



Undergraduate Research Fall Poster Presentations (Virtual)

Friday, December 4, 2020

Zack Biskupiak - (Eric Garland)

Department of Social Work

UNDERSTANDING THE OPERATIONAL DEFINITION OF MINDFULNESS MEDITATION

Mindfulness meditation and mindfulness based interventions are a promising new area of research in the fields of psychology, social work, and more. In order to conduct effective research on an abstract concept such as mindfulness, we need to have a strong operational definition of what it constitutes. Conducted in tandem with Dr. Eric Garland's Center on Mindfulness and Integrative Health Intervention Development (CMIIND), this research project was to examine the specific mechanisms of meditation

Hannah Blomgren - (Regina Frey)

Department of Chemistry

INFLUENCE OF IDENTITY ON PERCEPTION OF BELONGING AND INCLUSION IN INTRODUCTORY PHYSICS

The purpose of the overall project is to explore how students' perceptions of inclusion and sense of belonging relate to their performance and subsequent retention in introductory STEM courses, and currently, in introductory calculus-based physics courses at the University of Utah. The current academic system for higher education does not retain students in STEM fields equitably, resulting in disparities on a national level for underrepresented groups in the STEM community.

Candace Bryan - (Elizabeth Archuleta)

Department of Ethnic Studies

THE RELATIONSHIPS BETWEEN MUSEUMS AND NATIVE AMERICANS: A CASE STUDY OF THE NATURAL HISTORY MUSEUM OF UTAH

My honors thesis is a case study of the Natural History Museum of Utah (NHMU) through a review of the relationships between Native Americans and museums. I studied the history of museums in the U.S. by talking about expositions that began the U.S. anthropology and museum movement. I also researched the ways that Native American people have influenced museums through collaboration and tribal museums. Using this knowledge, I did a case study on the Native Voices exhibit at the NHMU.

Meghan Burrows - (Adrienne Cachelin)

Department of Environmental and Sustainability Studies

YOUTH, ENVIRONMENT, AND BELONGING

This research project set out to explore intersections of conceptions of environment and environmental justice, specifically how youth understand the connection between "environment" and belonging. Goals for this research project:

- 1-Gain an initial understanding of youth's conceptions of environment
- 2-Have students document assets of their community environments
- 3-Explore how understanding environment as where humans live, work, play, and learn might increase a sense of belonging.

Emily Cebrowski - (Brian Codding)

Department of Anthropology

"WEARY FEET AND FLAKED STONE" TESTING THE PREDICTIVE POWER OF COST PATH ANALYSIS AS A SUITABILITY MEASURE FOR IDEAL FREE DISTRIBUTION

This research project addresses the spatial relationships between the places that prehistoric people lived, and the places they gathered. The Ideal Free Distribution spatial model was used to demonstrate that the lithic quarry was a central focus of the local prehistoric economy of the Lower Dolores River Valley. Research modeling indicates a positive relationship between site density and path suitability.

Alan Chavez - (Elizabeth Craft)

School of Music

MASTER MINDS AND ARTISTS: VISITING INFLUENCERS IN THE PRE-CIVIL RIGHTS ERA

During this past year, I was able to comb through the Utah Daily Chronicle archives and extract information on music faculty and events. I compiled this information into spreadsheets for the University's School of Music History Project. During this process, I was able to glimpse into the past and find an impressive attitude toward civil rights and inclusivity fostered at the U. My presentation will attempt to share that discovery with you.

Mary Chavez - (Rachel Hayes-Harb)

Department of Linguistics

EFFECTS OF INSTRUCTOR ETHNICITY ON NATIVE ENGLISH SPEAKERS: REPLICATION OF RUBIN (1992)

This research replicated various aspects of the Rubin (1992) study, we wanted to see whether the findings in the Rubin (1992) study holds up under different circumstances and among a different population. The Rubin (1992) study tested whether students were having difficulty comprehending NNSTAs due to their accents or whether they were making assumptions about a person's accent solely due to their visages, despite how strong their accents were, or if their accents even existed.

