WELCOME

On behalf of the Office of Undergraduate Research, welcome to Weber State University's 13th Annual Undergraduate Research Symposium and Celebration. This symposium celebrates the scholarly, creative and research accomplishments of our students and their mentors. Faculty-student collaboration in the research process provides an opportunity for personal and professional growth that few other activities match. Together, through active research agendas and creative endeavors, our students and faculty explore the boundaries of their disciplines and expand our realm of knowledge. This partnership enhances the potential of our students to think independently, creatively and critically. Discovery through research encourages a sense of relevance and excitement in the classroom as new knowledge is applied to society, industry and education.

These presentations are evidence that the pursuit of knowledge and creative expression are an integral part of the campus culture and Weber State University. Please join us in celebrating the accomplishments of our students and their research mentors. We hope that this symposium will inspire others to continue this form of profound learning and intellectual engagement.

ACKNOWLEDGMENTS

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WEBER STATE
UNIVERSITY
Office of
Undergraduate Research

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ORAL PRESENTATION

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Author Shanalyn Wheeler

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1:30 p.m. **Linking Preparation and Practice Through Professional Involvement for Pre-Service Teacher**
Author Nicholle Badger | Bailie Clark

1:45 p.m. **Instagram Hashtags Used as Speech Codes by Young LDS Mothers**
Author Hayley Harris

2 p.m. **New Sincerity as a Critical Literary Theory: Backing it up and Moving it Forward**
Author Elizabeth (Deanne)Tanner

PERFORMANCE

SESSION 2

BALLROOM B

1:15 p.m. **The Living Web: A Choreographic Approach to Human Connection**
Author Geoffrey Rosenberg

TELITHA E. LINDQUIST COLLEGE OF ARTS & HUMANITIES

Nonverbal Cues Indicating Stress in Law Enforcement

Author BEN BRANDLEY
Mentor RYAN CHEEK

Oral Presentation

Communication

Law enforcement is considered one of the most stressful occupations in the world. This research is based in the Expectancy Violations Theory by Judee Burgoon, which suggests that humans alter behaviors when their expectations are suddenly infringed upon. When law enforcement officer's expectations are violated, they react under stress, and not always in the best ways. Content analysis of randomly selected episodes from the documentary style TV series, COPS, was conducted. The TV episodes are essentially a virtual ride along. Each episode consisted of three segments, with different law enforcement officers. During less than 60 minutes of content analysis, 32 nonverbal cues indicating stress were observed. Findings of the research conclude that the two main nonverbal indicators of stress in law enforcement officers are: 1) loud voice and rapid speech, and 2) anger facial expression. Because of the recent outbursts of anti-police sentiment in the U.S., future research in this field is crucial in maintaining safe communities and improving the quality of life for both citizens and law enforcement officers. Communication is a powerful tool that can provide safety and build rapport.

Instagram Hashtags Used as Speech Codes by Young LDS Mothers

Author HAYLEY HARRIS
Mentor ANNE BIALOWAS

Oral Presentation

Communication

The Speech Code Theory is defined by Gerry Philipsen (creator of the theory) as, "A historically enacted, socially constructed system of terms, meanings, premises, and rules pertaining to communicative conduct". This theory assumes that where there's a distinctive culture there is a distinctive Speech Code. The use of Speech Codes through online use is a concept that needs further research. The Speech Code community of young LDS mothers (ages 18-30) and their use of Speech Codes through Instagram hashtags will be the focus topic. This research will allow us to hypothesis that there is a presence of Speech Code Communities through Instagram hashtags and it will show specific Speech Codes used by young LDS mothers. The complete study will review literature of Speech Codes Theory, Instagram Hashtags and Young LDS mothers. Concepts found within the Speech Code Theory such as multiplicity and honor will also be discussed.

Which Call-to-Action Invitations Effectively Increase Total Subscribers On YouTube?

Author MATTHEW HAVERTZ
Mentor DREW TYLER

Poster 38, Session 1

Communication

Many YouTube videos end with a call to action. Matthew Havertz, an undergraduate student at Weber State University, produced a YouTube video series to test which call-to-action techniques effectively increased YouTube subscribers. Martha Hunt, a seamstress from Kaysville, acted as a YouTube channel host and instructor in the video series. Data was collected from YouTube Analytics. Three methods for soliciting YouTube subscribers were used in this study: A call to action at the end of the video, a call to action at the beginning of the video, and an incentivized call to action at the beginning of the video. In addition to these three techniques, a control video was used. The call-to-action technique at the end of the video was the most effective at gaining new YouTube subscribers. Further tests with larger sample sizes need to be completed. Statistical correlation cannot be proven with the data.

From History to the Stage

Author KATIE ROGEL
Mentor ERIN CARIGNAN

Poster 39, Session 1

Performing Arts

In theatre, costumes are translations of history. This exhibit: From History to the Stage showcases examples of these differences in translation. Special garments from the Weber State University Historic Costume Study Collection are contrasted with theatrical costumes of the same period. The time periods from which the garments originate, range from the 1860s to the 1980s. This exhibit on display in the Union Art Gallery is the premier of Weber State University's Historic Costume Study Collection. Research was conducted at the Costume and Textile Study Collection of the Los Angeles County Museum of Art. Historic garments can tell us so much about history because they represent a person's identity and the influence of events happening around that person. When designers bring that history to life, they depend on historic research in order to execute a true and meaningful design. By using historic garments as primary research materials and comparing them to executed costume designs that embody the same time period, we can see how designers use their research, adapt for a modern audience, adapt for script, and tell an important story on stage.

The Living Web: A Choreographic Approach to Human Connection

Author GEOFFREY ROSENBERG
Mentors AMANDA SOWERBY
ERIK STERN

Performing Arts

Performing Arts

There is an invisible thread that exists between all life forms. Though we may not see it, we are drawn to its force, finding ourselves connecting with something, a sensation of belonging that ties us to something larger. We see it in the actions of others almost daily. Nurses helping the ill to sit up, soldiers saluting those who have fallen, strangers lending a kind hand to those in need; these are all movements based upon some connection between people. These connections rely on the physical actions of humans, denoting movement as their form. In other words, it's a dance. This dance of connection and human bond is the aim for this project. Through the collaborative efforts of dance and socio-political studies, we are creating a choreographic suite to better understand our shared connection, paying close attention to its affect on the drastic suicide rates in Utah. This four-dance suite will be presented in the Eccles Theater inside the Val A. Browning Center at Weber State University from April 27th-29th at 7:30 PM. It will be a free performance and guests of all backgrounds are encouraged to join us in sharing this experience.

Scenic Design for The 25th Annual Putnam County Spelling Bee

Author JESSICA SUME
Mentor JENNIFER KOKAI

Poster 40, Session 1

Performing Arts

The 25th Annual Putnam County Spelling Bee tells the story of a local spelling bee and the six adolescents that compete for first place. This modern musical captures not only the experience of competing in a spelling bee, but captures the experience of adolescence. I was immediately inspired by the amount of audience participation in the sho. Audience members are invited to come onstage and be "guest spellers," participating in the Bee alongside the actors. I wanted to create a space that engaged the audience and cast in a mutual, shared experience. The idea of shared experience inspired me to recapture the feeling of being in junior high through my design. Rather than invoke the serious and upsetting memories of junior high that most carry (such as bullying, body image struggles, etc...), I wanted to invoke a nostalgic feeling, the memories of the idealistic junior high experience we all wish we had. I was drawn to classic high school films and TV shows from the 1980's, 1990's, and early 2000's. I was greatly inspired by the look and feel of these films, but I was most inspired by the 1990's television classic, Saved by the Bell. which I felt captured the quirkiness of junior high school. My objective in design was to capture the delightful awkwardness of junior high school. I wanted to create the feeling of being a small fish in a big pond. To achieve this, my design includes representations of iconic school architecture, such as exterior stairwells, lockers, and a basketball hoop. I choose a warm color palette of reds, browns, oranges, and yellows to represent the intensity of the Bee, and the emotional intensity of junior high school. The warm color palette was also intended to contrast nicely with the dark blue architecture found in WSU's Allred Theatre. I employed the use of straight lines rather than curves, to show the logical way the spellers view the world.

New Sincerity as a Critical Literary Theory: Backing it up and Moving it Forward

Author
ELIZABETH (DEANNE) TANNER
Mentor SALLY SHIGLEY

Oral Presentation

English

In recent years, literature and art critics have seen a small, but rapidly growing amount of scholarly commentary on a cultural movement called post-postmodernism, or more creatively, The New Sincerity. Its main emphasis is anti-irony and down-with-cynicism. New Sincerests declare it is now cool to care. People are encouraged to be sincere and truthful in their expressions – be that art, literature, media productions or daily life. Some articles claim New Sincerity's transformation of popular culture started with Indie music bands in the 1980s and Stuckism art in the late 1990s, however, this "new" movement has philosophical roots that go back even farther. It probably began in the late 1960s but was overshadowed by more popular postmodern ideals. In the last decade New Sincerity has gained attention not only as a rising cultural movement but also as a cutting edge critical theory for literature. As it is still in its formative stages, critics, philosophers and scholars are still solidifying the core components. In order to progress and become a valid, widely utilized literary theory, New Sincerity needs, like the other critical theories, a general rubric, or a set of questions one can ask about a text to determine whether or not it can be classified as a New Sincerity work. My paper develops such a rubric, outlines goals for further research such as tracing New Sincerity's nascent transformation from literary fiction into popular fiction, and suggests ways to bring this distinctive new theory into broader consciousness.

Employee Motivation and the Impact of Incentive

Author JENNIFER WEIGHT
Mentor SARAH STEIMEL

Poster 37, Session 1

Communication

Employee motivation has always been an area of concern in the business world. (Milne, 2007) Some success has been found by implementing rewards and incentive programs. (Milne, 2007) These programs are designed to reward those employees with high motivation by rewarding them for meeting or exceeding certain expectations. A study was conducted to measure employee motivation and determine if and how the incentive offered in the program impacted employee motivation. A survey of 44 employees found that employees do have preferences for the incentives offered in several areas including individual incentives over group incentives and monetary incentives over time off. If an employee's preferred incentive were offered they may be more motivated to achieve the required expectations. Patricia Milne, (2007) "Motivation, incentives and organisational culture", Journal of Knowledge Management, Vol. 11 Iss: 6, pp.28 – 38.

JOHN B. GODDARD SCHOOL OF BUSINESS & ECONOMICS

Professional Sports: Economic Impact Analysis on State Level

Author JAMES BREITWEISER
Mentor JENNIFER GNAGEY

Poster 35, Session 1

Economics

I want to know if a state with a professional sports team receives an economic benefit. The result of my research question and findings can bring to light a better answer to this question than previous studies. I plan to attain this by studying different pieces of information and data left out in previous attempts. My personal hypotheses on my research topic after reading several articles and analyzing data, is I will find an economic benefit to local communities in the short run and see a stabilization in the long run. I will be employing an event study approach in my analysis. The relocation of teams or expansion event in each league is the event in my analysis. I will be using cross-sectional data across state's for the four major professional leagues, NFL, NBA, MLB, and NHL. I will create three separate models each interchanging the independent variable from Per Capita Income, to Tax Revenues, and then to Employment/ Unemployment Rates. I will use focus dummy variables to account for state's housing a professional team and winning championships. My data will be gathered by secondary sources online including FRED, BLS, and BEA along with sports websites like ESPN and ABC sports.

Estimating the Magnitude of Food Waste and Hunger in Utah

Author JENNIFER NEAL

Mentor SHANE SCHVANEVELDT

Poster 36, Session 1

Supply Chain Management

Though food is a staple for survival, some evidence suggests that as much as 40% of food in America gets thrown away every year. Usable food is discarded at each level of the supply chain, with negative effects on the environment, economy, and society. Discarded food costs millions of dollars for landfills to manage, and it eventually breaks down to produce methane gas which contributes to climate change. This wasted food also represents a financial loss to producers, consumers, and the economy overall. Furthermore, the existence of food waste presents a stark contrast with the societal problem of unmet food need and hunger among a significant number of Americans. To bring the issues of food waste to focus, this research examines the state of Utah as a case study. It derives an estimate of the magnitude of food waste in Utah with a breakdown according to its major sources, and compares it to an estimate of unmet need for the food insecure population of Utah. Based on a literature review, this research also creates a conceptual framework for examining supply chain practices contributing to food waste. Primary and secondary sources are used to identify case studies of best practices for reducing food waste by businesses in Utah and at the national and global level. This conceptual framework and best practice case studies provide guidance to businesses on how to reduce food waste and improve the environmental, social and economic sustainability of Utah's food supply chain.

