

CELEBRATING 10 YEARS OF RESEARCH

On behalf of the Office of Undergraduate Research, welcome to Weber State University's 10th 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 me 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.



WEBER STATE UNIVERSITY

Office of Undergraduate Research

ACKNOWLEDGMENTS



Thank you to the individuals and organizations whose generous donation have supported undergraduate research at Weber State University.

Cross Charitable Foundation

Elliot J. and Susie G. Hulet

Yaeko K. Bryner in Memory of Dale W. Bryner

Douglas & Shelley Felt Family Foundation

Downtown Ogden Inc

Richard F. II and Karen W. Fairbanks

George S. and Dolores Dore Eccles Foundation

Kristena M. Kons

Susan Marie Kons

Kathleen M. Lukken

F. Ann Millner

Ronald S. and Beth Mitchell

Brad L. and Camille Mortensen

Dale A. and Candy Ostlie

PSI CHI

Ralph Nye Charitable Foundation

Jodi L. Smith

Snowbasin: A Sun Valley Resort

Marci and Joe Sogan

Stephen and Susan Denkers Family
Foundation Trust

United Way of Northern Utah

Gloria Z. Wurst

Gardner Property

TABLE OF CONTENTS

Visual Arts/Poster Listing	4
Oral Presentation Schedule	6
Where Are They Now?	8

Abstracts

College of Applied Science & Technology	14
Telitha E. Lindquist College of Arts & Humanities	18
Bachelor of Integrated Studies	30
John B. Goddard School of Business and Economics	34
Jerry & Vicki Moyes College of Education	36
Dr. Ezekiel R. Dumke College of Health Professions	38
College of Science	48
College of Social & Behavioral Science	62

Schedule

8:00 AM - 11:00 AM Registration

Check in and registration for Symposium participants in front of Ballrooms of the Shepherd Union Building

10:00 AM - 11:30 PM Oral Session 1

Mid-Morning snack will be served

12:00 PM - 1:00 PM Student & Mentor Luncheon

Served in Ballroom A of the Shepherd Union Building

1:30 PM - 3:15 PM Oral Session 2

3:00 PM - 4:00 PM Poster Session

In Atrium of the Shepherd Union Building. Light snacks will be served

Visual Arts & Poster Display Listing (Session I)

1 Daniel Linford

The Association Between the Serotonin Transporter Promoter Region Polymorphism and Aggressive Behavior

2 Houda Nizam

The Serotonin Transporter Gene Polymorphism as a Predictor of Novelty Seeking, Smoking Behavior, and Cognitive Assessment of Risk

3 Logan Allen

The Effects of Perspective Taking and Religious Orientation on Attitudes toward Homosexuality

4 Patricia Dirks

Coordination of Guilt and Regret: A Developmental Study

5 Vanesa Martinez

Antimicrobial properties of Penstemon Cyananthus

6 Sarah Eccles

Native Plant Extracts as Inhibitors of Common Bacterial STD Pathogens

7 Adam Winegar

Range Expansion and Exponential Growth in Eurasian Collared-Dove

8 Ashley Van Leuven

Caching Behavior of the Specialist Woodrat *Neotoma stephensi*

9 Christopher Hill

Metagenomics of Great Salt Lake Microbes

10 Joshua Bradford

Comparisons of Hands on Learning versus Sharing on Student Performance

11 Kelli Behunin

Bat Community Composition in Northern Utah

12 Kendell Coburn

Investigating Supernova Structure

13 Kyle Spainhower

Species differences in the Restructuring of Syringeal Muscles after Denervation

14 Linsey Christensen

Lack of Song in Females Does Not Drive Sexual Dimorphism in Syringeal Muscle Composition

15 Son Nguyen

DNA Barcoding of Great Salt Lake Invertebrates

16 Andrea Prigmore

The Critical Theory of Communication in Organizations and National Patient Accounting Services

17 Militia Earl

Wildcat Nation

18 Morgan Drean

The Influence of the LDS Religion on Selecting a Romantic Partner

19 Taylor Proctor

The Parental Technology Trap: *Has it Caught You?*

20 Tiffany Dubbelman

Are Dining Service Campus TextClubs Profitable?

