

TRIO RONALD E. MCNAIR PROGRAM RESEARCH SYMPOSIUM 2023



THURSDAY, APRIL 13TH

8am - 4pm

University of North Dakota,
Memorial Union Small Ballroom



KAITLIN HAZEL
***MINDFULNESS IN THE CLASSROOM: ASSESSING
THE IMPACT OF A BRIEF INTERVENTION ON
AWARENESS, CONCENTRATION, STRESS, AND
ACADEMIC RESILIENCE.***

Mentor: Dr. Alison Kelly

Kaitlin Hazel is a senior majoring in psychology at the University of North Dakota. After she graduates in the fall, she plans to pursue a PhD in clinical or counseling psychology. She has been involved in two research studies on mindfulness and one project on benevolent sexism. Kaitlin is also involved on campus. She is Vice President of the UND First-Generation Club and treasurer of the Student Psychological Association.

Abstract

The purpose of the present study was to add to the body of literature examining the potential impacts of classroom mindfulness interventions on students' academic performance. We aimed to examine if the intervention would affect Introductory Psychology students' (N = 91) metamemory and concentration, academic resilience, course performance, mindfulness, and perceived stress. During the six-week intervention, each class period began with a brief mindfulness practice. Immediately after the exercise, students were asked to write a summary to encourage attentiveness and participation. We found that the intervention improved students' mindfulness and metamemory and concentration. We also found that more frequent practice was associated with reduced perceived stress and better course grades. Overall, the findings show that a brief classroom can be used to support students' concentration well-being.

SCHOLARS



MYRA HENDERSON
***UNDERSTANDING MEMOIR AS PRESERVATION,
HISTORICAL NONFICTION AS CONTEXT, AND
ANALYZING RHETORIC: A MEANS FOR LITERARY
ADVOCACY***

Mentor: Dr. Sharon Carson

Myra Henderson is a graduating senior at the University of North Dakota (UND) pursuing bachelor's degrees in English and Communication, as well as certificates in Writing & Editing and French. Myra's research is sponsored through her membership as a Ronald E. McNair Scholar and focuses on working with contemporary (1945-present), Black U.S.-American memoir; historical nonfiction; and rhetoric. In addition to being a McNair Scholar, Myra also works at the UND Writing Center, serves as Managing Editor of UND's campus literary magazine Floodwall, and is a member of the leadership cabinet for UND's Black Studies Project.

Abstract

This research project lies within English and Black Studies and aims to explore the idea of literary preservation through historical nonfiction and Black American memoir. As a genre, nonfiction offers the ability to assess and analyze the use of language as a vital factor in shaping the understanding of historical contexts across time. As it relates to memoir, there is a particular focus on assessing the use of authors language as a way to describe and preserve their lived experience in a particular time and place. Ultimately it is the researcher's goal to explore how authors use of contemporary language in historical nonfiction may allow for a reshaping and/or new approach for understanding influences on personal narrative in the form of memoir, which will benefit both the researcher and readers alike.



SAMANTHA IVERSON
GESTALT LANGUAGE LEARNERS AND
AUGMENTATIVE
ALTERNATIVE COMMUNICATION

Mentor: Dr. Sarah Robinson

Samantha Iverson studies Communication Sciences and Disorders, "Experience outside of school led to my interest in this field and will continue to be a motivating influence throughout my career. I am fascinated with various speech and language disorders and integrating therapy into families' lives to help them communicate with the world around them." She is interested in researching language acquisition methods with minimal to non-speaking Gestalt language learners on the autism spectrum.

Abstract

Gestalt Language Learners (GLL) is a theoretical approach to language learning that focuses on how learners perceive and organize language. According to this approach, language is perceived as a whole, rather than as a collection of individual words and phrases. GLL emphasizes the importance of context and the way in which language is used in communication. By understanding the way in which language is perceived and organized, educators can design language learning activities that are more effective and engaging for learners.

Augmentative and Alternative Communication (AAC) refers to a range of techniques and tools that are used to support individuals with communication difficulties. This can include individuals with developmental disabilities, language impairments, or other communication disorders. AAC can involve the use of electronic devices, such as computers or tablets, as well as non-electronic tools such as picture books or communication boards. The goal of AAC is to provide individuals with a means of communication that is appropriate for their needs and abilities, and to help them to participate more fully in social interactions and activities.