JERRY AND VICKIE MOYES COLLEGE OF EDUCATION

Linking Preparation and Practice Through Professional Involvement for Pre-Service Teacher

Author NICHOLLE BADGER
BAILIE CLARK

Mentor SHIRLEY DAWSON

Oral Presentation

Special Education

New teachers struggle in the first year of teaching. Many experience a "turbulent landing" when beginning their careers (Kardos & Johnson, 2008). To alleviate the challenges new teachers, face, induction programs were developed and designed. Induction programs supporting new teachers with mentoring and co-teaching have increased (Hirsch, et al., 2009). Although mentoring is often used to support new teachers, they are mixed results on its efficacy (What Works Clearinghouse, 2015) and pre-service teachers are rarely included in mentoring models. Despite the rise in induction programs, awareness and use, teacher shortages continue to be chronic and acute. As a student panel, we presented to professors from around the country on how being in the Council for Exceptional Children (CEC) has benefitted us and will continue to keep us engaged in the field of special education. During the presentation, we gave examples to the professors of our experience and how our connections will keep us connected to our field of study. The experiences we have had have provided us with further knowledge, mentors, and resources to make us successful as educators. Because of our involvement in the CEC, we have could have an expanded network, and gain access to valuable resources. Our presentation went great! We could have conversations with professors on a more personal level. We could provide some insight on what a professional organization can do to benefit their current and future students. In the beginning, we shared our experiences and what worked for us on a personal level and what has worked for as group. Then we had a more open form where we had the audience participate in open discussion. The group talked about what they were currently doing and asked the panel various questions.

Exploring Links Between Trait-Mindfulness and Stress in Parents

Authors KAITLYNN CAMPBELL
MEGAN HILLS
IO LONLEI
REBECCA MIKKELSEN
SUSANNE SAVAGE

Mentors DANIEL HUBLER
TERI HENKE

Poster 30, Session 1

Child and Family Studies

This research explored the relationship of stress between the practice of mindfulness and parent-child relationships. Mindful people recognize their own thoughts and feelings but do not judge them based on a moral compass of right and wrong. Choosing to practice mindfulness can reduce stress and help parents deal with day-to-day setbacks and frustrations. A sample of 75 parents responded to an online survey assessing stress levels, trait mindfulness, and parental openness. Bivariate correlation tests indicated a negative and significant association between parents' trait mindfulness and their levels of stress, $r(75) = -.56$, $p < .001$. Meaning that as one's trait mindfulness increases their stress levels decrease. As parents practice being more mindful not only will their stress levels decrease but they may be less emotionally reactive in their interactions.

Insight to Family Sciences From Work with Community Partners: A Student & Community Perspective

Author COURTNEY CONDIE

Mentors MONICA WILLIAMS
PAMELA PAYNE

Poster 29, Session 1

Child and Family Studies

The Center for Community Engaged Learning at Weber State University partners with local community organizations to create connections and opportunities for the betterment of the community. Weber State students are then able to volunteer their time, efforts, and skills to be of service to these partners. Students have a number of venues with which they can and do engage their communities. Through direct service, students are exposed to diverse family units within the communities in which they serve. As a Child and Family Studies major, I am continually learning about the National Council on Family Relations (NCFR) content areas for Family Life Education. I will talk about my experiences as a student volunteer through my coursework and as a Center for Community Engaged Learning (CCEL) Community Research Team (CRT) member, and how I have been able to apply and see NCFR Family Life Education Content Areas in different aspects of the community. Working in the community has impacted me in a profound way because I have been able to see theories in family science come alive. It has further inspired me to become a certified Family Life Educator (FLE) to continue to apply family life science theories to community life.

Obtaining a Representative Sample in Community Research

Authors YOLANDA FREDRICKSON

Mentor MONICA WILLIAMS

Poster 31, Session 1

Child and Family Studies

Obtaining a Representative Sample through Quota Sampling, Time-Location Sampling, and Cooperation with Community Leaders Yolanda S. Fredrickson and Monica Williams Community research is one way for city governments to learn about the public opinion of residents. In 2015 South Ogden City government partnered with Weber State University to survey city residents, but ethnic minorities were not well represented in the final sample. The current research aims to obtain a more representative sample to ensure that ethnic minority groups are represented. Based on our experiences with this research project, this presentation will highlight the research techniques that are useful in obtaining representative samples of ethnic minority groups, particularly the collaboration with community leaders in time-location sampling and recruitment. Previous research on minority representation in social surveys has shown that community-based approaches using community leaders are useful in recruiting hard to reach populations, as are strategies such as time-location sampling and quota sampling. The current study employs these techniques by selecting various sampling locations to recruit target populations of Hispanic and African-American residents of South Ogden, Utah. By examining these various approaches, the presentation will provide other researchers with the strategies necessary to increase the representation of racial minorities.

Perceptions of the Medical Setting

Author KYLEE HURD
Mentor PAMELA PAYNE

Poster 26, Session 1

Child and Family Studies

This study is looking to determine how childhood healthcare experiences influences adults' attitudes and perspectives of healthcare. For instance, does childhood trauma in a doctor's office keep an adult from going to the doctor to receive care from the anxiety the traumatic event produced. It will be explored to determine if there is a relationship between parents' experiences and avoidance of taking children to receive medical care. Child Life Specialists ensure children of all ages have a developmentally appropriate explanation of what is happening to their body or the body of their sibling or parent (Thompson, 2009). Knowledge of a Certified Child Life Specialist (CCLS) among the general population and the role they play in anxiety reduction in the medical setting from interventions practiced by CCLS services will also be assessed. Approximately 200 participants will complete a survey, which includes various information about experiences in medical settings. Measures include demographic measures, measures of attitudes and perceptions toward the medical setting, measures of knowledge and recognition of Child Life Services, measures of how these subjects who have children respond to their child's medical questions, and measures of perspectives on why some people are more susceptible to anxiety and fear of the medical setting. The results of this research are important to current literature as results fill a gap in exploring the relationship between childhood medical experiences and adulthood perceptions of the medical setting, how CCLS services are and would be received, and the impact of medical experiences on the parent-child relationship. The gaps filled within this study support current literature and provide framework for future studies about the relationship of perceptions of the medical setting and health attitudes.

Patient Perception on the Effect of Instrument Assisted Soft Tissue Mobilization (IASTM)

Author DANA JOHNSON
Mentor MATTHEW DONAHUE

Poster 23, Session 1

Athletic Training and Nutrition

Context: Previous research has shown dorsiflexion range of motion (ROM) is vital to the gait cycle, at least 7 degrees of ankle dorsiflexion is needed to maintain a normal gait, and those with less than 5 degrees of ankle dorsiflexion are at an increase risk for chronic ankle instability. Evidence suggests IASTM can be used to increase ROM immediately post treatment but the persistence of this increase in unknown. Objective: The purpose of this study was to investigate patient perception after a series of IASTM treatments evaluating ankle range of motion in college age and older active adults. I hypothesized that patients will think IASTM treatment will significantly improve dorsiflexion range of motion at the ankle 72 hours after last treatment. Design: Cohort Study Setting: University Research Laboratory Patients or Other Participants: Twenty active individuals with limited dorsiflexion (> 5˚) volunteered for the study. All subjects were active at least 30 minutes (or more) 3 times a week and had no history of ankle instability. A power analysis revealed 16-22 participants will be require to achieve a power of a=0.05. Interventions: A structured 8-minute IASTM treatment was administered to the Achilles tendon of all subjects. Subjects also received a pre-treatment and post-treatment survey. Main Outcome Measures: A survey was designed to examine subjects pain perception before and after the treatment intervention, if they had experienced a similar therapy before and whether or not they thought the treatment worked. Statistical Analysis: A RMANOVA will be used to investigate subject responses from surveys. Alpha level will be set at p.

Varying Ferritin Levels Affects Hemoglobin and Hematocrit Levels of WSU Cross Country Runners

Author BENJAMIN KEATON

Mentor DAVID AGUILAR-ALVAREZ

Poster 22, Session 1

Athletic Training and Nutrition

Purpose We investigated how different levels of ferritin, within normal ranges, may influence hemoglobin production and inflammation markers in cross-country runners. We hypothesize that in this unique population increases of ferritin will be associated with higher hemoglobin levels and a better inflammatory profile. Methodology 41 collegiate distance runners (Male: 19; Female; 22) were recruited to provide blood samples for analysis. Blood was collected from subjects and analyzed by complete blood count (CBC) and a Luminex TM platform. Blood sample markers were further analyzed by gender subgroups and separated by high, medium and low ferritin levels, all within normal ferritin ranges. Correlations between inflammatory markers and CBC were also conducted. Results Significant increases in hemoglobin (p=.02), hematocrit (p=.03) and Interleukin-5 (p=.01) were found among participants in the high ferritin subgroup when compared to low ferritin subgroup. There was also a significant correlation between eosinophil and ferritin levels in male athletes (r=.594). Conclusion Our results suggest that different levels within normal ranges of ferritin may play a role in modulating immune function and influencing hemoglobin production among male collegiate cross-country runners. Therefore, increased ferritin levels even within the normal range may provide overall improved athletic performance.

K-12 Education Mission Fulfillment: Evaluation of DaVinci Academy Parent Perception

Authors TESS KENDALL
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Poster 5, Session 1

Child and Family Studies

The purpose of this project is to partner with the DaVinci Academy of Science and the Arts to evaluate stakeholder perceptions of DaVinci's fulfillment of their mission. Stakeholders include: students, parents, facility, administrators, and the community. The DaVinci Academy of Science and the Arts is a title one school located in Northern Utah. The DaVinci Academy started out as grades 9th-12th in fall of 2004 expanding to include elementary and middle school since that time. The board and administration of the DaVinci Academy came to partner with Weber State University Community Research Team to obtain an evaluation of their mission fulfillment. In this presentation we will share the instruments and results from a survey targeting the parents of current DaVinci students. Thus far, we have agreed with school administration that the mission statement of the DaVinci Academy has three dimensions: 1) Student Outcomes; 2) Learning Environment; and 3) Public/Private Partnership. The intention of the survey is to assess parent perception of whether DaVinci Academy is fulfilling the mission in these three areas. This presentation will focus on data received from current DaVinci parents and a discussion of the process by which this project is moving forward.

Positive Youth Development in Latino Youth Through Outdoor Recreation

Author RAQUEL KRAEMER

Mentor CASS MORGAN

Poster 32, Session 1

Health Promotion and Human Performance

Latino youth face significant challenges when it comes to successfully navigating adolescence. Evidence shows Latino youth engage in more risk behaviors (e.g. drug use, sexual promiscuity) and have the highest rate of high school dropouts among different ethnic groups.(Kuperminc, 2009). However, promising research shows that participating in outdoor recreation activities can be one way to support the development of healthy behaviors in youth that can serve as a protective mechanism against risky behaviors (Sibthorp & Morgan, 2011). Therefore the purpose of this study was to explore the effects of a school-based outdoor recreation program on positive youth development in students enrolled at a predominately Latino high school. Methods: A pre-test/post-test design was used to determine whether any changes in positive youth development occurred by participating in the outdoor recreation program. The sample consisted of 40 students 48% were Hispanic/Latino/Latina (53% female and 48% male). Students completed a 58-item questionnaire (Search Institute, 2004) that assesses youth development across multiple factors (e.g., support, empowerment, social competencies, commitment to learning). Results: Initial analyses revealed significant positive changes in the youth development scores. A complete analysis of the data has not been conducted, but will be completed by the symposium. Conclusion: Pending final results. References

Kuperminc, G. P., Wilkins, N. J., Roche, C., & Alvarez-Jimenez, A. (2009). Risk, resilience, and positive development among Latino youth. Handbook of US Latino psychology: Developmental and community-based perspectives, 213-233. Search Institute. (2015). Strengths and supports in the life of Ogden high school youth. Unpublished manuscript, Weber State University, Ogden, UT. Sibthorp, J., Morgan, C., (2011, Summer). Adventure-based programming: Exemplary youth development practice. Recreation as a Developmental Experience,130, 105-119.

Assessing Barriers to Father Involvement: Evaluation of Ogden-Weber Community Action Partnership Head Start Fatherhood Program

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Poster 27, Session 1

Child and Family Studies

Assessing Barriers to Father Involvement: Evaluation of Ogden-Weber Community Action Partnership Head Start Fatherhood Program Abstract Research shows that fathers have a significant impact on the lives of their children (Brooks, 2008; Gottman, 1997). Children, who have secure relationships with their fathers, have better health, experience higher cognitive functioning, are more confident, and are better prepared to face the world (Allen & Daly, 2007). However, it is hypothesized that fathers and father figures who have children enrolled in Head Start confront unique obstacles, challenges and barriers to full participation in their children's lives. These barriers may be related to economic or educational disadvantage, mental health issues, substance abuse, domestic violence, lack of transportation, or poor relationship with the children's mother (Fagan & Kaufman, 2015). It is important to understand these barriers in order to implement programs to help fathers overcome their challenges in being fully involved with their Head Start children. Ogden-Weber Community Action Partnership (OWCAP) Head Start has requested that students on the Center for Engaged Learning Community Research Team at Weber State University conduct a survey to identify the barriers to participation in their fatherhood program in order to determine if such programs are effective in addressing the barriers and helping fathers to overcome them. Surveys are being distributed through Head Start Family Service Workers during scheduled meetings with fathers. It is hoped that the data from this research will identify barriers that Head Start staff can address through parenting classes, connections to other community resources, and improved programming. The poster presentation will highlight the importance of involved fathering and the results of the research.