21 Ashley King

Role Models Within Families

22 Stacey Truax

Did you kiss him, Mom?: *A Qualitative Analysis of Single Mother Dating and its Impact on her Adolescent Children*

23 Joshua Campos

Audio-Visual Stimulation Optimization Algorithm for use in Brain-Computer Interfaces

24 Kathryn Black

The Many Faces of Injustice: *The Problem of History in Charles Dickens' A Tale of Two Cities*

- 25 Ashley Davis**
Adult Role Models for Youth
- 26 John Stanger**
The Link Between Zonulin and the Development of Autoimmune Disorders, such as Celiac Disease
- 27 Sarah Kortkamp**
Synthesis of Metal Organic Frameworks
- 28 Amanda Maw**
Patient Oral Hygiene Effectiveness and Acceptance of Using Toothpaste Containing Cranberry Extract
- 29 Chelsea Burr**
Toothbrush Sanitization:
A comparison of two methods
- 30 Chenylle Corbett**
Risk Assessment for Periodontal Disease
- 31 Cheryl Moore**
Oral Health Knowledge and Reported Oral Hygiene Behaviors in a Low Income Population
- 32 Emily Wiscomb**
Hepatitis C & Stigma:
An Investigation in the Dental Setting
- 33 Katie Gee**
Human Papillomavirus Risk Awareness Among Dental Hygiene Professionals
- 34 Summer Wallace**
Diabetes Risk Assessments
- 35 Veronica Laughter**
Effects of Magnification and Lighting on Improving Oral Health
- 36 Whitney Nye**
Sealant Retention: *An Evaluation of Weber State University Dental Hygiene Sealant Clinic*
- 37 JoLin Petersen**
Developing an Intervention for Post-Concussion using Baseline Data:
Sleep and Activity Levels
- 38 Emma Bentley**
Microbial Screening of Potable Water Sources
- 39 Kayla Blackford**
Survey of the Great Salt Lake Virosphere
- 40 Michael Petersen**
A Single-Board Computer Platform for In-Situ Gas and Aerosol Measurements in Earth's Atmosphere
- 41 Kari Godfrey**
Timing and Source Relationships of Campanian Strata, Southern Utah Basins
- 42 Sara Yearsley**
Captivating the Curious: *Implementing Technological Strategies as an Interactive Method on Science-b*
- 43 Michael Shaw**
Automated Tracking Antenna for High-Altitude Atmospheric and Climate Research
- 44 Karrie Freeman**
Hair & Makeup Design for "Of Myth & Mud"
- 45 Shelby Thomas**
Shelby Thomas-KCACTF
- 46 Kirsten Billingsley**
The Will Rogers Follies Dramaturgy
- 47 Derek Walden**
Sound Design for The Plain Princess
- 48 Clayton Price**
Charm Dramaturgy
- 49 Derek Williamson**
The Plain Princess, Hair and Makeup Design
- 50 Amanda Shaffer**
The Plain Princess Costume Design

51 Ryan Rigby

Childhood Stress: *The Coping Behaviors of Stress on America's Youth*

52 Daniel Simmons

Social Connectivity and the Youth Vote: *Comparing Youth Voter Turnout in 1992 and 2008*

53 Gia Rushton

Homeward Bound Homeless Shelter

54 Julia Vincent

Building Hope

55 Tori Lybbert

The Impact of Integrating Service Learning in an Elementary Special Education Classroom

56 Zachary Beames

Solar Wind Integrated Crate

Oral Presentation Schedule (Session I)

