

MCNAIR SCHOLARS PROGRAM



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ABOUT THE RONALD E. MCNAIR SCHOLARS PROGRAM

The McNair Scholars Program is named after the late Dr. Ronald E. McNair, an African American physicist and NASA astronaut who perished in the explosion of the Challenger space shuttle in 1986.

Federally sponsored by the U.S. Department of Education, the program prepares participants for graduate programs through involvement in research and other scholarly activities.

The participants demonstrate strong academic potential, especially in the STEM disciplines. They are first generation college students from economically disadvantaged backgrounds, or hail from underrepresented groups in higher education.

TRIO

RONALD E. MCNAIR
POST-BACCALAUREATE
ACHIEVEMENT PROGRAM

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A MESSAGE FROM THE DIRECTOR

DR. ÁNGEL REYES-RODRÍGUEZ

Welcome back to campus. We are delighted to be providing support to our students in person at the McNair suite. Fall 2021 will be an excellent opportunity to uplift each other, support one another, and care for every member of our campus community. McNair Scholars Program does all that for our students and more.

McNair prepares undergraduate students for applying and being accepted into graduate school. Students pursue Ph.D. degrees in their field to access careers in research. But there are so many more reasons to get a Ph.D. For instance, with a doctorate, you can develop new technical materials, work on specialized engineering projects, contribute to the pharmaceutical industry, or become the ultimate authority in your field.

Ph.D. graduates tend to have higher job security and pay than those without a Ph.D. That was especially evident during economic recessions and the COVID-19 lockdowns. Speaking of COVID, who was a leading force behind the development of the COVID vaccines? Dr. Kizzmekia Corbett, An African American female scientist... with a Ph.D. degree. She was instrumental in conducting a lot of the research behind the Moderna coronavirus vaccine. Researchers with doctorates drive the teams working on vaccine development.

If you are interested in pursuing graduate school, we can help. We offer paid research experience during the summer, including additional stipends to cover room and board, plus four credits of independent research. We connect you with mentors. We offer tutoring, career development, and guidance through the graduate school application process. We discuss ways to go to graduate school free of cost and often get paid for studying too! And finally, we take students to cultural activities and conferences, give book scholarships, and create networking opportunities. Our priority is ensuring you get access to the resources that can help you succeed.

Are you interested, or know someone who might be? We can answer your questions and tell you whether you qualify. Our Early application deadline is October 12. These applications will have guaranteed priority consideration, an additional book stipend, and additional travel opportunities. The regular Application Deadline is December 3, 2021. We look forward to connecting with you.

Best Regards,

Ángel L. Reyes-Rodríguez, Ph.D.

Director

McNair Scholars Program

WELCOME NEW & RETURNING SCHOLARS!

New Scholars:



Sebrine Abu-Hamdeh
Civil Engineering



Steven Fairley
Electrical
Engineering



Angela Harris
Black Studies



Dywayne Johnson
Psychology & Philosophy



Forrest Osborn
Mechanical Engineering



Silvia Surunis
Psychology

Returning Scholars:

Kylie Armstead
Onetha Belgrave
Ericka Clifton
Janell Craig
Thyra Chaney

Jessica Disla
Donna Erwin
Maria Hanean
Michail Haswani
Erica Hughes

Marissa McIntosh
Alexis Merk
Hannah Tackett
Sadie-Marie Wright
Orlando Lopez

MCNAIR SUMMER RESEARCH INSTITUTE (SRI) STUDENT ABSTRACTS

Phonological Interventions for Children with Speech Sound Disorders

Kylie Armstead and April Yorke, Ph.D.

Department of Speech and Hearing, Cleveland State University

Speech sound disorders refer to the different types of difficulties which affect the intelligibility of a child's speech. There are five types of speech sound disorders which include: phonological disorder, inconsistent speech disorder, articulation disorder, childhood apraxia of speech, and childhood dysarthria. Phonological treatments which focus intervention on hearing the distinction between speech sounds and creating phonological representations for speech sounds have been proven effective for children speech sound disorders. The purpose of the current paper is to summarize evidence-based interventions that are beneficial to children with speech sound disorders. The results provide a wide range of effective interventions to meet the needs of children with speech sound disorders.