Breaking New Ground: A Service Learning Program for an Urban Education Enviornment

Author SUEANN PHILLIPS

Mentor GINA SHELLEY

Oral Presentation

Teacher Education

Rarely has there been a service learning program at the university level that has documented preservice teachers who have volunteered as tutors to work with adults who are recovering drug addicts in the criminal justice system. Project Literacy Instruction to Further Education (Project LIFE) was developed to provide literacy skills and GED tutoring to individuals who are nearing completion in an urban drug court program. Project LIFE has expanded to include participants who are in poverty and in need of tutoring to complete their GED or to assist them in preparing for assessment exams in post-secondary or university programs. The purpose of this mixed-method study was to evaluate an innovative program that is attempting to provide a solution for improving the adult literacy problem in its community. Conclusions showed that the symbiotic relationship between the tutors and participants created a positive learning environment for all; the use of tutors were crucial to the overall success of the program, participants noted a significant increase in their personal reading skills; and the use of both extrinsic and intrinsic rewards were motivational for all participants. All the participants evaluated Project LIFE as being extremely effective at helping them to accomplish their educational goals.

Early Father-Child Rough & Tumble Play and Children's Social and Emotional Outcomes in China

Author LAUKAUPOULI POHAHAU

Mentor WEI QIU

Poster 33, Session 1

Teacher Education

Early father engagement with children in China has been influenced by complex social and historical factors, particularly the one-child-per-couple national policy and the new "missing dad" trend that identified Chinese fathers as far less involved in young children's early life than mothers or grandparents (National Health and Family Planning Commission, 2015). The quality of early father-child rough and tumble play may influence children's social and emotional development while influenced by unique sociocultural factors in China. The purpose of this study was to examine associations between the quality early father-child rough and tumble play (RTP) and children's social and emotional outcomes among Chinese families. The findings suggest that families with working mothers that value mutuality in relationships with children may provide a supportive context for positive early father-child playful engagement. Furthermore, contemporary Chinese fathers seemed to attune RTP interactions to their child's temperament, which may indeed serve to scaffold children's emotional regulation and reduce aggressive behaviors.

Lessons Learned with Community Based Research: Comparing Approaches

Author MARLA ROSENVALL

Mentor PAMELA PAYNE

Poster 31, Session 2

Child and Family Studies

As an undergraduate student on the Center for Community Engaged Leadership Research Team there is the unique opportunity to manage and conduct a research project first hand with a community partner. Through engaging in this type of research there are many lessons to be learned. Working on two projects at the same time has created an even more unique opportunity to compare working with two different sets of team members and two different community partners. The first project is with the Ogden Weber Community Action Partnership (OWCAP). OWCAP services the under privileged population of Ogden and Weber Counties in Utah. They have a fatherhood program that was put into action during the 2015-2016 school year. They requested their program be evaluated for the barriers preventing Head Start fathers from being involved with their Head Start children. The goal is to identify barriers to involvement to impact programmatic offerings. This project is beginning data collection and was started in August 2016. The second project is with DaVinci Academy. A K-12 charter school in Ogden Utah. The goal of this project is to determine if the school is meeting their mission by assessing various stakeholders' perceptions. This project is in its second year and is in the data analysis stage from the first survey which reached out to the parents of current DaVinci students. After meeting with their Board of Directors to present the finding they will decide which stakeholders will be assessed next (e.g., students, community members, faculty, staff). When working with two different community partners the approach is different for each project. This presentation will discuss the different approaches taken on each project and with each community partner and the lessons that have been learned. Discussing these experiences allows for future undergraduate community based research experiences to be improved.

Barriers and Constraints to Recreation: Participation Among Individuals With Disabilities

Author SAV SHOPAY

Mentor CASS MORGAN

Poster 34, Session 1

Health Promotion and Human Performance

The purpose of this study was to identify barriers to recreation participation among individuals with disabilities. In 2016, a survey was sent out to local residents to determine recreation needs. Of the surveys completed, 72 individuals indicated having a disability. Respondents were asked to identify if any barriers existed to participating in recreation programs. Responses were analyzed qualitatively for themes and then enumerated. As seen in table 1, 43% of barriers were intrinsic, 38% environmental and .04% communication.

Table 1

Types of barriers	Examples	Percentage
Intrinsic barriers ● Health problem ● Social ineffectiveness	'Cannot run or walk' 'Severe arthritis, degenerative disc disease' 'Being around a lot of people'	43% (86%) (.06%)
Environmental barriers ● Ecological ● Barrier of omission ● Economic ● Architectural ● Transportation ● Negative behaviors	'Access- poor or uneven surfaces' 'Grass is difficult with walker' 'Don't know about them, website is clunky/difficult to navigate' 'Single mom not in poverty so make too much money and have a hard time getting accepted' 'Not enough sidewalks getting to fields' 'Parking' 'Being bullied, lack of understanding'	38% (20%) (10%) (.05%) (30%) (30%) (.05%)
Communication barriers	'Nonverbal'	.04%
No code	Unable to decipher	15%

These data provide recreation professionals the information to better serve individuals with disabilities and provide accommodations (e.g., adaptive equipment, adaptive programming).

Exploring Frustration with Parents-In-Law Communication

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DARLA SMITH

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Poster 28, Session 1

Child and Family Studies

The importance of the relationships between parents-in-law and children-in-law is established as being influential in other family relationships (e.g., Rittenour, 2012). A major part of these relationships is the communication patterns between in-laws. For example, many familial dyads may contain more demand-withdraws patterns, while others see higher levels of criticism and defensiveness (e.g., Futris, Campbell, Nielsen, & Burwell, 2010; Caughlin & Scott, 2010). Additionally, research has shown that expectations from in-laws, and specifically approval from parents-in-law influence relationship outcomes (e.g., Rittenour, 2009). A sample of 64 respondents answered the following question: If your parent-in-law's communication pattern is bothersome, please describe why you feel that way in two or three sentences. This report is a description of the thematic analysis used to identify central themes from this sample. For example, one theme that emerged was Disapproval. The following quote was one that supported this theme: "She does not approve of me. It is hurtful so I have ended the relationship. My husband & children still have a relationship." Other themes include Demeaning, Controlling, and Avoidant. The presentation will identify and explain these themes in greater detail.

Influence of Lifestyle Habits and LDS Religion on Metabolic Syndrome Parameters in College Students

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HEIDI JENKINS

Mentor DAVIDAGUILAR-ALVAREZ

Poster 30, Session 2

Athletic Training and Nutrition

Objectives Lifestyle restrictions are present in the Church of Jesus Christ of Latter-day Saints (LDS) religion as described in the "Word of Wisdom," which prohibits the "use of wine, strong drinks, tobacco, and hot drinks." With this premise, we sought to determine if the religion influenced metabolic syndrome (MetS) parameters among college students. Additionally, we sought to determine whether other lifestyle factors influenced MetS regardless of religion. Research Methodology We assessed MetS parameters in 160 Weber State University student participants. Additionally, a 16-question survey was utilized to determine religion and lifestyle factors. We separated men and women into subgroups to account for gender influences on MetS parameters. Results Participants who ate out more than 3 times a week presented higher waist circumference, body mass index, and lower high density lipoprotein concentration (HDL-C) than those who ate out less frequently. LDS women presented a favorable MetS profile with lower triglycerides and higher HDL-C. MetS incidence was lower in LDS women (12%) compared to non-LDS women (23%). In men: High meat consumers presented lower HDL-C compared to low meat consumers. Conclusions The LDS religion may influence parameters of MetS in both genders. Among the lifestyle factors measured, eating out seems to have the greatest influence on MetS parameters regardless of gender in this population. The results of this study support the important role that lifestyle habits have on various health markers.

PowerPlay Cryo-Compression Modality's Ability to Decrease Intramuscular and Skin Temperature

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Poster 25, Session 1

Athletic Training and Nutrition

Previous research has found ice bags are more effective at lowering intramuscular temperature than other cryotherapy modalities (e.g., whirlpool, ice cup, slush bucket, gel pack), and that gel packs are a relatively ineffective intramuscular temperature cooling method. Recent studies have evaluated intramuscular temperature cooling decreases of ice bag versus common cryo-compression modalities (i.e., Game Ready); however intramuscular decreases elicited by PowerPlay have not been examined. Our purpose was to evaluate rate and magnitude of cooling using PowerPlay with gel-pack option (PP-gel), PowerPlay with ice bag option (PP-ice), and control (no treatment) on skin and intramuscular temperature (2cm sub-adipose). We hypothesized that PP-ice would result in greater rate and magnitude of intramuscular and skin cooling compared to PP-gel, and that both PP-ice and PP-gel would cool more than control. Our design was a repeated-measures counterbalanced study in a University research laboratory. Our participants were 11 healthy college-aged participants (3 males,8 females) without compromised circulation or injury. Participants underwent each treatment. Temperatures recorded at baseline and every 6 minutes during 30-minute treatment. Our results for intramuscular temperature confirmed our hypotheses, in that PP-ice cooled faster than PP-gel from minutes 24-30, and PP-ice and PP-gel both cooled faster than control from minutes 18-30. For skin cooling, PP-ice cooled faster than control from minutes 6-30, PP-gel cooled faster than control from minutes 12-30. Our conclusion is that PP-ice produces clinically and statistically greater muscle and skin cooling as compared to PP-gel. PP-gel did not cool skin enough to induce skin analgesia (skin temperature of 13.6˚C needed for analgesia) or cool muscle enough to promote desired physiologic effects of cryotherapy. Ice bag should be used instead of gel pack in a clinical setting where cryotherapy is indicated.

Skin Cooling Effects of Whole Body Cryotherapy vs. Cold Water Immersion

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Poster 24, Session 1

Athletic Training and Nutrition

Background: Cold water immersion (CWI) is a common cryotherapy application that has many known and accepted benefits. Whole body cryotherapy (WBC) is a relatively new method that consists of a 3-minute treatment in a Nitrogen gas-filled chamber at temperatures of -160 to -190°C.Objective: To determine the differences in skin temperature cooling between a 20-minute CWI treatment and a 3-minute WBC treatment. We hypothesize that the WBC technique will create greater cooling effects on the skin, and that the cooling will be retained longer after removal. Design: The study used a crossover design. Participant treatment order was randomly determined using a 2 x 2 Latin - Ten healthy participants (2 females, 8 males), ages 18-34 years old, without recent lower extremity injuries. Methods: An IT-21 skin temperature probe, connected to an Isothermex electrometer, was placed at the thigh (over the vastus lateralis). Prior to the cryotherapy treatment, a 5-minute baseline temperature was measured. The participants then received either a 3-minute WBC treatment, or a 20-minute CWI treatment (depending on order). After the treatment, skin temperature was remeasured during a 15-minute rewarming period. Each participant returned within 48-72 hours to receive the opposite cryotherapy treatment, using the same protocol.

Coparenting Abbreviated Online Curriculum

Author SHANALYN WHEELER
Mentor SHEILA ANDERSON

Oral Presentation

Child and Family Studies

Funded by an OUR Undergraduate Research Grant the purpose of this project was to field test the effectiveness of abbreviated online curriculum modules in order to strengthen coparenting relationships using dyadic survey methodology. Coparenting is when two parents work together to help their child develop a healthy outcome. "Positive coparenting relationships enhance parent-child relationships above and beyond other aspects of partner relationships" (Palkovitz, Fagan, & Hull, 2013). The quality of coparenting is "associated with higher levels of father engagement and more secure mother-child attachment"(Pudasainee-Kapri and Razza, 2015). Two predominant challenges facing relationship education programs include recruitment and retention of participants (e.g., Skogrand et al., 2010). To address these challenges Hawkins (2015) suggested using brief online prevention-focused programs that teach one or two specialized skills/outcomes. Using a pre/post-test study design three online educational models were field-tested with parents of two to seven-year-old children. The project currently has a sample size of 121 participants, and is currently collecting more data. While the project is still active, qualitative questions provide by participants suggest a positive reaction to the program.

COLLEGE OF ENGINEERING, APPLIED SCIENCE & TECHNOLOGY

Solar Flight

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Mentors DUSTIN BIRCH

Poster 4 , Session 2

Mechanical Engineering Technology

The goal of Solar Flight is to design and build a solar enhanced, quad-copter drone. With the growing popularity of both drones and solar power, team Solar Flight is aiming to bring these two technologies together to produce a drone that will contend with current record flight times. Through the choice of materials and a custom design, we have streamlined the drone to be weight efficient and also be capable of supporting a solar array that will augment the battery supply. Extensive research, development, and adjustment has gone into this project by advising with experts in the field, making calculations, running simulations, and collaborating together as engineering students. We hope this drone will also provide Weber State University with a recruiting tool that may interest prospective students to learn more about engineering and science.