SYDNEY MENNE
BUILDING A MUON DETECTOR: HOW THESE INVISIBLE PARTICLES ARE DETECTED

Mentor: Dr. Tim Young

Sydney Menne is a senior double majoring in mathematics and physics with a focus on astrophysics. Sydney has conducted research through the McNair Program in astrophysics, specifically focusing on supernovae and progenitor star distributions. Among her many other honors and awards, Sydney is North Dakota's first-ever Marshall Scholar and will be travelling to the UK to begin graduate school in the Fall.

Abstract

Muons are elementary particles produced when cosmic rays (high energy particles, most often protons), strike a nucleus in the Earth's upper atmosphere and produce a shower of particles including muons, neutrons, pions, and neutrinos, among others. Muons decay after a lifetime of about $2.2 \mu\text{s}$. Even though they travel very close to the speed of light ($\sim 0.99c$), it still takes much longer than this $2.2 \mu\text{s}$ lifetime for a muon to reach the surface of the earth from where they are produced in the upper atmosphere ($\sim 15\text{km}$). Because of this, we would expect all muons produced in the upper atmosphere to decay by the time they reach the Earth's surface. However, due to the time dilation effect of Einstein's Theory of Special Relativity, some muons do reach the Earth's surface, where we can detect them.

Sydney is constructing two muon detectors which she will use to gather muon count rates at different altitudes. With the help of the UND Aerospace department, she plans to take the detectors in an aircraft up to 30,000 ft to gather data. She will also gather data from both the basement and top floor of UND's Witmer hall. Muon count rates have been published for an underground mine in Soudan, MN, which she can further compare my count rates to. All of this data acquisition, comparison, and analysis will be testing Einstein's Theory of Special Relativity in support of the time dilation and length contraction effects of special relativity.



MOHAMED MOHAMED
3D PRINTED MAGNETIC MICRO-ROLLERS FOR
BIOLOGICAL APPLICATIONS

Mentor: Dr. Jamal Ali (Florida Agricultural & Mechanical University)

Mohamed Mohamed is pursuing a double major in Chemical Engineering and Chemistry. He intends to obtain a PhD in Chemical Engineering. Mohamed is the oldest of three siblings who as a family immigrated to the U.S. from Somalia.

Abstract

Advances in microfabrication have led to increasing interest in soft small-scale actuators for biomedical applications. This is in large part due to their small size and their ability to perform various biomedical operations, such as accurately targeted therapy, minimally invasive surgery, and precise cell or drug delivery. Many of these microrobots have been proposed with the intention of developing efficient motion control in fluidized environments. However, currently traditionally used microfabrication techniques, initial developed for semiconductor fabrication, are not as suitable for producing biocompatible soft microrobots that carry cells and perform tasks.



NICOLLE PETERSON ***THE BENEFITS OF VISUAL LEARNING***

Mentor: Malissa Kuznicki, MFA

Nicolle Peterson is a senior majoring in Visual Arts. Nicolle comes to the arts after a stint as a physics major, so she is inspired to examine how we can approach teaching and explaining difficult concepts visually using principles of design. Nicolle is currently completing an internship at the North Dakota Museum of Art on UND's campus and is enjoying learning about what happens behind the scenes at an art museum, funding, framing, displaying & preserving art, and the varied lives of artists in the region and beyond.

Abstract

Visual learning is a learning style that emphasizes the use of visual aids to facilitate the learning process. This can include things like images, diagrams, videos, and animations, among others. There are many benefits associated with visual learning, including improved retention of information, increased engagement, and enhanced understanding.

One of the main advantages of visual learning is that it can help learners retain information more effectively. Studies have shown that people are more likely to remember information that is presented in a visual format than information that is presented in a purely textual format. This is because visual aids can help people make connections between different pieces of information, which can enhance their ability to remember and recall that information later on.

Visual learning can also increase engagement among learners. By using a variety of visual aids, educators can help to create a more dynamic and interactive learning experience. This can help learners stay engaged and motivated, which can lead to better learning outcomes.

Finally, visual learning can enhance understanding by making complex concepts more accessible. Visual aids can help learners to better understand abstract or complex ideas by breaking them down into more manageable components. This can make it easier for learners to grasp difficult concepts and apply them in real-world situations.