Mitchell Child - (Raymond Cutler)

Department of Materials Science and Engineering

CASTABLE, POROUS INSULATION FOR OXYGEN GENERATION APPLICATIONS

Over the last few months we have researched castable ceramic insulation for oxygen generation applications. This involved researching current state of the art of materials used in the industry and this kind of application. The material we needed to create or improve upon needed to be lightweight, strong, and have good insulation for temperatures up to 1200 degrees C. We decided to try and improve the properties of RESCOR-740 and began by characterizing the current material and then adjusting.

Emma Dean - (Elisabeth Conratt)

Department of Psychology

THE EFFECT OF MATERNAL RESILIENCE ON NEWBORN NEUROBEHAVIORAL OUTCOMES

In this study, we investigated whether maternal resilience can act as a moderator of the negative effects of maternal stress on newborn neurobehavioral outcomes. A sample of 162 pregnant women were assessed on their life stressors and resilience level. Their newborns were assessed according to the NICU Network Neurobehavioral Scale (NNS). Mothers who reported more frequent episodic stress had newborns with lower levels of arousal and attention factors.

Bridget Dorsey - (Maija Holsti)

Department of Pediatrics

HEALTHCARE PROVIDER BIAS IN ESTIMATING HEALTH LITERACY OF PARENTS IN A PEDIATRIC EMERGENCY DEPARTMENT

Health literacy is a growing concern due to its significant effect on clinical communication and health outcomes. This study aims to quantify the ability of providers to estimate health literacy of parent/guardians in a pediatric emergency department and identify descriptive factors that might be related to misestimates of health literacy.

Fatima Faizi - (Man Hung)

Department of Orthopaedics

TYPE 1 DIABETES SELF-CARE: YOUR DAILY DOSE OF DIABETES

My research on the factors associated with type 1 diabetes was conducted online through pubmed. Diabetes is a disease that affects people across the lifespan, from childhood to adulthood, one can be diagnosed with diabetes at any age and at any time in their life. There are two types of diabetes type 1 (T1D) and type 2 diabetes (T2D). This research is focused specifically on T1D. There are many factors that are associated with T1D such as sleep deprivation, high fructose corn syrup, and caffeine

Valerie Fernandez - (Daniel Leung)

Department of Internal Medicine

UNDERSTANDING THE INCIDENCE AND RISK FACTORS ASSOCIATED WITH TRAVELERS' DIARRHEA

The aim of this study is to determine the incidence and risk factors associated with travelers' diarrhea. To do this, I analyzed data from post-travel surveys and completed bivariate and multivariable analysis. Factors with higher association to travelers' diarrhea based on the multivariable analysis include travelers who visited SE Asia and/or Africa, went with a larger group, visited rural/countryside regions, had a longer trip duration, and used TD prevention medications/supplements.

Izzy Galland - (Bryn Dentinger)

Department of Biological Sciences

THE PHYLOGENETIC ENIGMA OF THE PSYCHEDELIC MUSHROOM GENUS, PSILOCYBE

This research project investigates the biological relationships between species in Fungi genus Psilocybe. The genetic database for Psilocybe, psilocybin-producing mushrooms, is lacking sufficient data due to only relying on a small fraction of known species for sequencing. This leads to discrepancies in the phylogeny. By contributing to this research, we will generate a comprehensive, species-level DNA barcode database for Psilocybe which will serve as a reference for future Psilocybe research.

Jamie Goetz - (Shannon Boomgarden)

Department of Anthropology

EXPERIMENTAL ARCHAEOLOGY: MODELING THE COSTS OF GROUNDSTONE TOOL-USE FOR MAIZE CONSUMPTION IN RANGE CREEK CANYON, UTAH

This experiment adds to the data set exploring how costly it was to be a Fremont farmer in Range Creek Canyon, UT, and why they made the decisions they made? This research aids in understanding this question by gathering quantitative data (kcal/hour) on the cost of processing maize for consumption. In addition to the quantitative data, participants in actualistic experiments provide many observations about the process of grinding maize that ethnographic/archaeological records cannot provide.

Chris Granger - (Rachel Hayes-Harb)

Department of Linguistics

REPLICATION OF RUBIN (1992) STUDY ON THE EFFECTS OF ETHNICITY ON STUDENTS' PERCEPTION OF TEACHER EFFECTIVENESS AND ACCENT.