Low-Cost and Open-Source Water Quality Sensor Network

Authors JASON BURROW
DAKODA LINDSAY
LONNIE MARTINEZ

Mentors SUKETU NAIK

Poster 1, Session 2

Electrical and Computer Engineering

Water quality and availability has long been an issue in the Western United States. Drought, pollution, and climate change are threatening our access to fresh water. We are developing an in-situ sensor system that can measure water quality parameters at several remote locations and upload the data wirelessly to the internet. Automated data uploads reduce the labor required to monitor Utah's lakes and streams. Solar panels and rechargeable batteries allow the sensor stations to collect data in inaccessible locations. Testing the water each hour will improve our insight into daily, seasonal, and annual changes in water chemistry. Open access data repositories will allow additional researchers to utilize the data in their own studies. Open source hardware and software enable interested parties to quickly replicate the entire system. The system will initially be deployed at Fish Lake in central Utah, while future monitoring sites will likely target the Ogden and Weber Rivers.

DriftMoto Snowbike

Authors WILEY COLLIER
AARON CHAPMAN
JOSH HARDIN
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DAVE JOHNSTON

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MARK BAUGH

Poster 6, Session 2

MFET

DriftMoto Chrome-Moly Tubing Welding Research The purpose of this research was to determine the best welding process and filler metal combination that will result in the best welding solution for high production manufacturing while still maintaining the strength performance of 4130 Chrome-Moly tubing. The final results of the project will be tested in a real world application of the motorsports industry in the form of Snowbike conversion kit. To determine the best welding process and filler metal combination we will be fabricating samples with two different welding processes and three different filler metals. A heat input to hardness graph comparison will be done between the two processes. The resulting samples will be tested for Fatigue life, tensile strength and heat input compared to hardness. The Results will allow us to select a process and filler metal combination the will result in the most efficient method for joining 4130 Chrome-Moly.

Industrial Viability of Nickel Plated Resin Molds

Authors CODY GRIMMETT
BRAULIO AYALA
RYAN JONES

Mentor ANDREW DECUESTER

Poster 5, Session 2

Mechanical Engineering Technology

Industrial Viability of Nickel Plated Resin Molds Injection molding is a cost effective way to manufacture thousands of duplicate parts very rapidly. 3D printing is a rapid prototyping process that allows the creation of objects at a fraction of the cost and time. Our research project the combination of the two in the form of nickel plated resin molds. Our objective is to determine the longevity of this style of mold to decide if it feasible for industrial use on low production items. In order to determine this we will inject our mold until failure occurs. Failure is determined by one of two incidences. The first is the appearance of a severe fracture in the nickel plating, and the second is when the mold consistently produces parts out of tolerance from their dimensions. From enough molds we will be able to determine the average life of a mold and the price per part. If this price is satisfactorily low then the process is fit for industry, if it is too high we will have to determine what if any uses it might have.

Bluetooth Enabled LED Matrix Display

Authors MATTHEW HANSEN

Mentor FRED CHIOU

Oral Presentation

Electronics Engineering Technology

The aim of the Bluetooth Enabled LED Matrix Display project was to create a product that would help attract students to the Weber State Engineering Technology Department. Students are able to connect with their smartphone via a wireless Bluetooth link to the display, and stream their own text. The project is meant to demonstrate many aspects of Engineering Technology, such as Electronics Engineering and Industrial Design Engineering. This system is composed of two custom circuit boards, one with 144 LEDs, the other includes a custom circuit for controlling and driving the LEDs. A Bluetooth module allows the device to connect wirelessly to a smartphone, and receive text data that will then be scrolled across the display. These boards sit in a thin enclosure, with both front and back removable to show the circuits. With potential students able to send messages to the display using their own device, they can get involved in the technology, and hopefully become interested in STEM education and the Weber State Engineering Technology Department.

Water Flow Sensor Research Project

Author MATT MOSES
CHRIS RIET

Mentor CHRISTOPHER TRAMPEL

Poster 2, Session 2

Engineering

The project question that we would like to answer is, "What are the advantages and disadvantages of new methods used to detect and measure water flow in a shower?" The purpose of this research project is to identify potential technologies that can be used to detect and measure water flow from a shower. This information can be used to help end users be aware of the amount of fresh water and energy that they use on a daily basis. This feedback to the user can influence their behavior to reduce the amount of time in the shower which will lead to less energy use and less water consumed. The goals of this project are to develop water flow test benches, minimize the detection circuit power usage, and ensure reliable water flow data. A prototype design will be created into test benches of each type of flow detection technology. There are a number of ways to detect water flow. This project will be to design and realize several methods of detecting water flow. The sensor methods we will use include ultrasonic, acoustic, and capacitive.

APSUI

Authors CODY O'BRIEN
MAN DINH
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Mentor FON BROWN

Poster 3, Session 2

Engineering

Project APSUI created an alternative power supply and user-interface for Team HARBOR. This project empowers Team HARBOR with the ability to almost immediately see and work with data on the AtmoSniffer both pre- and post-flight. The alternative power supply powers the AtmoSniffer to ensure all sensors are sufficiently calibrated.

Predicting Room Occupancy from Encrypted Sensor Data

Author WESLEY SMITH

Mentor KYLE FEUZ

Poster 12, Session 2

Computer Science

This study is to determine how machine learning can be used to determine whether or not there is activity in an area monitored by a wireless Zigbee network of motion detectors. We are interested in how precise the predictions are when the block of time being predicted varies in length. With a Packet Sniffer we capture packets being sent between nodes in the Zigbee network and simultaneously observe activity in the area. All of the communication between motion detectors is encrypted but the encrypted packets can still be analyzed for patterns. By looking at the packets of information that are sent between nodes of the Zigbee network the algorithm predicts whether a room is currently occupied/active. We then compare our predictions to the observed activity and assess the quality of our predictions. Our results indicate that despite encryption being used we are still able to accurately predict the occupied state of a room over different time periods.

DR. EZEKIEL R. DUMKE COLLEGE OF HEALTH PROFESSIONS

Expression of SLC6A3 Gene in Persistent ADHD

Authors RYAN ANDERSON
DAVE MERKLEY
LUCAS WADDOUPS
Mentor MATT NICHOLAOU

Poster 20, Session 1

Medical Laboratory Science

Attention Deficit Hyperactivity Disorder (ADHD) is a common neuropsychiatric disorder that begins in early childhood. Currently, ADHD is diagnosed using survey-based criteria of which have been argued as arbitrary and vague. This has, lead to misdiagnosis and unwarranted over prescriptions of associated medications. We surmise that a mutation in the SLC6A3 gene is responsible for persistent ADHD in adults. The SLC6A3 gene, also known as the dopamine transporter gene, codes for a protein that aids in the transmission of dopamine and prevents excessive re-uptake. There is evidence that polymorphisms in SLC6A3 (dopamine transporter gene) is associated with ADHD. Genetic analyzes will be performed to evaluate for the presence of the gene mutation in SLC6A3, as well as how the mutation effects mRNA production. Based on DSM-V criteria, a survey will be distributed among individuals. Those who meet the criteria as being healthy will be the "control group" and those that meet criteria for ADHD will be the test group. Genomic analysis of both groups will be carried out using real time PCR. Doing so will allow us to examine the association between the SLC6A3 mutation and ADHD as well as its effect on mRNA.

Genomic Analysis of SLC6A3 Expression in Persistent ADHD

Authors RYAN ANDERSON
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Poster 21, Session 1

Medical Laboratory Science

Attention Deficit Hyperactivity Disorder (ADHD) is a common neuropsychiatric disorder that begins in early childhood. Currently, ADHD is diagnosed using survey-based criteria of which have been argued to be arbitrary and vague. This has led to misdiagnosis and unwarranted over prescriptions of associated medications. We surmise that a mutation in the SLC6A3 gene is responsible for persistent ADHD in adults. The SLC6A3 gene, also known as the dopamine transporter gene, codes for a protein that aids in the transmission of dopamine and prevents excessive re-uptake. There is evidence that the presence of polymorphisms in SLC6A3 (dopamine transporter gene) is associated with ADHD. Genetic analyzes will be performed to evaluate for the presence of the gene mutation in SLC6A3, as well as how the mutation effects mRNA production. Based on DSM-V criteria, a survey will be distributed among individuals. Those who meet the criteria as being healthy will be the "control group" and those that meet criteria for ADHD will be the test group. Genomic analysis of both groups will be carried out using real time PCR. Doing so will allow us to examine the association between the SLC6A3 mutation and ADHD as well as its effect on mRNA expression.

Effects of 5-FU on Bifidobacteria sp, Lactobacillus sp, Bacteroides sp, and Escherichia sp in Vitro

Authors ADRIENNE CARLSON
ASHLEY HODGES
LUCAS WADDOUPS
Mentor MATT NICHOLAOU

Oral Presentation

Medical Laboratory Science

Chemotherapy has been shown to disrupt intestinal bacterial populations that can lead to complications such as diarrhea, bacteremia, and septicemia. This research seeks to determine the effect of the common chemotherapeutic agent, 5-flurouracil (5-FU), on the survival rate of the normal intestinal organisms Bifidobacteria sp, Lactobacillus sp, Bacteroides sp, and Escherichia coli in vitro. After the application of 5-FU doses that far exceeded levels found in the human intestine following chemotherapeutic treatment, growth inhibition was not observed in any of the bacterial species tested. In most patients who receive 5-FU as a chemotherapeutic treatment for cancer, doses are given over the course of multiple days. To replicate this process, the experimental intestinal organisms will be cultured with 5-FU for multiple days to determine if prolonged exposure to 5-FU will affect the growth rate. 5-FU will kill or inhibit the growth of the normal intestinal organisms. The result will determine if 5-FU directly impacts the test organisms, or if other factors are the cause of their decrease during chemotherapy treatments.

Adult Caries Risk Assessment Practices and Fluoride Varnish Use Among Dental Hygienists

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Poster 17, Session 2

Dental Hygiene

Adult Caries Risk Assessment Practices and Fluoride Varnish Use Among Dental Hygienists McKenzie Flint, Maria Comeau, Jennifer Gilivary, Jennifer Kavon, and Kili Burch Frances McConaughy, MS, RDH Dental caries is the most chronic oral disease affecting children and it also affects adults. Fluoride varnish is the gold standard for caries prevention and the American Dental Association has released risk assessment guidelines for the use of fluoride varnish for both children and adults. Varnish is now widely recognized for caries prevention in both primary and permanent dentitions. However, little is known about fluoride varnish use among dental professionals and the use of formal or informal caries risk assessments, especially among adults. Therefore, the purpose of this project was to examine adult caries risk assessment practices, the reported frequency of professionally applied fluoride varnishes, and patient acceptance of varnish in a clinical setting. A cross-sectional survey research design was used in this study to collect information about caries risk assessment and fluoride varnish. Respondents included licensed dental hygienists in the State of Utah. We anticipate that professionally applied fluoride varnish is not used frequently for adults and this may be related to limited use of a formal caries risk assessment.

Ultrasonic Instrumentation- Time Used and Tip Wear

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Poster 18, Session 1

Dental Hygiene

Ultrasonic scaling has been identified as a salient therapeutic treatment for periodontal disease. Further, ultrasonic scaling offers distinct advantages in comparison to other therapeutic approaches. However, little is known about the actual practices of dental hygienists when using ultrasonic therapy for periodontal patients. The purpose of this research project was to ascertain the length of time ultrasonic therapy is used for periodontal patients and obtain information about the strategies dental hygienists use in monitoring ultrasonic tip wear. Using a survey research design, practicing dental hygienists from the State of Utah were asked to complete an online questionnaire designed to obtain this information. It is anticipated that the results will contribute to the literature on ultrasonic therapeutic practices of dental hygienists.

Using CRISPR/CAS-9 with Electroporation to Kill Extended Spectrum BETA Lactamase Organisms

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Oral Presentation

Medical Laboratory Sciences

Antimicrobial therapies have seen a decrease in effectiveness as microorganisms have developed resistance to them. Creating methods to combat pathogens is an increasing area of research, as virulent strains have become more resistant to traditional treatments. Through CRISPR (clustered regularly interspaced short palindromic repeats) gene editing technology, it is possible to create sequence-specific targeting mechanisms for virulence genes. The specific gene that will be targeted is known as bla-SHV-18, and causes strong resistance towards a variety of beta-lactam agents. Organisms with this type of resistance are known as Extended Spectrum Beta-lactamase (ESBL) producers. The bla-SHV-18 gene for Klebsiella pneumoniae ATCC 700603, will be targeted with a plasmid which contains a CRISPR/cas9 system that will target the gene sequences responsible for penicillin resistance and splice them. This should result in decreased growth of Klebsiella pneumoniae colonies as well as an increased susceptibility to drugs that were previously ineffective. The CRISPR/cas9 plasmid will also contain a resistance gene to another antimicrobial. Successful integration of the plasmid will be shown by the organism gaining resistance to a previously effective antimicrobial. To measure the effect of the CRISPR system, culture growth will be measured as well as antimicrobial resistance tests. PCR will be used to verify the removal of Beta-Lactamase sequences in the DNA. This study will open doors in further areas of research in CRISPR/cas9 therapy as well as possible treatments for antibiotic resistance bacteria.