SAVANNAH POMANI **PEER LED INTERVENTIONS FOR INDIGENOUS** **COLLEGE STUDENTS**

Mentor: Dr. RaeAnn Anderson

Han, Mitakuyapi, Anpetu de Cante waste nape ciyuzapi. Savannah emakiyapi. Minneapolis ed wati, Toka Nuwan hematahan, Pomani Tiospaye kin hematahan, Mihunkake hena Tonia Ka Gabriel Black Elk ewicakiyapi. Sisseton Wahpeton Oyate Oyanke ed Omawapi. Damakota. Waniyetu Wikcemna numpa sum zaptan. Hehana apekta.

Hello, my relatives, Today I great you with a healthy hearted handshake. My name is Savannah Pomani and I live in Minneapolis, MN. I come from Enemy Swim District and my parents are Tonia and Gabriel Black Elk. I am enrolled at the Sisseton Wahpeton Oyate, and I am Dakota. I am twenty-five years old. I am a senior at the University of North Dakota majoring in General Studies with an emphasis on Indigenous Studies and Psychology.

Abstract

Approximately 80% of Indigenous people experience sexual assault, violence, and rape. Little is known about sexual violence intervention programs for Indigenous People, and current interventions do not meet or fit the needs of Indigenous People. 400 Indigenous college students, mean age 24.58 years (SD = 4.68), 77.7% women, 18.8% men, 7.6% two-spirit or trans were surveyed for a study on self-defense between January to August 2021. Survey measures included screening for PTSD symptoms (PC-PTSD), sexual abuse, and MMIW questions. Among these, 221 students were randomly selected for another questionnaire regarding trauma therapies. Overall, 63% of our sample reported both childhood and adult sexual abuse. 50% screened positive for PTSD. Nearly half reported someone they knew as missing or murdered. Participants' perceptions of narrative exposure therapy and written exposure therapy were positive. Lastly, no differences were found in how positively or negatively students rated trauma treatments based on PTSD status. Indigenous voices in sexual violence research are imperative to contribute and develop culturally adapted and modified sexual violence programs for Indigenous people.



LEE QUALLEY
**NATIVE POLLINATORS AND CONSERVATION EFFORTS
IN THE GREENWAY OF GRAND FORKS, ND AND EAST
GRAND FORKS, MN**

Mentor: Dr. Rebecca Simmons

Lee Qualley is a senior working toward a bachelor's degree in Biology. Lee's area of research is within entomology and evolution, though they have an additional fascination with microbiota.

Abstract

Restored habitats need to protect native plants and pollinators. The Greenway is approximately 2,200 acres of natural open space located along the Red River in East Grand Forks, MN and Grand Forks, ND. A wildflower restoration project started in 2005 in several areas along the Red River. To aid in this restoration the City of Grand Forks implements maintenance of the natural and manicured recreational areas, using herbicides, burning, and pesticides to deter weed and mosquito populations. The outcomes of these conservation efforts are unknown. This research examines the impact of conservation efforts and global climate crisis impact on native pollinator phenology. Pollinators were collected on the Greenway before and after pesticide treatments. We dissected specimens to remove the digestive system; then extracted DNA to identify pollinator species and associated microorganisms. Using DNA we are able to determine the species in these communities using cytochrome oxidase I (COI) and 16S ribosomal DNA. Compared the sequences via BLAST to NCBI GenBank database, 98% minimum match for identification. The information collected will be used to discuss the weaknesses and strengths conservation efforts regarding synchrony of plant-pollinator systems.



NICHOLAS RAMOS ***DOES INTELLECTUAL HUMILITY AFFECT BELIEF IN MISINFORMATION?***

Mentor: Dr. Daphne Pedersen

Nick Ramos is an Air Force Veteran and a college senior studying English & Sociology. He is interested in multiple topics related to the field of Education. Nick plans to pursue a PhD in English and has been accepted to the English MA program at UND for Fall 2023.

Abstract

Due to the relative newness of intellectual humility as a concept in the field of sociology, most of the research is related to defining IH and establishing that it is indeed measurable. To that end, there is no one specific definition of IH; however, researchers Tyrone J. Sgambati and Ozlem N. Ayduk claim that “awareness of one’s intellectual limitations [...] may constitute intellectual humility’s most defining feature”. In other words, IH is the measure of one’s willingness to admit that they are wrong or update their knowledge based on input from other sources. This is corroborated by Mark R. Leary, et al., who found in their research that IH scaled positively with similar concepts such as “openness, curiosity, tolerance of ambiguity, and low dogmatism” while staying distinct from them. In my research, I will seek to find the relationship between intellectual humility and susceptibility to misinformation. Using data from Rhodes’ research titled “Filter Bubbles, Echo Chambers and Fake News: How Social Media Conditions Individuals to be Less Critical of Political Misinformation”, I hope to find evidence that supports Leary’s IH scale as well as evince the possibility that having low IH makes one less likely to recognize misinformation. Alongside other sources that focus on the effects of IH in political spheres, I will make connections between political beliefs, susceptibility to misinformation, and IH.