In this study we are replicating Rubin (1992) with materials provided directly from Donald Rubin. Rubin (1992) showed that undergraduate students will often perceive an accent and rate the instructor lower when the instructor is of a different ethnicity, even when the audio samples are exactly the same. We replicated this study as closely as possible and also chose to extend it by recruiting participants from all age groups and locations, rather than just undergraduates as Rubin (1992) did.

Luke Hardy - (Rachel Hayes-Harb)

Department of Linguistics

RACIAL BIASES AFFECTING UNDERGRADUATES' COMPREHENSION OF INSTRUCTORS, REPLICATION OF RUBIN (1992)

This study is a replication of Rubin 1992, which tested to see if perceived race of instructor affected the students' comprehension of the instructor.

Tara Hogan - (Professor Hayes-Harb)

Department of Linguistics

UNDERGRADUATE ETHNOCENTRISM

This poster and recording represent the efforts made to replicate Donald Rubin's 1992 study, "Nonlanguage factors affecting undergraduates' judgments of nonnative English-speaking teaching assistants."

Sarah Hunt - (Jeff Rose)

Department of Health, Kinesiology, and Recreation

ADDRESSING AIR QUALITY IN THE SALT LAKE VALLEY THROUGH THE USE OF SERIOUS GAMES

This research is focused on addressing air quality in the Salt Lake Valley through the design and implementation of a serious game. The project is still in the early stages as interviews are being conducted to inform game design. The interview process and analysis shows important finding regarding air quality in the Salt Lake Valley that will guide the game design process.

Su Jin Hwang - (Lee Raby)

Department of Psychology

THE ASSOCIATION BETWEEN PRE-EXISTING DEPRESSIVE SYMPTOMS AND COVID-19 RELATED STRESS AMONG ADOPTIVE PARENTS

Prior studies have shown the association between depression symptoms and the impact of COVID-19 pandemic among the general population. This study aims to examine whether level of depressive symptoms prior to the pandemic is associated with various outcomes during the pandemic among adoptive parents: overall level of stress related to COVID-19, sleep quality, and distress due to their family's reduced access to positive social interactions due to social isolation.

Austin Johnson - (Adriana Coletta)

Department of Health, Kinesiology, and Recreation

EFFICACY OF A HOSPITAL-BASED EXERCISE PROGRAM ON PHYSICAL OUTCOMES LINKED WITH SURVIVAL AMONG CANCER SURVIVORS

In this retrospective study, we assessed change in cancer treatment-related side effects linked with survival, such as cardiorespiratory fitness, physical function, and muscular endurance after participation in Huntsman Cancer Institute's clinical exercise oncology program called the Personal Optimism With Exercise Recovery (POWER) program.

Aspen Johnston - (Rachel Hayes-Harb)

Department of Linguistics

CHANGING SENTIMENTS - THE CHANGING NATURE OF REVERSE LINGUISTIC STEREOTYPING

We attempted to replicate Rubin (1992) and surveyed 21 participants across two matched-guise conditions using a listening task and homophily task to determine if their responses showed evidence of reverse linguistic stereotyping. Results were incredibly similar across both conditions, meaning we were unable to replicate the original findings.

Bryce Larsen - (Robby Bowles)

Department of Bioengineering

PROMOTING OSTEOGENESIS USING CRISPR-DCAS9-VPR

Using CRISPR-dCas9-VPR we upregulated genes in adipose-derived stem cells to see if any played a role in osteogenesis. CRISPR-dCas9-VPR is a modified form of CRISPR-Cas9, instead of cutting DNA it attaches onto and helps the cell express the gene following the place of attachment. We used a modified cell line of adipose-derived stem cells that would fluoresce if undergoing bone cell differentiation. After upregulating thousands of genes we noticed some had an effect on osteogenesis.

YINGRI LI - (Kent Lai)

Department of Pediatrics

AFFINITY PURIFICATION OF HISTIDINE-TAGGED GALACTOSE-1 PHOSPHATE URIDYLTRANSFERASE (GALT)

The main goal of this project was to develop and refine the purification process of GALT, in order to use this protein for further identification of inhibitors.

Veronica Lukasinski - (Annie Fukushima)

Department of Ethnic Studies

VISUALIZING GENDER-BASED VIOLENCE POLICY DATA COLLECTION FOR THE STATE OF UTAH

This presentation introduces the still ongoing process of reviewing gender-based violence policies found in the state of Utah. The methodology is provided and preliminary findings are explored. Ultimately, this research will contribute to the "Visualizing Gender-Based Violence" project conceived by the University of Utah's Gender-Based Violence Consortium, which will include resources to various social services, along with policy information.