Ultrasonic Tip Selection Practices of Dental Hygienists

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Poster 14, Session 1

Dental Hygiene

Makelle Marsde, Nicole Allen, Amanda Musselman, Adolfo Bravo, Veronica Morales Faculty: Frances McConaughy, MS, RDH, Susan Alexander, Med, RDH Ultrasonic instrumentation has been the leading choice in periodontal instrumentation since the 1990's (Silva, et al., 2012). However, little is known about the actual ultrasonic tip selection practices of clinical dental hygienists. The purpose of this project was to understand the strategies and variety of ultrasonic tip selection used by dental hygienists in treating patients with periodontal disease. A survey research design was used in this study to collect information online from licensed dental hygienists in the State of Utah. It is anticipated that in spite of a diversity of ultrasonic tips for treating periodontal disease, dental hygienists limit the number of ultrasonic tips used in the therapeutic process.

Linking Diabetes and Depression Through BDNF and Myeloperoxidase

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Oral Presentation

Medical Laboratory Sciences

Diabetes-induced depression has become an important point of research as a difference between the rate of depression in diabetics and "healthy" people has become apparent. The point of concern is the idea that diabetics may a physiological difference that makes them more susceptible to depression. Two biomarkers that have been found to be consistent with depression and diabetes in separate studies are Brain Derived Neurotrophic Factor (BDNF) and Myeloperoxidase (MPO). These will be tested for in participants through two groups, which will consist of a "non-depressed" group and a depressed group according to their responses to the questions of the Beck Depression Inventory Questionnaire (BDIQ), scores depression. Between both groups, diabetic participants (with an A1C >6.5%) will be dispersed into either group depending on their BDIQ answers. These two groups will be compared for any correlation between the values of BDNF, MPO, A1C, and BDIQ. BDNF and MPO will also be measured through participant's blood samples to look for physiological signs of depression, which may or may not be correlated to the severity of diabetes. This research strives to find a correlation between these two diseases, which may lead to advances in treatment of both diabetics and those with depression.

Diabetes Risk Assessment in Dental Hygiene Education

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Poster 15, Session 1

Dental Hygiene

Diabetes is a well-known risk factor for periodontal disease and when poorly controlled, can complicate periodontal treatment. At the same time, periodontal disease is a common chronic inflammatory condition that impacts diabetic health. The purpose of this project is to assess the ease of implementation of the American Diabetes Association (ADA) written risk assessment for diabetes and a chairside HbA1c test (Point of Care) in a Dental Hygiene educational setting. Further, this project will examine the relationship between the results of the diabetes risk assessments and periodontal disease status. It is expected that students and faculty will confirm the ease of implementation of a diabetes risk assessment and administration of an HbA1c test. It is also hypothesized that there will be a positive correlation between the results of the diabetes risk assessments and patients' periodontal disease status. It is anticipated these findings will support the role of dental hygienists in coordinating oral and systemic health care.

Sealant Retention: An Evaluation of School-Based Sealant Programs

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Poster 19, Session 1

Dental Hygiene

Dental (enamel) sealants have been recognized as an effective method to prevent pit and fissure caries in children (Beauchamp, 2008). While dental sealants have traditionally been placed in private practice settings by dental hygienists, not all children and adolescents have access to preventive dental care in that setting. The advent of School-Based Sealant Programs (SBSP) involving faculty and students in Dental Hygiene Programs, have also shown to be effective in providing this preventive care to children. Therefore, the purpose of the sealant retention study was to evaluate the effectiveness of the sealant program at Weber State University Dental Hygiene Clinic from the 2015-2016 academic year. Dental Hygiene students used a mirror, light, and explorer to visually and mechanically inspect the sealant for retention. Each sealant was recorded as either fully retained, partially retained, missing/failed according to the rubric as indicated on a data collection sheet. Participants included 6-12 year old children who have previously had sealants placed at Weber State University. It is expected that that Weber State's School-Based Sealant Program will have a high retention rate.

Quorum-Sensing Inhibtion by Various Stilbenoids in Echerichia Coli O157:H7

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Oral Presentation

MEDICAL LABORATORY SCIENCES

Quorum sensing is a bacterial communication system that controls the expression of genes in response to population density. This expression can lead to increased pathogenicity in humans or adherence to treatment vats in the pasteurization process, making quorum sensing a target for the development of new antimicrobial compounds. This study's goal is to determine and compare the ability of stilbenoids to inhibit quorum sensing, biofilm formation, swarming motility and toxin production in Escherichia coli O157:H7. MIC panels with varying concentrations of the stilbenoid compounds will be used to derive a sub-inhibitory dose for testing. Quorum sensing inhibition activity of stilbenoids will be tested using a plate assay and Chromobacterium violaceum CV026 as the bio-indicator strain. Swarming motility will be determined on swarming agar plates with and without the stilbenoid compounds. Biofilm formation will be measured by staining adhered cells grown with and without stilbenoid compounds with crystal violet. Toxin production will be measured using real time PCR. ANOVA and t-Test will be used for statistical analysis. The stilbenoids will inhibit the quorum sensing cascade causing decreased biofilm formation, swarming motility, and toxin production. This could potentially lead to the development of new routes of treatment for E. coli O157:H7.

Flu Vaccine Beliefs and Practices Among Dental Hygienists

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Poster 16, Session 1

Dental Hygiene

Flu vaccinations for healthcare workers have been recommended because of their contact with patients or infective materials from patients. Further, some medical personnel have advocated that some vaccinations, including the flu vaccine, be mandatory. While research has shown the number of some healthcare workers who received the flu vaccine, dental personnel were not included. The purpose of this project was to obtain information about the beliefs and practices of dental hygienists regarding flu vaccination. A survey research design was used to obtain this information from licensed dental hygienists in the State of Utah. It is expected that the results will show that the majority of the respondents believe an annual flu vaccination is warranted for dental healthcare workers. However, we also expect that less than half of the respondents actually receive the flu vaccination annually.

Dental Hygienists and Integrated Oral Health Care

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Oral Presentation

Dental Hygiene

Recent trends in health care suggest oral and general health care should be coordinated over the life of the individual. Dental Hygienists are increasingly viewed as an important provider in inter-professional practice (medical and dental) as they are situated to provide chronic disease screenings and risk reduction activities. Using a survey research design, the purpose of this project is to ascertain the type and extent of risk assessment practices that dental hygienists conduct in assessing chronic diseases as well as barriers/limitations to practicing integrated oral health care. Additionally, this project will explore the bidirectional referral practices (medical/dental) that dental hygienists are involved with. It is anticipated that multiple barriers prevent dental hygienists from providing coordinated care for individuals, especially those with chronic diseases.

COLLEGE OF SCIENCE

Microstructure and Optical Properties of Perovskite Solar Materials

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Oral Presentation

Physics

Microstructure and Optical Properties of Perovskite Solar Cells Traditional silicon solar cells are costly and require much energy to refine the Silicon. A developing alternative technology which shows great promise are perovskite solar cells; the active layer being made of CH3NH3PbI3. We created perovskite samples using a spin-coating technique. After the samples were created, they were examined under an SEM to verify that they had a homogeneous amorphous structure. The sample thickness was determined using an AFM and an ellipsometer. A UV-Vis setup was also built using a monochromator, a series of lenses, and a detector in order to test the bandgap of the samples. By varying our material deposition techniques, we were able to create an amorphous homogeneous sample with a bandgap of about 1.9 eV, which closely matches the solar spectrum. We then included a titanium dioxide layer and made a working cell. We will discuss our perovskite development at WSU.

Isolation and Identification of Pigment Producing Microorganisms from Timpanogos Cave

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Poster 15, Session 2

Microbiology

Microorganisms found in caves are not only diverse, but survive in unique environments with low organic content and abundant mineral sources. Organisms isolated from Mount Timpanogos Cave had not been described in the scientific community thus far. A pink substance was observed on Mt. Timpanogos Cave walls in the 1990s, since then cave employees believe the substance has been spreading. The goal of this project was to isolate a collection of pigmented microorganisms from the cave using traditional and molecular microbiological methods and describe these organisms. The outcomes of this research project will expand scientific knowledge and equip those who maintain Mt. Timpanogos Cave with information that may lead to better preservation of the cave. Pigment—producing microorganisms were isolated, and DNA was extracted from the organisms and sent to be sequenced and identified. The colony morphology has been described and compound light microscopy has been performed. This research project consists of two additional objectives: (1) Characterize isolates based on their thermal tolerances, growth under different lighting conditions, and pigment properties. (2) Test for bacteriophage that may infect and hinder the growth of these organisms.

Generation of Polyclonal Rabbit Antisera Against Zika Virus NS4A and NS4B Proteins

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Oral Presentation

Microbiology

Zika virus (ZIKV), an emerging zoonotic pathogen, has caused a major outbreak in South America, Central America, and the Caribbean and potentially threatening the rest of the world. ZIKV is now considered a pandemic in progress. Taxonomically, ZIKV is a member of the genus Flavivirus in the family Flaviviridae. ZIKV possesses a single-stranded positive-sense RNA genome, which encodes a 3,423-amino acid (aa) polyprotein predicted to be cleaved into 10 proteins: 122-aa C, 168-aa prM, 504-aa E, 352-aa NS1, 226-aa NS2A, 130-aa NS2B, 617-aa NS3, 150-aa NS4A, 251-aa NS4B, and 903-aa NS5. In this work, we aimed to generate a pair of rabbit antisera capable of recognizing the two viral nonstructural proteins NS4A and NS4B. These two proteins are essential for the formation of the viral replication complex derived from the endoplasmic reticulum membranes. To raise the antisera, two rabbits were immunized with each of the bacterially expressed glutathione S-transferase fusion proteins containing a hydrophilic portion of ZIKV NS4A and NS4B. Using these antisera, we will perform a combination of immunoblot and confocal microscopic analyses to assess their reactivity in ZIKV-infected cells. This study will provide two polyclonal antisera, each capable of recognizing ZIKV NS4A and NS4B, which help us elucidate the molecular and genetic basis of viral gene expression.

Determining Kinetic Data for the APEH and ACY Pathway

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Poster 10, Session 2

Chemistry

Metabolism is critical for proper the growth and function of cells. Cells contain numerous metabolic pathways all with unique functions. Malfunctioning metabolic pathways have been implicated in numerous disease processes. This study examines one such metabolic pathway. The APEH/ACY pathway, named for the two enzymes involved, is part of cellular catabolism. It functions to break down small proteins into their constituent amino acids. These building blocks can then be used to make an extensive array of protein products that are necessary to the proper growth and function of the cell. The mechanism of this process is well understood and has been extensively studied, however, much less is known about its overall kinetics. The goal of this study is to determine the kinetics of the APEH/ACY pathway while at the same time developing a new method for determining enzyme kinetics. This new method will lead to better understanding the link between the malfunctioning APEH/ACY pathway and the various diseased states it is implicated in.

Downregulation of Glutathione S-transferase May Play a Role in Dietary Specialization

Author ZACHARY GEE

Mentors MICHELE SKOPEC
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Poster 29, Session 2

Zoology

Juniper foliage is a major component in the diet of some woodrats, even though it contains high levels of potentially toxic terpenes. In order to biotransform the terpenes in their diets, juniper specialists must utilize efficient metabolic pathways. Nitrogen is often a limiting factor for herbivores because plants have low levels of nitrogen and because nitrogen is lost in urine and feces. Thus it is important for herbivores to rely on biotransformation mechanisms that spare nitrogen. We analyzed liver samples from multiple populations of woodrats (genus Neotoma) that were either juniper specialists (N. stephensi and N. lepida from the Great Basin Desert) or not (N. albigula, a dietary generalist, and N. lepida from the Mojave Desert, a creosote specialist). This comparison allowed us to determine how strongly juniper specialists rely on the biotransformation enzyme glutathione S-transferase (GST). GST is an expensive phase II biotransformation enzyme because the conjugate contains three amino acids. We used the liver cytosolic fractions to measure variations in GST activity levels through absorption spectroscopy. While on juniper diets, both juniper specialists down-regulated their GST activity, while both non-juniper feeding species upregulated their GST activity. The down-regulation of GST by juniper specialists likely conserves nitrogen, which is scarce in the juniper foliage. Utilizing nitrogen sparing biotransformation pathways may represent an integral step in woodrats' adaptation to diets low in nitrogen and high in terpenes.

Oxidative Stress on Brine Shrimp

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Mentor NICOLE BERTHELEMY

Poster 21, Session 2

Microbiology

The brine shrimp Artemia, inhabit the Great Salt Lake, a harsh environment where exposure to various stresses, including oxidative stress, is common. The enzymatic pathways enabling to cope with oxidative stress are universal. Some of those enzymes are catalase (CAT), superoxide dismutase (SOD) and glutathione peroxidase (GLU PER). We hope to measure these enzymes within Artemia to better understand how this species handles this type of stress. We have exposed Artemia to 0, 0.5, 1, 2, 5 and 10 ml of hydrogen peroxide (H2O2) per 100 ml sea-water over the span of seven days. Mortality was 100% in shrimp exposed to 10 m/100ml H2O2 for 24 h, to 5 ml/100ml for 48 h. The survival rate was 100% only in the shrimp exposed to 1 ml/100 ml H2O2or less for seven days. Shrimp tissue samples, prepared from the above exposures, were tested for CAT, SOD and GLU PER. Spectrophotometric assay for CAT did not indicate any difference in activity between the samples. Bands obtained after polyacrylamide electrophoresis followed by enzymatic staining did not show any difference for SOD. However, a nonspecific peroxidase (PER) shows a trend in increased activity and might provide a base for further study.