Time	312	316	Ballroom C
10:00 AM	Ian Crookston The Uyghur Diaspora in Kyrgyzstan: Perspectives on the Sino-Soviet Presence in Central Asia	Dwight Adams Justified Suspicion of Ontology-Speak	Autumn Brubaker Antibiotic Resistant Enterococci Isolated from Weber River Locations, Great Salt Lake and Patients
10:15 AM	Lorrie Rands Food, Comfort and a Bit of Home: <i>Maude Porter and the Ogden Canteen 1942-1946</i>	Benjamin Eschler Bilinguals and Religiosity	Matthew Fullmer Impact of fluoxetine on levels of IL-6, IL-10 and interferon gamma in C57BL6 mice
10:30 AM	Reginald Carlisle Cultural Heritage, What Is Passed Down?	Eric Bitton Lavender Oil and State Anxiety: Priming and Personality	Taylor Nelson Review of Wheat Cultivation and Celiac Disease
10:45 AM	Kirsten Stuart Bringing Awareness: <i>An Analysis of the Representation of Pit Bulls in the Media</i>	Rachel Rigley Divulging Emotion Through Realism	Jenna Deelstra The Efficacy of a Motivational Imagery Intervention in Distance Athletes
11:00 AM	Karlee Jensen Utah's Printed Media's Representation of Marriage Equality	Camrey Bagley Irene Ryan Nominee	Daniel Shallbetter Use of Common Household Desiccants as a Poison Ivy Block
11:15 AM		Erin Crouch Irene Ryan - KCACTF	Jace Stoker Hospital Cost Efficiency and Compliance with Laboratory Algorithms

Oral Presentation Schedule (Session 2)

Time	312	316	Ballroom C
1:30 PM	Aundrea Peterson Human & Sex Trafficking and Forced Labor	Shannon Call Edge effect on mycorrhizal infection occurrence in <i>Gutierrezia Sarothrae</i> [Asteraceae]	Ahmed Mohammed Comparisons of Pathogenicity and Drug Resistance of <i>Staphylococcus Aureus</i> Found Among Weber Students
1:45 PM	Adam Jones Relational Dialectics Applied to Pre and Post-Divorce Relationships	Julia Hull Interaction of Fungal Endophytes and Gall-Forming Aphids on Hybrid Cottonwood Trees	Brady Hansen Multiple Dimensions of Fitness – Predictors of Bone Mineral Density in Middle-Aged Women
2:00 PM	Zack Bjerregaard Behaviors, Motivations, Beliefs, and Attitudes Related to Bottled Water Usage at Weber State University	Andrew Corbin The Bee Fauna of Snow Canyon State Park, UT	Tamara Fox Variance of Toxin Producing <i>Clostridium Botulinum</i> in Utah Honey
2:15 PM	Sarah Dursteler <i>Hook-Up Culture: A Qualitative Analysis of Sexual Scripts within Gender and Religious Identities</i>	Taylor Nelson Genetic Classification of Arnica Species	Jordan Smith Outcomes and Complications of Capsule Endoscopy in a Community Gastroenterology Practice
2:30 PM	Preslee Patton Technology in Families	Josh Hall Incubation Constancy of American Avocets (<i>Recurvirostra Americana</i>) Nesting in an Extreme Environment	Tyler Rushforth Prevalence of ABO Blood Type and Diabetes Mellitus Type 1
2:45 PM		Ronald Marx Fabrication of Graphene Supercapacitors	
3:00 PM		Dusty Pilkington Determining Late Holocene environmental conditions for the Bobcat Rockshelter, Snake River Plain, ID	

WHERE ARE THEY NOW?

Participation in undergraduate research, scholarly and creative activities adds significant value to the college experience. Student learning under the direction of a faculty mentor is greatly enhanced and can have a lasting impact on a student's life. As we come together to celebrate 10 years of this campus symposium, we thought it would be appropriate to look back and examine the impact of undergraduate research on our previous participants. Below are a few testimonials from alumni of the Undergraduate Research Symposium and Celebration regarding the impact of their research experience on their personal and professional development.

Please visit the Bridge, in the Shepherd Union building to see more exceptional student researchers from past symposiums.