Kitsel Lusted - (Michael Free)

Department of Materials Science and Engineering

ECONOMIC EXTRACTION, RECOVERY, AND UPGRADING OF RARE EARTH ELEMENTS FROM COAL-BASED RESOURCES

Rare earth elements have properties that make them useful in many applications. This project analyzed the application of biooxidation to the extraction of REEs from coal waste as a means of economically separating REEs from their constituents. Analysis of the recoveries showed that the primary element in the recovery was Yttrium (Y) at 22%, followed closely Cerium at 21% of total recovery.

Sally Matthews - (Leslie Knapp)

Department of Anthropology

DETERMINING KINSHIP IN WILD SAVANNA CHIMPANZEES (PAN TROGLODYTES VERUS) FROM FONGOLI, SENEGAL.

Analyzing genetic diversity in a population can be valuable in anticipating the possible effects environmental change can have on a population. My project will be to identify microsatellites in nuclear DNA to create unique genotypic profiles of individual chimpanzees to examine relatedness, assess genetic diversity in the populations. I aim to test the hypothesis that male chimpanzees will be more related in the population than the female chimpanzees.

Ian McCollough - (Raymond Cutler)

Department of Materials Science and Engineering

CASTABLE POROUS CERAMIC INSULATION

We have been making use of a standard vibrational plate in order to mix ceramic insulation. We have been using an industrial powder and base, and through the use of additives have been trying to alter its physical properties, such as density, strength, and thermal conductivity. We have been doing this through the use of poreformers such as corn starch and alcohol. In the future we hope to scale up production and begin testing for an altering the thermal conductivity of the cast material.

Anthony Muradas - (Katarina Felsted)

Department of Nursing

A MINDFUL APPROACH TO PERCEIVED STRESS FOR OLDER ADULTS RECEIVING REHABILITATION SERVICES IN LONG-TERM CARE (LTC)

Stress is common among older adults experiencing the need for health care services such as long-term care. High levels of stress have been linked to major physical and psychological health problems. Mindfulness has been shown to create positive outcomes for mental and physical health, including stress reduction. In an attempt to understand if mindfulness interventions can improve outcomes of perceived stress my study aims to evaluate changes in perceived stress after a mindfulness intervention

Jimena Murillo - (Zac Imel)

Department of Educational Psychology

PSYCHOLOGY AND INTERVENTION USE

The following research study analyzed the components of psychotherapy. The effectiveness of psychotherapy has been attributed to a combination of specific interventions, techniques, and common elements (common factors) that are widely used across different approaches in therapy (Wampold & Imel, 2015). We hypothesized that therapists who have a high rating of common factor items will utilize more specific non-CF interventions compared to therapists with low common factor ratings.

Riley Murray - (Diego Fernandez)

Department of Geology and Geophysics

BIOAVAILABLE STRONTIUM FOR ARCHAEOLOGICAL STUDIES IN MODERN MANHATTAN, NEW YORK

200 burials were uncovered in Manhattan's Spring Street Cemetery. These individuals represent a diverse population, and offer a great opportunity for studying population migration. Our research uses strontium isotopes to distinguish between locals and migrants in Manhattan. We are particularly interested in a key question: can we use the Strontium 87/86 isotopic ratio as an elemental tracer to establish a local and nonlocal human population in a complex urban environment like modern Manhattan?

Nate Nellis - (Scott Schaefer)

Department of Finance

ECONOMETRIC ANALYSIS ON THE IMPACT OF WATER RATES ON RESIDENT USAGE AND CITY REVENUE: A STUDY IN SALT LAKE COUNTY, UTAH

My project examines the effect a change in municipal water rates has on water consumption. City officials estimated a 5% increase in water rates would yield a 5% increase in city revenue, but the year after water revenue decreased by 1%. Using linear regression I found average usage should have decreased between 119-238 gallons per month for the average household after the rate change but that the average monthly bill should have risen by \$3.43, resulting in an increase in revenue of 1.5-4.2%.