Streaming Video Content in the Time of COVID-19

Thyra Chaney

Department of Film and Media Arts, Cleveland State University

When the COVID-19 pandemic led to quarantine, isolation, and distancing protocols in the U.S., audiences turned to Subscription Video On Demand (SVOD) platforms to cope. While the use of SVOD platforms increased during the pandemic, the pandemic also challenged the entertainment industry's ability to satisfy increased demand for content. A mixed methods approach was used to investigate the motivations that led to widespread use of SVOD platforms by U.S. audiences during the pandemic and the methods used by media companies to adapt to audience demand for streamable content during the same period. A literature review was used to understand the development of the SVOD industry, its role within the entertainment industry as a whole, and its influence in everyday life prior to the COVID-19 outbreak. A secondary literature review was conducted on media uses and audience motivations. A timeline analysis was used to compare the developments of the COVID-19 pandemic to the effects on production and distribution strategies in the entertainment industry. Pre-existing SVOD companies were uniquely advantaged at the start of the pandemic period when theatrical release and broadcast television production schedules were disrupted by pandemic related shutdowns. Overall, the effects of the pandemic catalyzed the entertainment industry's transition from traditional release formats to digital based subscription and streaming models. The widespread use of SVOD platforms during the pandemic is indicative of the value of media in modern life as well as the value of new technologies and distribution models.

Fabrication of Nylon-6/Multi-Walled Carbon Nanotube Composite For Sodium Ion Quantification

Lopez, Orlando, N. Monty, Chelsea

Department of Chemical and Biomedical Engineering, Cleveland State University

Multi-walled carbon nanotubes (MWCNT) are a material being integrated in a wide variety of fields due to their high tensile strength and high electrical and thermal conductivity. Implementing MWCNT into an electrochemical sensing platform has allowed for improved electrical performance by increasing sensor sensitivity. Through this work, fabrication of a nanocomposite used in a sensor that is able to measure the sodium ion concentrations found in sweat in real-time was studied to analyze the effects of incorporating MWCNT in the solution used in the production of the sensor. 0.5, 1, 2, and 5 weight percentages of MWCNT were incorporated into the solution. The solutions were then electrospun into a mat and cut into 1.2 cm by 1.2 cm sensor samples. The samples were then analyzed electrochemically using a potentiostat, to run direct current through two micro-alligator clips placed on the edges of the nanocomposite to ultimately measure the resistance at known concentrations of sodium solutions. The average resistance was then plotted against the sodium solutions to then observe the coefficient, exponent, and R^2 value of the best fit line to determine the performance of the sensors. Electrochemical analysis indicates that the higher the percentage of MWCNT, the better the sensor performed. The performance of these sensors compared to the current fabrication method show that the current fabrication method manufactures more accurate sensors. Future work that includes higher weight percentages as well as more replicates will determine if incorporating MWCNT into solution is a viable option to reduce the fabrication time.

High-Speed Video Acquisition and Analysis of Taekwondo Kicks

Alexis Merk and Andrew Resnick, Ph.D.

Department of Physics, Cleveland State University

Taekwondo is a form of martial arts that is characterized by techniques such as: kicks, spins, and strikes. We hypothesize that through these movements, angular momentum acts as an essential characteristic of the motions used in Taekwondo. In order to study the movements, we constructed a large "Lazy Susan", that a martial artist stands on and performs several kicking motions. High-speed videos of the performance are collected and the footage is analyzed. The analysis results in calculations determining rotation rate(s) and the integration of angular momentum in Taekwondo. A further understanding of angular momentum in a Taekwondo system would allow us to better comprehend how energy and forces are associated in martial arts, as well as, create improved kinematic models of Taekwondo forms.

SRI ABSTRACTS

C O N T I N U E D

Development of Childhood Friendships in Children Ages Four to Five
Tackett, Hannah; Naser, Shereen
Department of Psychology, Cleveland State University

Work with older elementary students reveals that children often identify friendship qualities based on what they see from their parent's relationships, but close friendships amongst peers are developed in children in preadolescence years (ages eight to ten years old). However, little is known about friendship building in four to five year olds. Therefore, the purpose of this study is to describe how children ages four to five define and think about the process of making friendships. Researchers conducted interviews with twenty-two children ages four to five years old from a suburban child care center. Survey questions asked students how they think about friendship and their process of finding and making friends. Systematic content analysis of interview transcripts indicate that friendship development for children ages four to five is most times related to convenience and self initiated conversation amongst peers. Moreover, the children in this study reported engaging in play with peers they have already established a relationship with before engaging in social play with unfamiliar peers around them. Results of this study can inform how adults support friendship building at such a young age.