Anti-Cancer Activity of Iron-Based Compounds

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Mentor TIMOTHY HERZOG

Poster 8, Session 2

Chemistry

The purpose of our research project is to synthesize anti-cancer compounds. We have identified three targets that contain iron that are similar to the literature compounds but with some key structural differences. Our goal is to synthesize these three targets in the lab and test their anticancer activity in order to better understand the characteristics of effective cancer therapies and to hopefully develop new therapeutic drugs.

Effect of Bio-protective Lactic Acid Bacteria Cultures on Lactobacillus Wasatchensis

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Poster 22, Session 2

Microbiology

A new nonstarter lactic acid bacteria (NSLAB) cheese, Lactobacillus wasatchensis, appears to be the cause of late gassy defect in aging cheese. Incorporation of bio-protective lactic acid bacteria (BP-LAB) into cheese during manufacture could inhibit its growth. Inhibition between BP-LAB and Lb. wasatchensis was done using the spot test with the agar flip method. MRS agar with 1.5% ribose (MRS-R) was inoculated with each BP-LAB and incubated anaerobically at 25˚C for 48 h or 72 h. The agar was flipped over and Lb. wasatchensis WDC04 or CGL04 swabbed on the exposed surface with the plate incubated anaerobically at 25˚C for 72 h. At 48 h, BP-LAB did not produce significantly greater inhibition zones then other LAB cultures since Lb. brevis, Lb. fermentum LF7469, and P200 all had similar zones. At 72 h, P200 showed the largest inhibition zones for both the Lb. wasatchensis WDC04 and CGL04. To test for bacteriocin production by the BP-LAB, a paper disc assay test was performed. Results confirmed BP-LAB cultures were producing a bacteriocin. Examining the antagonism of BP-LAB and NSLABs against Lb. wasatchensis strains allows for selection of BP-LAB that could inhibit this problematic bacterium during cheese ripening.

Atmospheric Dynamics and The Transport and Evolution of Ozone During Winter Inversions

Author RYAN LAWTON

Mentors JOHN SOHL
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Poster 25, Session 2

Physics

Dangerous levels of pollution in Northern Utah during winter inversions are a public health crisis that requires immediate action to fix. To effectively deal with the problem, we need to have an understanding of how and why it is happening. Our goal at HARBOR is to gain a better understanding of local atmospheric dynamics in order to paint a more complete picture of Utah's air pollution issues. To accomplish this, we used a tethered balloon system to measure the location in time and space of select pollutants in a 150 meter vertical column of air. The evolution and distribution of ozone during a winter inversion was measured over the course of 82 flights during six days including sunrise, mid-afternoon, and sunset. It was discovered that ozone, which forms via a photochemical reaction, develops at higher altitudes first then evolves downward. By mid-day the air column is uniform and stable. At sunset the normal diurnal pattern of evening ozone dissipation shows no consistent spatial dependence. This work is part of a large-scale NOAA measurement campaign called the Utah Winter Fine Particulate Study 2017 that provides a larger data set. The results are discussed in that context.

Effects of Heavy Metal Exposure on a Drosophila Alzheimer's Disease Model

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Poster 11, Session 2

Chemistry

A key observation and pathogenesis of Alzheimer's Disease (AD) is the aggregation of toxic Aß peptides in extracellular amyloid plaques. The toxic Aß peptides contain a metal-binding site to which zinc (Zn) or copper (Cu) may bind. It has been found that Cu, Zn, and iron (Fe) are concentrated around amyloid plaques (Lovell et al., 1998). Further evidence has revealed that Cu, Zn, Fe, and aluminum (Al) may influence the aggregation of Aß peptides (Zatta et al. 2009). In addition, the levels of Cu and Fe increase with age (Maynard et al., 2005) as do the levels of Zn (Bjorklund et al., 2012) and Al (Kawahara & Kato-Negishi, 2011) in AD brains. Using a published fruit fly model that can emulate an aging AD organism with gradual accrual of Aß peptides (Mhatre et al., 2014), the effects on memory after exposure to the aforementioned metals will be tested. Memory will be assayed using the conditioned courtship and climbing assays. Data collection is ongoing and the data are expected to show a worse performance on the memory assays for fruit flies exposed to heavy metals.

Microbial Analysis of Art Byproduct Waste Streams

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Poster 17, Session 2

Microbiology

Oil and acrylic art painting generates waste products related to solvents and paints used in the creative process. The initial phase of this research was aimed at finding and characterizing microorganisms from these art byproduct waste-streams. The goal is to find microorganisms that could possibly speed up the process of biodegrading these materials, which are often resistant to breakdown. Samples were taken from the art waste collection cans in the art studios including what appeared to be biofilms on the storage containers, as well as sludge samples and individual solvents. Minimal media containing three separate solvents was inoculated with samples from the waste stream containers and incubated on a shaker for up to 4 weeks. Biofilms formed in some of the containers during prolonged incubation. Nine individual bacterial cultures were isolated, including 4 Gram-positive rods, and Gram-negative rods and cocci. Taxonomic analysis of isolates is underway. Individual bacterial isolates are being incubated with varying concentrations of specific art solvents to determine their biodegradation capacity. We have found and isolated microorganisms that have the potential to biodegrade art waste while it is in the collection and storage containers.

Caching and Activity in Woodrats (Neotoma sp.)

Author JENNIFER NICHOLS
Mentor MICHELE SKOPEC

Poster 26, Session 2

Zoology

Woodrats (genus Neotoma), also commonly known as packrats, exhibit an interesting behavior of collecting and hoarding objects. These objects do not just include food and items for protection but items that seem to serve no function, such as shiny objects. While previous research indicates that different species of Neotoma vary in amounts of food and non-food items they cache little is known about activities role in this caching behavior. Activity or exercise and its influence on caching behavior was studied in a laboratory setting involving three different populations. The three populations studied included Neotoma albigula, and two populations of Neotoma lepida one from Lytle Ranch, Utah and the other from White Rocks, Utah. To test for differences in caching behavior in relation to activity, woodrats were placed in nesting cages that connected to a secondary area where they had access to a running wheel, rabbit chow (food), and jingle bells (non-food). Trials were run to test if different populations of woodrats altered their caching behavior based on the distance they ran. It was found that both populations of Neotoma lepida handled more bells than Neotoma albigula showing this species may have more of a drive to collect and cache non-essential items. On the other hand, Neotoma albigula cached more food than both populations of N. lepida, showing a greater drive to collect more essential items. In terms of activity level both N. lepida populations ran more on the wheel than N. albigula. Overall, access to the running wheels decreased caching of both bells and food in all woodrat populations demonstrating that having access to an energy outlet (running wheel) decreased caching behavior. Results may show that caching of non-essential items such as jingle bells may serve as an outlet for excess energy in woodrats.

Abiotic vs Biotic Influences on Microbialite Formations in the Great Salt Lake

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Mentor CARIE FRANTZ

Poster 19, Session 2

Microbiology

Microbialites are sedimentary rock structures built by microbial communities that can include cyanobacteria, algae, and heterotrophic organisms. The Great Salt Lake (GSL) is one of only a few modern lake environments where microbialites are thought to be actively forming. However, the processes responsible for the GSL microbialites are poorly understood. Are the microbial communities that dominate the surface and interior of the GSL microbialites capable of facilitating carbonate precipitation in modern lake water conditions? This experiment seeks to test the limits of biogenic vs. abiogenic carbonate precipitation in the GSL by exposing different microbial cultivars enriched from GSL microbialites as well as abiotic controls to different carbonate saturation and salinity levels. Preliminary results suggest that the presence of live GSL microbialite surface communities facilitates rapid carbonate precipitation compared to abiotic controls. Work is ongoing, however, we are also analyzing the influence of microorganisms native to the GSL on the form of minerals precipitated under near-saturation conditions and their similarity to the mineral makeup of the GSL microbialites.

Utah Winter Inversion Optical Air Quality Study

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Poster 24, Session 2

Physics

Using images to determine turbidity levels of the atmosphere is a relatively new, however effective process. Northern Utah faces an atmospheric pollution problem for which we lack a comprehensive understanding. This study will focus on the analyses of digital images to determine a turbidity value for the air over Weber County. The data are collected via two camera systems. A flight camera system, lifted by a low-altitude balloon, collects images to determine the evolution of atmospheric turbidity by both altitude and limited intervals in time. A second system, a stationary "all-sky" camera, takes images for several days in succession yielding a look at the evolution of atmospheric turbidity over an extended period. The pictures taken south of the downtown Ogden area will be analyzed by comparing the optical resolution of selected targets with known air quality measurements, to determine atmospheric turbidity through imagery. This study is part of the "Utah Winter Fine Particulate Study 2017" conducted by a joint team of government agencies and universities. This larger scale project produces standalone particulate data progressing both in time and altitude. This detailed pollution database will be used as a calibration standard for the data analyzed through images.

Characterization of Strains of Lactic Acid Bacteria Isolated From Over the Counter Probiotic Produce

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Mentor KAREN NAKAOKA

Poster 18, Session 2

Microbiology

Many studies have characterized known species of lactic acid bacteria (LABs), noting their potential health promoting features. However, it is known that some LABs have traits, such as antibiotic resistance, that may have a negative impact on one's health. This study's purpose is to characterize 8 strains of LABs, each of which were isolated from one of 8 probiotic products, purchased without a prescription in Utah stores. All 8 strains were gram-positive bacilli, all of which exhibited antibiotic resistance to vancomycin and bacitracin as expected. Five of these 8 were resistant to cefoxitin and 3 were resistant to ciprofloxacin. While none of the strains were hemolytic after 24 hours of anaerobic incubation at 37 o C, surprisingly five of the eight strains were hemolytic when grown on sheep blood agar after 72 hours of incubation, an indication of the potential for pathogenic ability. Further characterization of the LABs' culture supernatants to inhibit pathogens, the LABs' ability to resist bile salts and their acid tolerance will be done. While many researchers have studied type culture LABs, this study is one of few that characterized probiotic strains obtained from products readily available to the consumer.

Sweetwater Creek Petrology

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Mentor ELIZABETH BALGORD

Poster 13, Session 2

Geoscience

The Claron Formation is the cliff-forming unit responsible for the iconic scenery in Bryce Canyon Nation Park. This study focuses on the Sweetwater Creek member from the upper 450 m of the Claron Formation which is contains alternating layers of siltstone, bioturbated sandstone, and limestone. The Sweetwater Creek section was chosen because of its uninterrupted position above the well-dated Pine Hollow Formation. The Pine Hollow Formation contains purple diagenetic mudstone with interbedded cobbles. The base of the Sweetwater Creek member is defined by the first appearance of a red mudstone that lightens into the dominant and iconic orange sandstones common throughout the region. Overlying the basal mudstones, the Sweetwater Creek grades into interbedded limestones and quartz-rich sandstones. Sandstone beds fine upwards into siltstones which vary from well cemented to very friable; the sandstone units contained both trace fossils and body fossils including shell fragments, gastropods, and bivalves. Preliminary petrographic analysis indicates that the majority of the sandstones are calcite cemented quartz arenites with minor clay, K-feldspar and accessory zircons. Initial observations from the Sweetwater Creek member support heightened tectonics activity in this area during the Laramide Orogeny that led to a combination of lacustrine and fluvial deposits in this area.

Building A Solar Simulator

Author TIMOTHY ROSENVALL

Mentors KRISIN RABOSKY
COLIN INGLEFIELD

Oral Presentation

Physics

Over the last twenty years, more than one million solar panels have been installed in the United States powering millions of homes, businesses and industries (http://fortune.com/). As this new sector of power generation grows, it's critical that the efficiency and longevity of these solar panels continues to accelerate. One of the key components to measuring the efficiency of a solar cell is a solar simulator, which is used to emulate sunlight. We planned, built and calibrated a solar simulator. With this new equipment, we have started taking preliminary data of new a new type of solar cell material, called a perovskite. We are working to improve the efficiency of this new material for use in solar cell devices at Weber State University.