AMYJO JOHNSON-PROCTOR

Assistant Director for the Ott Planetarium

JASON DILWORTH

College of Visual and Performing Arts, State University of New York at Fredonia

MICHAEL FERGUSON

Chief Technologist of Advanced Software Products & Pursuits at L-3 Communications

RACHEL DeVOE-RUIZ

Institutional Analyst for Weber State University

LESLIE McFARLANE

Wildlife Disease Program Coordinator

BRYNN DUERDEN

Emergency Physician at San Diego VA Hospital ER (CA)

SARAH GARCIA

Obstetrician & Gynecologist at Simi Obstetrics & Gynecology (CA)

JOHN C. LINFORD

Scientist at Para Tools Inc. (MD)



MICHELLE GRONCKI

As I look back at my involvement in undergraduate research at Weber State University 10 years ago, it is clear my life has been enriched by the experience. From being more confident in my reading and evaluating of all the studies society is constantly bombarded with through the media, to applying skills learned to other areas of life. Collecting and analyzing data is an important part of training and handling hawks, owls, falcons and eagles and I feel I am more successful doing these things, because of my experience as an undergraduate researcher. However, I think most importantly, I now have an enhanced ability to be an academic role model, because of the personal research experience I can draw from. I have recently had the privilege to fly my birds for a young researcher studying "The Effect of Environment Enrichment and Stimulus on Raptor Behavior and Responsiveness". I look forward to further collaborations with her and possibly others.

The Relationship of Estrogen and Performance on Memory Tasks in Men and Women Ages 20-35

Mentor: Lauren Fowler & Eric Amsel (Psychology) 2004

This study examined the relationship of estrogen levels and performance on memory tasks in a young adult population. Numerous studies have assessed the relationship between estrogen levels and memory in postmenopausal women, as well as the relationship between testosterone levels and memory in postandropausal men. Most studies show a strong correlation between sex hormones and memory in older men and women. The lower the estrogen or testosterone levels, the poorer the performance on memory tasks. But these studies failed to address the relationship between sex hormones and memory in younger adults. This study's participants were 19 young adults, ages 20

to 35, who were tested twice over a 4-week period. Women were scheduled according to phase in their menstrual cycle, while men were tested two weeks apart to determine if they were more similar to low- or high estrogen women. Short-term verbal memory and spatial memory were assessed at each testing session. A multivariate, factorial analysis indicated that, contrary to previous findings, estrogen levels had no impact on memory performance, regardless of gender. These findings suggest that estrogen's effect on memory may be a factor of advanced age perhaps due to the loss of estrogen's activational properties.



LUCAS HALL

Being involved in undergraduate research while I was at WSU was one of the most influential experiences of my life. I can say that because doing research as an undergraduate helped solidify what I wanted to do as a career. Working closely with Drs. Mull and Cavitt in the Zoology Department was instrumental in helping me learn the techniques to be a good scientist. They also taught me that, even for an undergraduate, there are no limits with what we can achieve with our research. My undergraduate research experiences have helped me tremendously in graduate school as I have worked towards completing my PhD. Fresh out of WSU, I was able to engage quickly in new research opportunities and initiate a lot of my own projects. Furthermore, through the Office of Undergraduate Research at WSU I was able to travel and present my research findings at a variety of conferences. These research experiences have greatly facilitated my growth as a scientist and given me the confidence to excel and stand out as a graduate of WSU!

Comparative Study of Methods Used to Trap Nesting Snowy Plovers (*Charadrius Alexandrinus*)

Mentor: John Cavitt (Zoology) 2010

The need for the conservation of threatened species is becoming progressively imperative. With continuing development and recreational use, some species habitats are receding, resulting in population declines. The Snowy Plover (*Charadrius alexandrinus*; SNPL) is a small shorebird found breeding at Great Salt Lake. Because of population declines, the SNPL is considered a bird of conservation concern by the U.S. Fish & Wildlife Service and the Utah Division of Wildlife Resources. Due to its conservation status, the SNPL is monitored throughout its range. Unfortunately, different methodologies are used for studying populations. For example, at least three different methods are used to trap SNPL

at nests and these methods vary in design, cost, set-up time, and operation as well as trapping success. Thus, to manage for the conservation of this species and to provide information on trap effectiveness, data are needed which test each trap design. In this study, we compared the efficacy of three trapping methods used to capture SNPL at their nests. Our research questions were: what are the costs for constructing each trap? And which trap is most efficient / effective? Our results will provide information on trapping techniques for SNPL as well as other ground-nesting birds.