Prevention of Mild Cognitive Decline in Aging Senior Citizens
McIntosh, Marissa and Myrita Wilhite
Department of Communications, Cleveland State University

Mild cognitive impairment (MCI) is a condition that is very common among the elderly and is characterized by difficulty remembering, deterioration with attention skills, and sometimes making decisions. MCI will not initially interfere with activities of daily living, but it is considered to be a first step towards evolving dementia. This study sought to explore the perceptions of older adults' experiences as they participated in a community book club, specifically, exploring how these participants perceive their cognitive memory skills before and after participating in the book club. A survey was developed to collect the data and interpret the results. Five responses were anonymously collected and participation in the survey was completely optional. The results of the survey show that 50% of respondents perceived that their ability to remember and concentrate has improved after participating in the book club. The other 50% of the respondents reported having no difficulty remembering or concentrating, therefore reporting no improvement from before and after participating in the book club. The results of this study suggest that participation in a community book club may contribute to improved cognitive abilities, such as remembering and concentrating.

SRI ABSTRACTS

C O N T I N U E D

Direct File of Youthful Offenders in Florida
Onetha Belgrave, and Christopher Mallet
Social Work, Cleveland State University

In the State of Florida, children are sent through the court system by the appointed state prosecutor to adult jails, “forced” to take plea bargains, and enter into a diversion program or prison. Upon exiting this system, they face barriers finding employment or housing. The label “convicted felon” follows them for the rest of their lives. The lack of resources and opportunities might be the reason behind the high recidivism rate. In this project, we explore the issues regarding youth offenders direct file, how it affects families especially those who are “at-risk”, why blacks are arrested and incarcerated more than any other race, and ways to reform the juvenile justice system. For this purpose, we interviewed community members with direct experience in how the criminal system in Florida interacts with the youth, the support aimed at youth prevention of offending, and the initiatives taken by non-government entities. These interviews illustrated how the State of Florida does not have effective strategies to support at-risk youth and prevent them from entering the criminal justice system. Private citizens and non-profit organizations are filling the void by creating prevention programs. Together, these findings suggest there is a need for juvenile justice reform and greater investment in prevention strategies.

How Can We Reduce Consumer Resistance to Sustainability Interventions in Retail Stores?
Moderating Roles of Culture, Personality, Customer Loyalty, and Marketing Efforts.
Janell Craig, Jieun Park
Ahuja Collage of Business, Cleveland State University

Consumer resistance in the retail industry has had a major impact on the success rate of sustainability interventions. Consumer resistance can be described as consumers opposition or unwillingness to change due to a shift in the product or service (Gonzalez-Arcos & Joubert, 2021). Limited research on consumer resistance to sustainability interventions creates a research gap that we are attempting to fill. We propose that marketers can reduce consumer resistance to sustainability interventions in the retail industry by implementing the following moderators which suggest that the relationship between consumer resistance and sustainability will differ based upon the type of store, marketing efforts, personality traits, cultural identity, and customer loyalty. A structural equation model will be estimated in “analysis of a moment structure” to assess the proposed model. The analysis will provide evidence or no evidence for the hypothesized relationships among all the variables of interest. With this research, our goal or main purpose is to understand how to reduce the negative effects or outcomes from consumer resistance when implementing a sustainable intervention in the retail grocery industry.

