Cholera through Disinfection, Vaccination, and Quarantine

Abstract: Cholera is a water-borne gastrointestinal disease that poses major health concerns and can be fatal. The spread of cholera can be controlled with proper treatment and prevention methods. In this project, we present a mathematical model for the spread of cholera throughout a population, with basic control strategies of disinfection, vaccination, and quarantine. For our proposed model, we calculate the basic reproductive ratio,  $R_0$ , and prove global stability of the disease-free and endemic equilibria based on the value of  $R_0$ . We conclude with numerical simulations

and a discussion of the effectiveness of the control strategies on the spread of cholera.



Winthrop McNair Scholar: **Ali Maclay**

Major: Biology

Mentor: *Dr. Courtney Guenther*

Title: The impact of generalized anxiety disorder on academic performance in undergraduate students following a brief guided meditation

Abstract: Many college students report high levels of anxiety, which can negatively impact their academic performance. Meditation is currently being explored as a method to reduce anxiety, with duration and frequency under investigation to optimize outcomes. Therefore, this pilot study examined whether the severity of generalized anxiety disorder affected the influence of a brief, one-time, guided meditation on undergraduate academic performance.

Students completed the GAD-7 to assess levels of anxiety, participated in a brief meditation, completed a lab quiz, and evaluated their meditation experience through a post-survey. There was no significant difference in quiz scores based on anxiety level.



Winthrop McNair Scholar: **Shemeika McCray**

Major: Exercise Science

Mentor: *Dr. Joni Boyd*

Title: Understanding the Perceptions of Dry Needling in NCAA Division I Athletes

Abstract: The aim of this study was to examine the perceptions of dry needling within NCAA Division I athletes. The study allowed a total of 77 athletes to state their perceptions of dry needling through a 15-item survey. The results indicated that 66% of them did not have experience with dry needling while only 34% did experience dry needling. For the ones who did experience dry needling, they reported that dry needling was effective and comfortable for recovery and that they would

recommend it to others. This study can add to previous studies in the past to help understand dry needling.





Winthrop McNair Scholar: **Marlin McKnight**

Major: Chemistry

Mentor: *Dr. Jason Hurlbert*

Title: Xanthomonas Cynarae FK-506 Binding Protein

Abstract: Xanthomonas cynarae is a phytopathogenic bacterium that injects an array of effector proteins into plant cells during infection. We have recently identified a protein that may aid in the proper refolding of these effector proteins. This protein has shown sequence identical to PPIases and Chaperonins. We have cloned the gene, Xop AZ from X.cynarae into a prokaryotic expression plasmid and purified recombinant Xop AZ from bacteria culture. We have purified our protein using metal chelating affinity chromatography by taking advantage of Xop AZ's affinity to  $Co^{2+}$ . Future work involves using crystallography to

determine the structure of Xop AZ.



Winthrop McNair Scholar: **Marissa McNeace**

Major: Psychology

Mentor: *Dr. Donna Nelson*

Title: Predictors of Frequency and Type of Social Support Seeking in Response to Stress

Abstract: This research focuses on associations between individual difference variables and social support seeking behaviors. We examined whether the Big Five Personality traits, social network size, age and gender predict frequency and type of support seeking. Data was collected through social media and university classes. Overall, respondents reported more frequent face-to-face support seeking across different stressors. Age was positively linked to social network size, and negatively associated with frequency of help seeking. Online support seeking was negatively

associated with both conscientiousness and happiness. Our findings contribute to the limited literature available on this topic.



Winthrop McNair Scholar: **Chandani Mitchell**

Major: Biology

Mentor: *Dr. Kathryn Kohl*

Title: Locating Mutagen-sensitivity Gene mus109 in the *Drosophila melanogaster* Genome Using Deficiency Mapping

Abstract: Defects in the DNA repair process can be detrimental. For example, mutations in the *Drosophila melanogaster* DNA repair gene mus109 cause impairment resulting in larval death. However, little is known about mus109, including its genomic location. This study aims to locate mus109 using deficiency mapping. The mus109D2 allele was crossed to four deficiencies covering the 8F10-9B1 region of the genome. Brood 1 and Brood 2 were treated

with H<sub>2</sub>O and 0.05% MMS, respectively. Offspring were scored based upon the sex and eye shape phenotype, and this data was used in complementation analysis to narrow the probable genomic location of mus109.



Winthrop McNair Scholar: **Juliana Quay**

Major: Chemistry

Mentor: *Dr. Jason Hurlbert*

Title: Expression and Purification of a Novel Calcium-Binding Protein, EfhX, Necessary for Phytopathogenesis in *Xanthomonas* Strains

Abstract: Ca<sup>2+</sup> is a ubiquitous signaling molecule. We have recently identified a gene from virulent strains of *Xanthomonas* that is vital to pathogenicity. Bioinformatic analyses revealed three predicted domains on this protein: an amino terminus of unknown function, a transmembrane  $\alpha$ -helix, and a carboxy-terminal domain containing two EF-hand Ca<sup>2+</sup>-binding domains. Here, we describe the expression and purification of this novel protein, EfhX. Results and implications will be discussed.