AMIKO UCHIDA
Senior Medical Student

I worked in Dr. Ron A. Meyers' laboratory studying the structure and function of syringeal muscle fibers in songbirds. During my time in the Meyers lab and with funding through the OUR, I was able to attend two scientific meetings, give four oral and two poster presentations, as well as publish a first-author manuscript in the *Journal of Experimental Biology*. This experience provided me an early introduction into basic science research, which was the catalyst for my career as a future physician-scientist. My experiences at WSU led to a continued pursuit of bench research while in medical school at the University of Utah, where I worked in Dr. Curt E. Hagedorn's laboratory investigating the stability of mRNA in liver biospecimens. My fascination with basic research later inspired me to pursue a research year for medical, dental, and veterinary students at the National Institutes of Health under the Howard Hughes Medical Institute Research Scholars Program. While there, I joined Dr. Yasmine Belkaid's laboratory studying the crosstalk between the nervous and immune systems in the gut using a mouse model. All of these research experiences provided me with invaluable opportunities to discover the mysteries, thrills, and at times frustrations of science.

Syringeal Muscle Fiber Organization in Female and Male Songbirds
Mentor: Ron Meyers (*Zoology*) 2010

Our lab has been investigating the syringeal structure of female and male European Starlings, whose syringeal muscles produce song by contracting at very high rates (over 150Hz). Myosin ATPase and immunohistochemistry were used to distinguish and quantify muscle fiber characteristics. We found two fiber types: fast and superfast. Females and males displayed similar patterns; the syringealis muscle had ~51% fast (mean diameter 26 μ m) and ~49% superfast (mean diameter 38 μ m) fibers, while the tracheobronchialis muscle contained ~27% fast (mean diameter 17 μ m) and ~73% superfast (mean diameter 36 μ m) fibers. This Starling data served as a baseline for comparison with other songbird species. Since female and male Red-

wing Blackbirds (RWB) sing at different frequencies, we examined their syringeal muscles for differences. We were surprised to find that both sexes had the same two muscle fiber populations as Starlings. Our analysis of Zebra Finches found significant differences between sexes. Non-singing females have no superfast fibers, while singing males have a muscle fiber organization comparable to Starlings and RWBs. These findings suggest that the superfast muscle fiber type does not dictate the frequency of song, but rather the ability to sing. Supported by NIH grant # DC004390 and a WSUSA Undergraduate Research Fellowship.



MICHELLE SNYDER-BURTON
Graduate Student at Utah State University - School Counseling Program

Currently, I am a graduate student at Utah State University in the School Counseling program. Participating in research as an undergraduate at Weber State University allowed me to stand out from the hundreds of other applicants in my graduate program. Research gave me a competitive advantage against the students who received their degrees without taking advantage of the undergraduate research opportunity. The journey through a research project expanded my academic experiences. It gave me the opportunity to work one on one with a professor as my mentor. It gave me the chance to explore innovative ideas in a field of study where I have a passion to make a difference. The process empowered me with knowledge and opportunities that are not available in a classroom on campus. I was able to apply my course knowledge by engaging in undergraduate research. Participating in research helped me to stand out from the thousands of other graduate school applicants. I personally gained a greater cultural competence in making cross-cultural connections and networking with professionals in my field of study. I found success in pushing forward and disseminating new knowledge from my research study. Most of all, I gained a sense of personal efficacy, identity and developed many skills that helped me grow professionally.