SRI ABSTRACTS

C O N T I N U E D

MBTI and personality's Academic Preferences

Jessica M Disla and Elizabeth Goncy

Department of Psychology, Cleveland State University

The Myers Brigg typology inventory (MBTI) has been a popular tool used for identifying individuals' preferences, general decision making, and career trajectories selection. Scholars have suggested knowing one's own preference, values and abilities are crucial for college major and career path selection. Several articles have analyzed the relationship between distinct MBTI's personalities and their choice for academic and career paths. This systematic literature review shows patterns of the relationship of distinct orientations and personality types across trajectories. Results suggest that Extroverts (E) were linked to business, education, and music careers, whereas Introverts (I) were prevalent among technology and computing. Intuitive (N) were found in the faculty of arts, music, architecture, and some computer and technology trajectories, whereas most Sensors (S) were found in business, education, science, computing, and civil engineering. Feelers (F) were found in music therapy and Thinkers (T) and Judgers (J) were linked to business, education, computing, engineering, and science. Perceivers (P) were found in the fine arts and in some engineering programs. In relation to a significant pattern between personality type and trajectory, types such as ESTJ, ENTJ, ISTJ, ESFJ, and ESTP were linked to business; ISTJ and INTJ to technology, computers programs, and engineering programs. These previous studies provide insight on using the MBTI as a tool of guidance for undecided students to choose an academic major and professionals to use the type of work that best matches their preference and abilities.

Solar Thermal Dish Storage System Project: A Novel Receiver Experiment Model

Osborn, Forrest; Hunke, Chris, Ph.D.; and Tao, Yongxin, Ph.D.

Mechanical Engineering, Cleveland State University

Solar energy utilizes sunlight to generate electricity but inefficiencies in energy storage limits this technology. Transferring sunlight into thermal energy can contribute to solve this problem. The goal of this study was to determine feasibility of a heat exchanger to be used with an existing solar parabolic dish. For this purpose, a heat gun was used to measure the thermal properties of a novel receiver design. This system was used to analyze different receiver configurations for a copper tube containing water as a heat transfer fluid. The inlet and outlet water temperatures and the effect of HTF flow rate were measured. A heat exchanger was constructed using HVAC parts, copper tubing, aluminum foil, and a ceramic pot. The results of an initial test demonstrate the ability of the system to heat water a few degrees. However, better setup or additional modifications to the heat exchanger would be necessary.

SRI ABSTRACTS

C O N T I N U E D

The Role of BATF2 in Experimental Autoimmune Encephalomyelitis and Multiple Sclerosis ***Habean, Maria; Tinkey, Rachel; Williams, Jessica***

Department of Neuroscience, Lerner Research Institute, Cleveland Clinic, Cleveland, Ohio

Astrocytes play an active role in lesion formation in multiple sclerosis (MS) and the murine model, experimental autoimmune encephalomyelitis (EAE). In EAE and MS, activated astrocytes release cytokines and chemokines that lead to an upregulation in BATF2 expression, a transcription factor previously shown to be upregulated during acute MS and EAE. BATF2 regulates infiltrating immune cells in the central nervous system; therefore, the increased expression of BATF2 by astrocytes may lead to more severe lesions and exacerbated clinical outcomes. Immunohistochemistry was used to characterize lesion size, total BATF2 expression, and the types of infiltrating cells found in the lesion. BATF2 expression was upregulated during acute EAE compared to chronic EAE. The highest proportion of cells expressing BATF2 during acute and chronic EAE was astrocytes, with myeloid lineage cells being the second largest in acute and the fewest cells expressing BATF2 were T cells and B cells in both acute and chronic. These data suggest that BATF2 expression plays a role in astrocyte response to lesion formation in EAE and that BATF2 may represent a viable therapeutic target in MS.

The Impact Emotions Have on Recall

Sadie-Marie Wright, Maria Rowlett

Department of Psychology, Cleveland State University

The relationship of how emotions impact the way a person remembers events has helped improve fields outside of psychology, such as criminal justice and biology. Most studies that explore emotions and recall have had inconclusive results due to factors such as participants being tasked with free recall in response to stimuli such as the study done by Gorlin et al. (2018). With that knowledge, the current study focused on a task of recall from a short list of words along with a direct stimulus in the form of an emotional or non-emotional passage with hopes that it would affect the short-term memory enough to result in lesser recollection amongst the group of participants who received the emotional stimuli passage. Sixty-four participants were recruited through email and social media, they received either the non-emotional passage or the emotional passage. An independent t-test was conducted to test whether participants that read the emotional passage recalled fewer words than those who read the non-emotional passage. The results, however, were found to be not significant. A limitation to this study was the sample size, and a larger number of participants is needed. Due to the study being conducted online over the summer months, finding an adequate number of participants proved to be very challenging. Future research should host a larger sample size to have a better chance for a significant finding.