Billy Nguyen - (Aaron Puri)

Department of Chemistry

ELUCIDATING THE MOLECULAR MECHANISM OF ACTION OF THE MICROSCLERODERMINS

Methane-oxidizing bacterium *Methylobacter tundripaludum* makes a natural product that inhibits the growth of the model yeast *Saccharomyces cerevisiae*. Genetic studies and analytical chemistry strongly suggest this compound is a microsclerodermin. Our results from the project show that yeast in log phase are much more susceptible to the compound than stationary phase cells. The result supports the hypothesis that the microsclerodermins have a specific molecular target worthy of further investigation

Jens Nilson - (Annie Isabel Fukushima)

Department of Ethnic Studies

CHILD LABOR TRAFFICKING AND THE CHILD WELFARE SYSTEM

The purpose of this research was to identify deficiencies in the identification and response to child labor trafficking in the current welfare system. This study accomplishes the following: 1) contributes understandings to child welfare system responses to human trafficking; 2) gathers information about the types of labor trafficking occurring and 3) furthers research on child labor trafficking, with particular attention to responses during COVID-19.

Adriana Payan-Medina - (Ramkiran Gouripeddi)

Department of Biomedical Informatics

CHARACTERIZATION OF SATELLITE-DERIVED AIR QUALITY MEASUREMENTS IN HEALTH APPLICATIONS

Generally, air pollution data is obtained from on-ground air pollution monitors. However, on-ground monitors limit available AQ data due to the lack of monitors. In this research project, we utilized NASA satellite data to compare its feasibility to obtain spatially and temporally accurate chemical pollution values. Through statistical analysis, satellite data was compared to on-ground air quality data. We mention the benefits and drawbacks of including satellite data in health research.

Marcel Petersen - (Rachel Hayes-Harb)

Department of Linguistics

RUBIN (1992) REPLICATION

We performed a replication study of Rubin (1992), which examined non-language factors affecting undergraduates' judgements of nonnative English-speaking teaching assistants. Our study's participants listened to a lecture paired with an image of either a "white" or an "Asian" lecturer. They then took a comprehension test. The participants under the "white" lecturer condition were more accurate on this test on average and rated the "white" lecturer as more competent than the "Asian" one was.

Zoe Price - (Rachel Hayes-Harb)

Department of Linguistics

BEYOND A FACE: REPLICATION OF RUBIN 1992

A replication study of Rubin 1992, where he examined undergraduate students' RLS when listening to non-native teaching assistants. Despite being online, this study followed most of the same procedures, including a matched guise technique. The study finds that there may be some small difference in how well students understand the same voice, depending on whether the face is "Asian" or "Caucasian."

Mario Ramirez-Arrazola - (Thomas Maloney)

Department of Economics

ADDING UP THE COST OF EXCLUDING UNDOCUMENTED UTAHNS FROM STATE AND FEDERAL COVID-19 RELIEF

My research paper looks at the unfair nature and economics implications of leaving out the Utahn undocumented community from COVID-19 state and federal relief aid. There is quantitative research into the amount of money they were barred from and its implications.

Lyndsay Ricks - (Donald Feener)

Department of Biological Sciences

DOES THE AMERICAN COCKROACH'S PERSONALITY AFFECT ITS ABILITY TO FORM SPATIAL LEARNING ASSOCIATIONS?

In this project, I tested 34 American cockroaches (*Periplaneta americana*) for traits which are known to be consistent within individuals and vary between them (termed 'personality' traits by prior researchers) and examined how they were related and how they relate to the cockroach's ability to learn, as well as whether research conducted on other cockroaches' personalities could be extended to *P. americana*.

Gabi Siu - (Anne Mooney)

School of Architecture

CONTEMPORARY DESIGN IN THE AMERICAN WEST THROUGH THE LENS OF FILM

Mason Stephens - (David Strayer)

Department of Psychology

MINDFULNESS AND P300 CORRELATIONAL RELATIONSHIP TO TIME SPENT IN NATURE

Looked at the relationship between time spent in nature and the P300 ERP and self-reported mindfulness ratings. Found that mindfulness increased in nature and that the P3a decreased as mindfulness increased.