Development of an Assay to Determine Inhibition of Pathogens by Lactic Acid Bacteria

Authors CYNTHIA RUDHERIC
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Poster 16, Session 2

Microbiology

Development of an Assay to Determine Inhibition of Pathogens by Lactic Acid Bacteria UG Researchers: Cynthia Rudh, Christian Curneal, Brody Gibson and Ying Zhang Mentor: Karen Nakaoka, Ph.D. Many have studied known species of lactic acid bacteria (LABs), noting their potential to inhibit pathogens. One assay requires that both the LAB and the pathogen grow on the same agar plate. These studies often utilized Mann Rogosa Sharp (MRS) medium that favors the growth of the fastidious LABs. However, when our lab attempted to replicate these studies using LABs obtained from over the counter (OTC) probiotics, the pathogens struggled to grow on the MRS media even without challenge by the LABs. In fact, Staphylococcus aureus exhibited faint growth at best and lost its ability to produce its yellow pigment when grown on MRS media. Thus, this study's purpose was to determine which media would promote the growth of both the LAB and 5 pathogens. It was determined that sheep blood agar (SBA) would grow the 8 LAB isolates AND the 5 pathogens as well. This will allow for further characterization of the LABs' ability to inhibit these 5 pathogens. While many researchers have studied type culture LABs, this study is unique in its use of SBA to characterize pathogen inhibition by probiotic strains obtained from OTC products.

Plant Kin Recognition Response Pathways and Variations with Fungal Partners.

Author NICHOLAS SHAW

Mentor HEATHER ROOT

Poster 7, Session 2

Botany

Arbuscular Mycorrhizal (AM) fungi richness has been shown to increase plant productivity and decrease plant competition, although it has been more recently found that these relations are generally dependent upon species identity rather than generic richness. Additionally it has been shown that 'low quality' AM fungi a can avoid plant discrimination in the presence of a high AM fungal richness community. Given that many plants reduce below ground competition when grown with kin plants, called a Kin Recognition Response (KRR), and that this system can be used to measure plant trait responses to differences in AM fungal richness. We tested the hypothesis that increasing AM fungal richness decreases a KRR to neighboring kin plants. We found that growing kin Taraxicum officinale plants at AMF richness treatments of one, three, five, and seven AMF species per pot resulted in a significant trend of decreasing KRR, a measure of shoot mass to root mass. Although our results showed the AM fungal species identities affect on KRR was not clear. The results indicate that increased AM fungal richness may reduce the plant's ability to effectively identify and respond to neighboring kin plants.

Characterization of Zinc Oxynitride Thin Films

Authors CHARLES SMITH
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Poster 23, Session 2

Physics

Liquid crystal displays (LCDs) and organic light emitting diodes (OLEDs) use oxide based thin film transistors. Zinc oxynitride (ZnON) is a candidate for next generation electronics in LCDs and OLEDs. Here we investigate the correlations between the composition of ZnON and its calculated band gap energy. The composition of our samples is found using energy dispersive x-ray spectroscopy. For the band gap measurements, we have designed and built our own ultraviolet-visible spectrophotometer (UV-VIS). Using the transmission data from the UV-VIS we calculated the band gap energy of the material. We will discuss the experimental methods used to achieve our results.

Building and Caching Behaviors of Woodrats in a Laboratory Setting

Authors RYLEE SMITH
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Mentor MICHELE SKOPEC

Poster 27, Session 2

Zoology

Woodrats (genus Neotoma) are well known for their building and caching behaviors and build elaborate structures called middens. In the wild, middens serve as shelter and a storage site for their caches. While the caching behavior of woodrats has been rigorously studied in captivity, building behavior studies are lacking. We wanted to determine if building and caching behavior could be empirically studied in a laboratory setting. Three groups of woodrats were used in the experiment: N. albigula, N. lepida from the Mojave desert, and N.lepida from the Great Basin desert. These species of woodrats are commonly found in desert terrain where resources are limited and all three display different midden structures in the wild. To test for differences in building and caching behavior the woodrats were placed in a nesting cage that had access to a secondary area that contained objects the woodrat could use for building or caching. The caching objects included jingle bells and rabbit chow (food) while the building objects included sticks and cotton nesting material. Each day the objects used or collected were counted and replenished. There were significant differences in building and caching behaviors between species. N. albigula favored cotton equally to sticks and bells, but favored sticks more than bells. Great Basin N. lepida favored cotton more than sticks and bells, which were favored the same. Mojave N. lepida preferred cotton more than sticks and sticks more than bells. We conclude that woodrats do display species specific building behavior in the laboratory. Additional information collected via remote video surveillance will reveal the amount of time devoted to building and caching activity.

Double-Crested Cormorants Foraging Responds to Fish Stocking in Suburban Ponds in Northern Utah

Authors DUANE SOWARDS
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Poster 28, Session 2

Zoology

Double-crested Cormorant (Phalacrocorax auritus) foraging on fish populations has become a problem in North America. Our project quantified the level of Cormorant foraging in local stocked fishing ponds in relation to water temperature, turbidity, and fish-stocking date. We hypothesized lower water temperatures would lead to greater foraging success. Foraging was observed at two ponds: Farmington Pond and Meadow Creek Pond. We surveyed both ponds concurrently, taking a census of the number of Cormorants present, the surface water temperature, and turbidity. We attempted to document all instances of successful foraging by Cormorants. Cormorant foraging success was estimated by how many fish were caught per hour. We determined relations of fish per hour versus: mean daily water temperature and turbidity, number of days post fish stocking, and mean number of Cormorants fishing per hour. We found a positive correlation between the number of Cormorants at a given pond and the number of fish caught per hour and a negative correlation between the number of days since the ponds were stocked and the number of fish caught. Our findings indicate that Cormorant foraging success at stocked ponds in northern Utah is driven primarily by the stocking dates.

Role of Great Salt Lake Elevation on Heavy Metal Concentrations

Authors GARY STICHT
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Poster 14, Session 2

Geosciences

The Great Salt Lake (GSL) is a large but relatively shallow lake that serves as the terminal basin of one of the largest interior drainage systems in the West, Small fluctuations in lake depth due to variations in climate or anthropogenic activities can expose many square miles of lake bed. The rivers, streams and influx from groundwater that feed the lake contain heavy metals that can become concentrated in the GSL waters and sediment. Dry lakebed sediments have the potential to become airborne, impacting air quality and affecting human health. The Bear River is a major tributary supplying a substantial portion of the freshwater recharging the GSL. Proposals to divert water from the Bear River to a new reservoir for freshwater storage would negatively impact the recharge of the lake, exposing additional lake bed sediments making them susceptible to become airborne in dust storms. In this research project, carried out as part of a semester-long Geochemistry course, we are investigating the metal content of lake sediments and proposing models to understand the geochemical interactions of riverine input, lake water, and lake sediments.

18S Genetic Analysis of Seasonal Algal Communities in the Arctic

Author BRYN LITATTERSALL

Mentor CARIE FRANTZ

Poster 20, Session 2

Microbiology

Sea ice is a critical habitat for Arctic primary producers. The Arctic sea ice melt season is lengthening as a result of climate change, and the effect this will have on microbial communities, especially sea ice primary producers, is unknown. To begin to address this question, we characterized the active and total algal community in sea ice at different points during the spring/summer melt season using 18S rRNA and rDNA amplicon data. This is the first time, to our knowledge, that the microbial community in late-season "rotten" Arctic sea ice has been characterized. Analyses are ongoing, but we expect significant community shifts based on chlorophyll profiles from our sea ice samples.

Synthesis of Metal Chelate Supplement by Liquid Assisted Grinding

Authors BRADEN THORNTON
CONNOR PACK

Mentor BRANDON BURNETT

Poster 9, Session 2

Chemistry

A mineral chelate is a metal ion that is encompassed by an organic compound. Mineral chelates have recently become popular among the dietary supplement industry, as they have shown increased bioavailability and absorption. The traditional process of making mineral chelates is through either a dry mixing of metal source and organic compound or a solvated reaction within a large water bath. The dry mixing method has proven to not actually form chelates and the large solvent baths are very cost inefficient. A new method incorporated here at WSU, called liquid-assisting grinding, has been successful in generating highly pure mineral chelates. Liquid-assisted grinding is a marriage between the two traditional methods, using very little solvent to produce our products. Herein, we will discuss the optimal conditions for synthesizing mineral chelates for dietary supplements.

COLLEGE OF SOCIAL & BEHAVIORAL SCIENCES

Perceptions of Racial Profiling

Author PAYDON BARNHART
Mentor MONICA WILLIAMS

Oral Presentation

Criminal Justice

Racial profiling is described as the use of racial or ethnic background as the rationale for suspecting an individual has committed an offense (aclu.org). The media portrays racial profiling by police officers as a rising issue in communities today, but we do not know much about the public perceptions of racial profiling in Utah communities. This study analyzes data from a survey administered in six urban neighborhoods within one city to gather information on individuals' feelings, experiences, and responses towards local police. This study specifically looks at survey questions related to racial profiling, such as how often individuals had been stopped by officers and how often they felt like they had been stopped because of their race or ethnicity. The data were broken up into three race groups: white, Hispanic/Latino, and other (including Blacks, Native Americans, Asian Americans, Pacific Islanders, Arab Americans). The results indicate individuals from some racial groups were being stopped more than others, and compared to whites, Hispanics/Latinos and other minorities were more likely to feel like they were being stopped more often because of their race or ethnicity. Though some minorities experience racial profiling they may not believe that racial profiling is a widespread practice in their city. On the other hand, Hispanics/Latinos were being stopped just as often as whites, but they were more likely to feel that the practice was widespread. The findings indicate that racial profiling is occurring in at least one city in Utah, and some racial groups do feel as though they are being targeted. Future research should assess why some community members have these impressions of racial profiling within the community and what they think would help fix the problem.

Residential Stability and Trust in the Police

Author CHRISTOFFER BINNING
Mentor HEEUK LEE

Poster 1, Session 1

Criminal Justice

Studies have shown that the homeowners of a neighborhood may be a crucial source of stability and social cohesion in a community where they reside. Few empirical attempts have been made to identify the residential stability associated with the level of trust in the police. Using community survey data collected from over 400 citizens in a city in one of the mountain states, this study explores the importance of residential mobility, public perception and experience with police in predicting trust in the police. The results from the analysis found statistically significant predictor variables in support of the existing literature in regards to public trust in the police. There was a significant relationship between the residential stability and trust in the police. Limitations and future studies are discussed.

Project Peru: An Ethnography in International Humanitarian Aid

Author GIOVANNA BONELLA
Mentors BARRETT BONELLA
MARK MERKLEY

Oral Presentation

Social Work and Gerontology

International humanitarian aid is sometimes criticized for failing to reach sustainable objectives, but is also lauded as an excellent form of pedagogy in community engaged learning. Professors and students from Weber State University participated in a project to offer humanitarian aid to Chiclayo, Peru with the intent of building water wells, renovating a preschool, enhancing the curriculum of the preschool, and building a women's culinary training center. The project was guided by the UN's sustainable development goals, particularly goal one of eliminating poverty, goal four of ensuring inclusive quality education for all, and goal five of achieving gender equality for and empowering women and girls. To assess the potential for international benefits, positive learning potential for students, and the potential for unintended consequences, I participated in a focused ethnography of the project, exploring the culture of participants, the impact the service had on the students, and the impact it had on the recipients of the service. The project was funded in part by the Office of Undergraduate Research and submitted to the Utah Campus Compact to be presented on in February of 2017. The presentation will summarize the findings of the extensive data collected on the students, participants, and recipients of the service.

The Deacons for Defense: Armed Reformist Insurgency for Civil Rights

Author RHETT COOK
Mentor KATHRYN MACKAY

Poster 4, Session 1

History

The Deacons for Defense and Justice (DDJ) were founded by black men in Jonesboro, Louisiana in 1964. Many leaders and members were veterans of World War II and Korea. At their height, the Deacons operated 21 chapters, primarily in Louisiana and Mississippi. They learned to use firearms while hunting in their youth and from their experiences on the bloody battlefields of Europe, the Pacific, and Korea. The Deacon's purpose was to protect black neighborhoods against the terrorism of the Ku Klux Klan (KKK); safeguard white civil rights workers for the Congress of Racial Equality (CORE), and stand against the corruption of local police by using legal, nonviolent means to achieve political and racial equality in the segregated South. When necessary, the Deacons practiced armed self-defense. The DDJ acted in the role of a reformist insurgency. A reformist insurgency does not aim to replace the existing order but rather reform political, economic, and social institutions and attitudes. Due to their bravery, military training, and reliance on the right to keep and bear arms, the Deacons helped hasten the demise of segregation in the Deep South.

Effects of Cell Phone Usage Upon Sleep Quality in College Students Cook, M. C. & Fowler, L.A. Depart

Author MERISSA COOK
Mentor LAUREN FOWLER

Poster 12, Session 1

Psychology and Neuroscience

The number of college students who own cell phones and how much they depend upon their cell phones has increased dramatically over the last decade. The usage of cell phones has shown to affect health in various ways, including sleep (Repacholi, M., 2001). Exposure to the brightness of the light emitted from a cell phone's screen right before bed has been shown to affect its user's sleep quality (Hersner & Chervin, 2014). The goal of this study however, is to assess the relationship between cell phone usage throughout the day and the user's quality of sleep. Participants will be given The Pittsburgh Sleep Quality Index (PSQI) to measure sleep quality over the previous two nights. They will also be given the Mobile Phone Problem Use Scale. This scale will be used to measure the amount of time they spent on their phone over the previous two days. Data collection are ongoing, but results are expected to show that increased cell phone use throughout the day will result in poorer sleep quality. Individuals need to be aware that the time they spend on their phone may be affecting their sleep and overall health.