Do Adverse Childhood Experiences Affect Rates of Depression?

Donna R. Erwin and Elizabeth Goncy, Ph.D.

Department of Psychology, Cleveland State University

Adverse childhood experiences (ACEs) classified as traumatic events that occur during the first eighteen years of life and range emotional neglect to sexual abuse. A bulk of literature addresses that gender differences can attribute to higher rates of depression/anxiety in adolescent females. However, the current literature lacks information about how identifying as a minority affects exposure to ACEs and how it contributes to rates of depression/anxiety in comparison to White participants. The present study investigated whether experiencing ACEs during adolescence affect rates of depression/anxiety, and whether gender differences increase the chances of depression/anxiety as well as examine whether race can be a moderator between ACEs and depression/anxiety. It is hypothesized that experiencing ACEs heightens one's chance of developing depression/anxiety as opposed to experiencing none. We also hypothesize that identifying as a minority will increase an individual's chances of developing depression/anxiety during adolescence. To investigate this, secondary data was analyzed based on responses to an online survey given to United States adolescents aged 14-18 (N=103), which assessed ACE exposure and symptoms of anxiety/depression. Analysis indicated that the mean score for anxiety was higher for those who experienced ACEs ($M = 28.60$, $SD = 7.47$) in comparison to those who did not ($M = 25.33$, $SD = 7.16$). Similarly, the mean score for depression was higher for those who experienced ACEs ($M = 10.53$, $SD = 3.56$) than those who did not experience ACEs ($M = 8.40$, $SD = 2.45$). Additionally, 70% of or non-white sample experienced ACEs, while the other 30% did not. As for the white sample 58% experienced ACEs, while the remaining 42% did not. within this sample there were no differences between white & ethnic minority youth who experienced ACEs and who had not experienced ACEs. The implications for the research are to see if the rates of depression/anxiety can be reduced in adolescents.

SUMMER CULTURAL EVENTS

We watched:
**Panther Women:
An Army for the
Liberation** at
Cleveland Public
Theater



Explored local
culture by
watching **The
Heights** in
our very own
Cleveland
Heights

Learned about
Ethiopian culture,
and tried some
Ethiopian dishes
at a local fave,
Empress Taytu



MCNAIR SCHOLARS PROGRAM

IN COLLABORATION WITH THE OFFICE OF MULTICULTURAL ENGAGEMENT, PRESENT:

GUEST SPEAKER

*Carlos Crespo, Ph.D.
Professor of Chemistry
Case Western Reserve University*

Sept. 21 | 11:30 am | SR 152



Part of the celebrations of the Hispanic Heritage Month

Refreshments will be provided

OPEN HOUSE

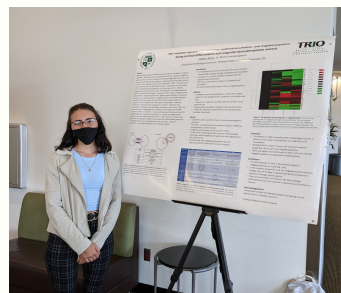
Oct. 7 | 11am - 2pm | SR 155

Learn more about our program

Visit our facilities

Meet our Staff and Scholars

Lunch and refreshments will be provided



APPLY TO THE MCNAIR SCHOLARS PROGRAM:

Early Application Deadline: Oct. 12, 2021

Priority consideration | Additional book stipend & travel

Application Deadline: Dec. 3, 2021



CALENDAR OF EVENTS

09/07 | 11:30 AM

Present Your Poster Successfully | Hala Osman

09/21 | 11:30 AM

Chemistry Talk | Carlos Crespo, PhD | SR152

10/05 | 11:30 AM

Write an Effective Statement of Purpose | Mary McDonald, PhD

10/07 | 12:30 PM

Open House | McNair office suite

10/13 | 5:30 PM

Cultural Event: Dinner & The Lion King | Playhouse Square

11/02 | 11:30 AM

Learn About Personal Finances| TBD

11/18 | 5:00 PM

Cultural Event: Immersive Van Gogh | Location TBA

12/08 | 5:30 PM

Cultural Event: Dinner & Wicked | Playhouse Square