Winthrop McNair Scholar: **Ta'Niss Robinson**

Major: Psychology

*Mentor: Dr. Darren Ritzer*

Title: A Look at Mentorship in a Structured Undergraduate Program

Abstract: From the great deal of research previously done in the area of mentorship, we know that it can be very valuable to individuals. In this study, we examine aspects of mentorship in a structured undergraduate program from the perspectives of both the protégés and the mentors. Current and past protégé McNair Scholars and current and past mentors of the program participated in an approximately ninety to ninety-five question survey assessing mentoring functions, satisfaction, and mentorship recommendations.

We anticipate that these findings will provide a better understanding of key favorable qualities of mentorship.



Winthrop McNair Scholar: **Tim Smith**

Major: Social Work

*Mentor: Dr. Adrienne Edwards*

Title: Familial and community influences on the sports socialization of Black boys: A case study

Abstract: Literature shows that interpersonal relationships can influence physical activity by providing social support and establishing social norms that constrain or enable health-promoting behaviors. The purpose of this study is twofold; (1) to examine the nuances of how parents and community agents integrate racial socialization and gendered socialization during interactions with young Black boys, and (2) how that socialization influences young Black boys' perceptions of the importance of playing sports. To

investigate this, Black boys, their parents, and community agents were interviewed to see what external influences in a Black boy's life played a role in his sport socialization.



Winthrop McNair Scholar: **Jessica Stevens**

Majors: Math & Chemistry

Mentor: *Dr. Zach Abernathy*

Title: A Mathematical Model for Tumor Growth and Treatment Using Virotherapy

Abstract: We present a system of four nonlinear differential equations to model the use of virotherapy as a treatment for cancer. This model describes interactions among infected tumor cells, uninfected tumor cells, effector T-cells, and virions. Using various stability analysis techniques, we establish a necessary and sufficient treatment condition to ensure a globally stable cure state. We additionally show the existence of a cancer persistence state when this condition is violated and provide numerical evidence of a Hopf

bifurcation under estimated parameter values from the literature. We conclude with a discussion on the biological implications of our results.



Winthrop McNair Scholar: **Destinee Waddy**

Major: Exercise Science

Mentor: *Dr. Tyrone Ceaser*

Title: The relationship between nature connectedness and physical activity patterns in a sample of collegiate students and staff

Abstract: Researchers hypothesize that a strong relationship exists between physical activity (PA) and nature connectedness (NC); the most physically active individuals are also the most nature connected. Designing PA programs and modifying college campuses through the lens of biophilia can provide a more logical, evidence-based approach to improve overall health and wellness. The purpose of this study is to identify the relationship between PA and NC in a sample of collegiate faculty and students.

Participants completed two surveys: The International Physical Activity Questionnaire, and the Connectedness to Nature Survey. Results and implications will be discussed.



Winthrop McNair Scholar: **James White III**

Major: Exercise Science

Mentor: *Dr. Joni Boyd*

Title: Effects of a Single Bout of Yoga on Self-Esteem, Self-Efficacy, and Happiness of Winthrop Students

Abstract: The purpose of this study was to determine if a single bout of yoga affects the happiness, self-esteem, and self-efficacy for exercise of undergraduates. Previous research explored long-term effects of yoga on mental health, but not at a single bout of yoga on the three. 27 students participated from a southeastern, comprehensive university. Researchers recruited volunteers via email, social media, and PESH classes. Volunteers answered questions on demographics, happiness, self-esteem, and self-efficacy for exercise before

participating in a 30-minute yoga session that was followed by a post-questionnaire. Results and implications will be discussed.



Winthrop McNair Scholar: **Kalea Young-Gibson**

Majors: Political Science & Psychology

Mentor: *Dr. Merry Sleigh*

Title: Entitlement, Empathy, and Dark Triad Predict Political Attitudes and Knowledge

Abstract: Adults (n = 126) responded to scales to assess Dark Triad (e.g., narcissism, Machiavellinism, and psychopathy), empathy, academic entitlement, knowledge, and political beliefs. Adults with a tendency for dark personality traits valued free speech and devalued religious liberty. Adults high in empathy agreed more with a democratic platform and valued the right of petition. Academic entitlement predicted inflexibility, voting by gut instinct, lower political knowledge, and increased government responsibility for college debt.

These findings suggest that personality variables impact political beliefs, with entitlement as more predictive than empathy, knowledge or Dark Triad.