Kaitlyn Stevens - (Clement Chow)

Department of Human Genetics

IDENTIFYING RNAI MODIFIERS LEADING TO CELLULAR APOPTOSIS IN RETINAL DEGENERATION

Our lab performed a study that examined the effect of genetic variation on *Drosophila* models; using a genome-wide association study, we identified candidate modifiers. The majority of these candidate genes were ones that influenced variation in retinal degeneration played a part in apoptosis. I helped perform a new apoptosis-specific screen to find additional modifier genes. Among several hits, here I will present data on one promising gene, *bru1*.

Michael Tao - (Martin Tristani-Firouzi)

Department of Pediatrics

USING COLLAGEN-BASED HYDROGELS TO ENHANCE CARDIOMYOCYTE DIFFERENTIATION AND DIRECT STRUCTURAL ALIGNMENT IN-VITRO

The proposed project will optimize engineered collagen-based hydrogels that will serve to mimic the local extracellular matrix to guide human pluripotent stem cell-derived cardiomyocytes towards anisotropic alignment. The project seeks to optimize electromechanical coupling while providing topographical guidance for hPSC-CMs in vivo.

Mack Tawa - (Courtney Wagner)

Department of Geology and Geophysics

DEVELOPMENT OF THE BINARY CATEGORIZATION FOR MAGNETOFOSSIL ROBUSTNESS MODEL (BCMRM)

Magnetotactic bacteria produce magnetite that can be preserved through time. A model was created in order to decipher whether or not a sample contains a magnetofossil vs. an inorganic form of magnetite/greigite. This model incorporates new methods that have previously not been discussed in related reviews.

Madi Tripp - (Linda Edelman)

Department of Nursing

ADDRESSING OPIOID USE IN CARBON COUNTY, UTAH

My research focused on trying to understand opioid use in Carbon County, Utah. I conducted interviews with 9 community stakeholders that addressed existing barriers, ideas for improvement, resources that are already working, and perceived impact on the community. These stakeholders included healthcare professionals, government employees, and public health representatives, all individuals who have a unique connection with and perspective of opioid use in the county.

Joshua Urry - (Robert Vlisides-Henry)

Department of Psychology

THE MEDIATING ROLE OF COPING BEHAVIORS IN THE RELATION BETWEEN PARTNER RELATIONSHIP QUALITY AND INFANT STRESS

This study examined the association between a mother's partner relationship quality during pregnancy and her infant's stress signs after birth and if the mother's coping behaviors during pregnancy mediated this relation. It was found that partner relationship quality during pregnancy was not associated with infant stress signs and coping behaviors did not act as a mediator. However, coping behaviors did act as a mediator between partner relationship quality and depression.

Annie Walton - (Lisa Taylor-Swanson)

Department of Nursing

SEX DIFFERENCES IN DISPOSITIONAL MINDFULNESS AND ITS EFFECT ON ACUPUNCTURE TREATMENT OUTCOMES

This study aimed to improve acupuncture program outcomes for patients who rated their chronic pain as three or greater on a scale of 0-10 for three or more months. The purpose of this thesis was to investigate whether males and females differ in dispositional mindfulness after receiving an acupuncture treatment with or without a mindfulness intervention.

Joe Wassweiler - (Cord Bowen)

Department of Multi-Disciplinary Design

FIXING TUITION INFLATION

Improved information sources could be most impactful in the process of applying for schools where students would benefit from easy access to critical information such as average return on investment based on chosen major and school, realistic comparison of overall costs, and amount of subsidy they can receive before applying for schools.

Tara Zamani - (Neil Cotter)

Department of Electrical and Computer Engineering

SPIKING NEURAL NETWORK MODELING AND AN XOR APPLICATION

What is the best approach for modeling the human brain using technology?

We believe that Spiking Neural Networks are the next step forward to more accurately representing biological neuron functionality. Through our research, we have developed our own SNN transfer function and applied our SNN model to a common XOR application to both showcase the model's validity and the utility of having a transfer function as a tool during development.

Lauren Ziegelmayr - (Emily Scott)

Department of Psychology

EXAMINING CHANGES IN PHYSIOLOGICAL STRESS LEVELS AFTER EXPOSURE TO NATURE

Advancements in technology and the urbanization of society has resulted in an overuse of directed attention. Previous research has discovered that recovery happened faster when exposed to nature, rather than urban environments. The current study aims to measure physiological changes after the presence of nature, using electrocardiography (ECG) to measure resting respiratory sinus arrhythmia (RSA) and heart rate (HR) values of participants.