Religiosity as a Mediating Variable in Blended Family Conflict
Mentor: Paul Schvaneveldt (*Education*) 2011

The purpose of this study is to survey religiosity's mediating impact on blended family conflict by examining how it interrelates with family communication, cohesion, and marital commitment. Previous research involving intact family religiosity has established a relationship with family conflict as being a positive mediating variable. A lesser body of research is available when assessing religiosity's impact in a blended family environment,

and this current study aims to increase the body of knowledge. Subjects will be recruited from the community and asked to fill out a survey assessing the domains of family religiosity, family communication, family cohesion, marital commitment, and family conflict. Statistical analysis will then be conducted on the collected data to assess religiosity's impact on conflict in a blended family environment.



CHARLES FRANCIS

The associations and friendships that I made stand out as highlights from my involvement in undergraduate research while at Weber State. It was truly an honor to work with such great classmates. The experiences I enjoyed while studying and traveling are fondly remembered.

Sticks and Stones: A Collaborative Exchange Exploring Labeling and Stereotyping

Mentor: Mark Biddle (*Visual Communications*) 2006

“Sticks and Stones” is a collaborative project that explores labeling and stereotyping. It involves graphic design students from WSU, Northeastern University, in Boston, the University of Alabama, and San Francisco State University. This semester, participants from all four universities filled out an eight-question survey about their appearance, preferences, gender, and ethnic background. The results were randomly exchanged with students from different areas of the U.S. Each student was then asked to create a portrait of the one whose survey responses he or she received. Students were encouraged to incorporate stereotypes into the designs as they naturally arose, rather than suppressing them. When completed postcard portraits were distributed to each university for discussion everyone realized how easy it is to create an offensive statement even when one is not purposely trying to offend.

In the next phase, students were asked to design a portrait of themselves using map iconography as a visual metaphor. These were also exchanged with different university students who were asked to write “labels” based on each map’s contents. This March, students from all four universities will meet face-to-face in Los Angeles to discuss the labeling and begin a final “reaction” design summarizing the experience. Participants will also visit the Simon Wiesenthal Museum of Tolerance and an exhibit of the work of John Heartfield at the Getty Museum. Heartfield was a design activist who waged a single-handed war against Hitler. Ultimately, through the exchange of creative work, simulation, and candid interaction this project confronts social intolerance, encourages socially responsible design, and challenges participants to reconsider the ramifications of their own closely guarded stereotypes.



MARY GILLINS-McCUMBER

Osteopathic Physician at Salt Lake Regional Medical Center Emergency Department

Ribbon worms undergo varying salinity changes during low intertidal exposures. This study was conducted to determine if stress proteins in the ribbon worm, *Paranemertes peregrina*, are induced during exposure to rapid salinity changes. Ribbon worms were exposed to high salinity (39 ppt and 44 ppt; hyperosmotic) and low salinity (29 ppt and 24 ppt; hyposmotic) conditions for 24 hr periods. For the controls, ribbon worms were exposed to ambient salinity of 34 ppt. Significant weight loss and weight gain were measured in the worms exposed to the hyperosmotic and hyposmotic conditions, respectively. Stress proteins SP70 and SP90 were detected in the experimental worms, as well as in the control worms. The detection of stress proteins indicates their importance in nemertean physiology during response to salinity changes.

Stress Proteins in Ribbon Worms (Phylum: Nematoda) During Exposures to Varying Salinities

Mentor: Robert Okazaki (*Zoology*) 2004

I graduated from medical school at Kirksville College of Osteopathic Medicine 2008 (they renamed the school AT Still University). That does make me an Osteopathic Physician or DO. Residency in Emergency Medicine at York Hospital in Pennsylvania from 2008-2011. I then worked at Northwest Hospital in Randallstown, Maryland from 2011 to 2013 (suburb of West Baltimore). I am board certified the American Academy of

Emergency Medicine. Moved back to Utah when I found a job with Emergency Physicians Integrated Care (EPIC) working at Salt Lake Regional Medical Center Emergency Department last May 2013. I work about 4 shifts a month at Davis Hospital and Medical Center too.