The Effect of REM Sleep on Cortisol Levels and Perceived Happiness

Author SAMANTHA EDMUNDS
Mentor LAUREN FOWLER

Poster 11, Session 1

Psychology and Neuroscience

Rapid eye movement sleep (REM) is a period of sleep during which dreaming, rapid twitching movements of the eyes, muscle relaxation or paralysis, and other physiological changes take place. Studies have shown REM to be involved with processing emotions and emotional memories, as well as for learning, thinking, and organizing information. The sleep-wake cycle and REM have their own rhythms, and disruptions to these rhythms can affect many different circadian rhythms, including the cortisol rhythm. Cortisol, a hormone associated with stress, fluctuates daily, with levels typically peaking in the early morning and declining throughout the day. Cortisol may also have an effect on happiness and emotional regulation. Decreased or interrupted REM may disrupt the normal rhythms of cortisol release, which could contribute to higher levels of stress or lower levels of happiness. In order to assess the effects of REM sleep on cortisol and subsequent happiness, REM sleep, as well as many other characteristics of sleep, will be assessed using a motion tracker that participants wear for 5 days. During this time, they will also have waking cortisol levels assessed. In addition, participants will also be asked to complete a Subjective Happiness Scale and the Pittsburgh Sleep Quality Index. Data collection are ongoing but it is hypothesized that that those who experience less REM sleep per night will experience greater awakening cortisol levels and lower levels of perceived happiness and perceived sleep quality. The information obtained from this study can be used demonstrate how sleep quality affects cortisol and subsequent perceived happiness.

Local Awareness of Hydraulic Fracturing in the Uinta Basin

Author CYNTHIA ELLIOTT
Mentor DANIEL BEDFORD

Poster 3, Session 1

Geography

Fracking is an unconventional method of retrieving natural gas from shale rock in the earth. It can boost economies and create jobs, but it can also negatively impact the environment. This study addresses whether or not proximity of residence to fracking sites affects the awareness and opinions a person has about hydraulic fracturing. A survey was conducted in cities close to, and far away from fracking sites in Utah. Results indicated that people who live close to fracking sites have a higher awareness of fracking, and are more decided in their opinions of it; they lean towards support of fracking. People who live far from fracking sites are more unaware of fracking, and have more scattered and undefined opinions of it; they lean slightly towards opposition of fracking.

Daily Activity Paired with Sleep Quantity Impacts Prospective Jurors' Decision Making and Empathy

Authors KENNY GRIFFEY
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Mentor LAUREN FOWLER

Poster 10, Session 1

Psychology

In the legal system jurors are called upon to make decisions that affect the lives of others. Many factors affect how jurors make decisions, including how active they are during the day and the amount of sleep they get at night. Restricting sleep by only a couple of hours per night has been shown to affect decision making in a way comparable to what happens after two nights of total sleep deprivation (Killgore, 2010). This study is designed to assess how overall activity levels and sleep duration affect prospective jurors' ability to make decisions and empathize with a defendant. Daily activity and sleep quantity will be monitored through a Motion Watch activity tracker. Decision making will be assessed through modified cases of traffic felonies, which will measure perceptions of guiltiness and degree of punishment (Kaplan & Kemmerick,1974). Empathy will be assessed using the Interpersonal Reactivity Index. Results are expected to show low levels of activity and reduced duration of sleep in jurors will impair decision making processes and lower empathy levels toward the defendant. Research upon jurors and how sleep affects them is relatively unexplored and should be considered when jurors are asked to make life-changing decisions.

Effect of Sleep Quality and Duration on Decision Making and Empathy in Prospective Jurors

Authors LAUREN HOMER
KENNY GRIFFEY

Mentor LAUREN FOWLER

Oral Presentation

Psychology and Neuroscience

Sleep quality and duration have been shown to be integral to decision making, with poor sleep quality and decreased sleep associated with reduced ability to make logical decisions. In addition, sleep quality is associated with the ability to process emotional stimuli and to empathize with others. While sleep quality impacts daily functioning for everyone, poor sleep can have a substantial deleterious effect on those who are tasked with making life or death decisions, as is the case with jurors. The stress of serving on a jury can often affect many aspects of the jurors' lives, including sleep quality and emotional processing (Feldmann & Bell, 1993). This study is designed to assess the effects of sleep quality and duration on decision making and empathy in prospective jurors. Sleep quality and duration will be assessed using the Motionwatch activity tracker, as well as by the Pittsburgh Sleep Quality Index (PSQI). Decision making will be determined based upon modified cases of traffic felonies that measure perceptions of guiltiness, as well as punishment ratings (Kaplan & Kemmerick, 1974). Empathy will be assessed using the Interpersonal Reactivity Index (IRI), which measures both perspective taking and empathetic response. Results are expected to show that sleep quality and duration affect both decision making and empathy in prospective jurors, with lower sleep quality resulting in harsher penalties and lower empathy toward the defendant. This is an area of research that is virtually unexplored, and potential jurors should be made aware of the impact of sleep quality when they make these vital decisions about the lives others.

Implications of 5-HTT and DAT1 Genetic Polymorphism on Social Anxiety and Stress Response

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Poster 6, Session 1

Psychology

A growing number studies have examined the genetic basis of psychological disorders, but less is known about the genetic basis of social anxiety. Literature does suggest a relationship between social anxiety and certain genotypes of the serotonin (5-HTT) and the dopamine (DAT1) transporters. The serotonin transporter is polymorphic, consisting of a variable number of 20- to 23-base pair repeats. The 5-HTT exists as two common alleles: the short (S) and long (L) alleles. Previous studies have found that the short allele is related to depressive symptoms, and trauma has a worse effect on those with the S/S or S/L genotype. (Goldman et al., 2010). In studying social phobias, research has increasingly surrounded striatal functioning, implying a role for dopamine. DAT1 is coded for by the SLC6A3 gene, featuring 9- and 10-repeat alleles as the two common variants (Gadow et al., 2008). A study of autistic children found those who possess the 10-repeat allele on both chromosomes experience social anxiety more severely than other genotype (Gadow et al., 2008). To induce and assess social anxiety, participants were given the Liebowitz Social Anxiety Scale (LSAS) and were subjected to a stress-inducing situation using the Trier Social Stress Test (TSST). The TSST is a validated procedure requiring participants to deliver a speech with little preparation and answer challenging math problems in front of an evaluative group (Kirschbaum et al., 1993). Stress response was recorded via galvanic skin response, heart rate, and the LSAS. It was predicted individuals with the S/S genotype would experience greater social anxiety and stress response than those with the S/L genotype, and even more so than those with the L/L genotype. Also, adults with the 10/10-repeat genotype for the DAT1 gene are anticipated to experience social anxiety at a greater level than those without the 10/10-repeat genotype.

Particulate Matter Pollution Monitoring and Community Perception in Weber County

Author LORRIELEE LEE
Mentor DAN BEDFORD

Poster 2, Session 1

Geography

The Particulate Matter Pollution Monitoring was conducted in Utah's Weber County, from the spring of 2016 to early winter of 2016. The campaign had two targets: the first was to investigate the 24-hr average concentrations of PM2.5 and PM10 to gain an understanding of the dynamics of particulate pollution, and the correlation, or lack of correlation, of topographical elevations and the duration of poor air quality occurrences. The second was to ascertain the current level of understanding and improve upon the level of understanding, of Weber County citizens, their perception of air pollution and their possible contribution to poor air quality. This paper reviews these topics and analyzes air quality sensor data from spring to early winter of 2016 in an attempt to ascertain human contribution to the air pollution problems that plague Utah.

Attitudes Towards Electronic-cigarettes (E-cigs) and Vaping: A Comparison of Non-smokers and Nicotin

Author CAYLA LYNCH
Mentor TODD HILLHOUSE

Poster 8, Session 1

Psychology

Tobacco smoking is a major health concern in the United States because of the detrimental side effects after long term use. Recently, Electronic cigarettes (E-cigs) and electronic nicotine delivery systems (ENDs) were introduced into the market, which claim to be a "safer" option as compared to traditional cigarettes and can be used as a smoking cessation device for current cigarette smokers. However, the scientific community has published conflicting results regarding E-cig safety, which have created confusion for the general population on the safety of E-cigs. For example, a Great Britain study found that approximately 45% of people believe that E-cigs are more harmful than traditional cigarettes or were unclear as to which option is safer. The aim of this study is to compare non-smokers and nicotine users attitudes towards E-cigs and ENDs. We designed this study to survey four groups: 1) non-smokers; 2) traditional smokers; 3) E-cig/ENDs smokers; and 4) E-cig/ENDs smokers that switched from traditional cigarettes. This research design allows us to evaluate how attitudes might change based on your experience (or inexperience) with E-cigs/ENDs. Additionally, the nicotine usage data for the latter three groups allows for comparisons of nicotine consumption across groups.

The Impact of Pokemon GO on Activity Levels

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Poster 13, Session 1

Social Work

Obesity is a growing problem in the United States despite clear recommendations to increase physical activity. Novel approaches to encourage and measure activities have been created to help people get active such as the inclusion of accelerometers in smartphones, advanced pedometers, and games that encourage exercise. Pokémon GO was one such game that gained extensive media attention and multiple reports of increasing activity in people. In order to test the impact of Pokémon GO on activity levels, five ABA single subject designs using college students were implemented measuring baseline activity against activity while using the app. Consistent patterns and statistically significant changes were not found, however, increases in activity were found on average in all but one participant. Apps such as Pokémon GO may warrant additional study over longer periods of time or with larger groups to test the significance it has on activity.

Honey, Did you Remember the Milk? Metacognitive Insight and Accuracy in Couples

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Poster 9, Session 1

Psychology

Couples often divide and conquer when it comes to what information each person remembers. For example, maybe one person is good at remembering directions, so the other does not need to. Despite how common this behavior is among couples, an important question is, do we really know what are partner will remember? Studies of metacognition often require participants make judgments of learning (JOLs) about what they will later remember, and accuracy of these JOLs can be assessed. A recent meta-analysis (Rhodes & Tauber, 2011) found that individuals have a moderate ability to predict their own memory performance. However, very little is known about the ability to predict your partners' memory performance. The current study will recruit romantic adult couples who have been co-habiting at least 6 months. Each person in the couple will be given a variety of memory tasks meant to reflect real-life scenarios that one would likely encounter, such as remembering directions or a grocery list. For each set of materials, individuals will give prediction (i.e., JOLs) regarding their own and their partner's performance. These predictions will be compared to actual performance in order to investigate whether people better at predicting their own performance, their partners', both equally.

Electronic Cigarette (Vaping), Tobacco, and Drug Use Trends Among College Students

Author MAKENZIE PETERSON
CAYLA LYNCH
Mentor TODD HILLHOUSE

Poster 7, Session 1

Psychology

Over the past decade (2005-2015), there has been a 5% decreased in the number of American's that smoke traditional cigarettes; however, there has been a significant increase in the number of American's using alternative smoking devices, which include electronic-cigarettes (E-Cigs) and electronic delivery systems (ENDs). In 2014, approximately 10% of the United State population reported using E-cigs or ENDs to some extent. While E-cig/ENDs prevalence is increasing in the United States, there is relatively little data on the usage patterns of these devices as compared to traditional cigarettes. The present sought to extend findings in two major areas of E-cig/ENDs research: 1) Provide a better understanding of E-cig/ENDs usage patterns (dosing regimen, amount consumed, duration of vaping session, etc.) as compared to traditional cigarette; and 2) Evaluate E-cig/ENDs, tobacco, and drug use in college students to determine if E-cigs are being used with other drugs of abuse (poly-drug use). Students at Weber State University were surveyed on their nicotine (combustible tobacco and E-cig/ENDs) and drug use. We believe this study will provide valuable information to the scientific community and policymakers on the usage patterns of E-cig/ENDs.

BACHELOR OF INTERGRATED SCIENCE

Necessity vs. Opportunity Entrepreneurship in Developing Nations

Authors MATTHEW LARGENT

Mentors DAVE NOVAK
JULIE RICH

Oral Presentation

Business Administration, Entrepreneurship, Geography

There are many competing definitions of entrepreneurship presented by scholars throughout the world. "Although there seems to be no generally accepted definition of entrepreneurship, many assessments are unified by the notion that entrepreneurship is about creating something new" (Reynolds et al. 2005, 208). Entrepreneurship is motivated by different individual life circumstances, and as such, there has been a distinction made between "opportunity-based" and "necessity-based" entrepreneurship as contextual motivations (Reynolds et al. 2005). This paper investigates entrepreneurship in Mozambique, Africa to better understand whether entrepreneurs in this nation are motivated by opportunity, necessity, or a mixture of both. A model is proposed suggesting that entrepreneurs lie on a continuum stretching between necessity and opportunity and are not just one or the other.

STUDENT INDEX

MENTOR INDEX