OLIVIA RIKE-NORMAN ***TURNING POINTS IN UNDERGRADUATE*** ***MATHEMATICS***

Mentor: Dr. Ryan Zerr

Olivia Rike-Norman is majoring in Mathematics and Secondary Education with a minor in Middle-Level Education. Olivia is conducting research through the McNair Program with her mentor Dr. Ryan Zerr. She is currently working on finding a turning point for undergraduates in mathematics majors. Olivia plans to graduate in the Spring of 2024 then continue straight into graduate school to pursue a Masters in Teaching and Leadership with a specialization in Mathematics and Principalship. Olivia will then go on to obtain her Ed.D for Educational Leadership, and she hopes to work in all aspects of the education system over the course of her future career.

Abstract

Mathematics is a subject that many students struggle with, and it is not uncommon for students to lose interest or confidence in the subject.

The purpose of this research is to find an educational turning point in undergraduate mathematics courses that deters a student away from a mathematics major. Given the analytics and planning anonymized data about University of North Dakota students (major, classes taken, grades, etc.) we hope to identify landmark courses.



LINNYA SANDERS
SEXUAL VIOLENCE PREVENTION: EXPANDING THE DATA ON VICTIMS & PERPETRATORS OF SEXUAL VIOLENCE TO IMPROVE PREVENTION

Mentor: Dr. RaeAnn Anderson

Linnya Sanders graduated from University of North Dakota in Fall 2022 with a bachelor's degree in Psychology and a double minor in Sociology and Criminal Justice. Some of Linnya's research interests have been in sexual violence and prevention, specifically the difference between male and female perpetrators. Linnya plans on pursuing a PhD in Psychology.

Abstract

The purpose of the current study is to see if questionnaires are measuring adequate data reports from sexual assault victims and perpetrators. The need for this study is highlighted by research that is reporting males to keep the data set valid for perpetration. Through this current study there is a first questionnaire the participant is answering, after the first survey is completed then the participant is interviewed on the questionnaire responses and asked to verbally tell the situation. After the interview, the participant is then asked again to answer a second set of questionnaires. How the research results are showing is that adding in women and transgender to the data set, the data is remaining consistent. There are no significant differences between the survey responses between men, woman and transgendered. Overall, the information being gathered for research is beneficial to include men, woman, and transgender to evaluate effective prevention plans.



ALYSSA STUTLIEN **SCIENCE IDENTITY AND IMPOSTER SYNDROME**

Mentor: Dr. Daphne Pedersen

Alyssa Stutlien is a senior with plans to graduate this fall with bachelor's degrees in both Sociology and Women and Gender Studies. Alyssa works as an undergraduate research assistant under Dr. Daphne Pedersen, with whom she presented her work on Science Identity and Imposter Syndrome last month at the Midwest Sociological Annual Meeting. Alyssa is passionate about studying gender issues, social problems, and family sociology. She is eager to apply to graduate schools this fall, with the end goal of a Ph.D. and being a social researcher onwards.

Abstract

Imposter syndrome describes prevailing feelings of self-doubt, worries of inadequacy, and feelings of insecurity even when evidence indicates success in one's field. Imposter syndrome is an unexplored precursor to ongoing struggles with science identity. Science identity is how a person identifies themselves as a scientist and can be broken into three core components: being knowledgeable in the field, performance of the necessary scientific skills, and recognition from others - being respected by gatekeepers in the field. Those who are already underrepresented in STEM have greater trouble establishing a strong science identity. In this work, we examine how imposter syndrome and science identity intersect and impact STEM students while giving special attention to those who are first-generation, women, and students of color. Data are taken from qualitative interviews with undergraduate students participating in an NSF STEM scholarship program at the University of North Dakota. Understanding how imposter syndrome and science identity align can help improve students' experiences in science and, therefore, their persistence and retention in STEM education and careers, thereby diversifying the STEM workforce.

*Honor his legacy,
create your own*



Thank you!



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