PAULA FIET

Graduate Research Instructor at the University of Utah

I believe my Undergraduate Research learning experience provided me with the foundation I needed to eventually get into a research-oriented field of study. It has also opened many doors for me. Gaining the experience of working through the research steps with a caring and knowledgeable mentor (Lauren Fowler), and presenting that data at conferences helped me fully understand the process and appreciate why research is important. Having that research experience on my Vita has opened doors to fun and interesting research opportunities. Not only have I been able to travel to present my research (Montana for NCUR and Washington D.C. for Posters on the Hill), but also my Undergraduate Research experience has been a stepping-stone for me to experience even more research opportunities. While attending graduate school at Harvard University I was able to be a research assistant on a cognitive research study using ERP technology and assist on a dyslexia study as well. I'm currently in a doctorate program at the University of Utah (Educational Psychology – Learning Sciences and Cognition) where I am a research assistant and an instructor. I currently have my own experiment running in the Cognition Lab where undergraduates come to take my experiment for class credits! I love doing research! Thank you Lauren Fowler and WSU OUR!

Improving Working Memory Capacity in School Children Using Computerized in-Back Training

Mentor: Lauren Fowler (*Psychology*) 2010

Poor working memory capacity has been shown to be related to learning difficulties in math, reading, and other cognitive tasks in school aged children (Gathercole, & Alloway, 2006). Working memory is needed to allow manipulation of cognitive information in order to perform learning tasks. This study was designed to increase the working memory capacity (WMC) of participants (public elementary school children ages 7-9) using n-back task training games. The working memory capacity of each participant was assessed using the Automated Working Memory Assessment (AWMA). The experimental group received the working memory training intervention designed to increase working memory capacity. The other group (control) played low level educational

games that did not place demands upon working memory. The experimental group played Brain Workshop, a computerized working memory game based on the n-back task known to elicit demands upon working memory (Jaeggi, Buschkuhl, Jonides, & Perrig, 2008). Participants will be reassessed upon completion of training sessions. A 2 (experimental/ control) x 2 (pre/post) ANOVA design will be used to assess the effects of the training on WMC. Results are expected to show that n-back training increases the WMC in participants. Increasing the WMC of school children could increase their learning abilities overall.



BRYNN DUERDEN M.D.

Emergency Physician at San Diego VA Hospital ER (CA)

My research at Weber State was influential for my career. I learned a lot in preparation for becoming a physician and about all of the research that goes into medicine and all of science.

The Effects of Stress Proteins in Ribbon Worms (Phylum: Nemertea) During Exposures to Varying Salinities

Mentor: Robert Okazaki (*Zoology*) 2004

Ribbon worms undergo varying salinity changes during low intertidal exposures. This study was conducted to determine if stress proteins in the ribbon worm, *Paranemertes peregrina*, are induced during exposure to rapid salinity changes. Ribbon worms were exposed to high salinity (39 ppt and 44 ppt ; hyperosmotic) and low salinity (29 ppt and 24 ppt ; hyposmotic) conditions for 24 hr periods. For the controls, ribbon worms

were exposed to ambient salinity of 34 ppt. Significant weight loss and weight gain were measured in the worms exposed to the hyperosmotic and hyposmotic conditions, respectively. Stress proteins SP70 and SP90 were detected in the experimental worms, as well as in the control worms. The detection of stress proteins indicates their importance in nemertean physiology during response to salinity changes.



JOHN C. LINFORD PH.D.

Scientist at Para Tools Inc. (MD)

The WSU Undergraduate Research Symposium was my introduction to the wonderful world of research. Following my graduation as Scholar of the Year in 2005, I enrolled as a doctoral candidate in the School of Engineering at Virginia Polytechnic Institute and State University (Virginia Tech). In 2007, I was awarded the National Defense Science and Engineering Graduate Fellowship and the Central European Summer Research Institute Fellowship. I spent two summers in Juelich, Germany researching clock synchronization methods for the world's fastest computers and successfully defended my dissertation in 2010. Upon graduation, my research was awarded the Outstanding Doctoral Dissertation award. Since then, I have published over twenty works and contributed to systems ranging from high-performance modeling and simulation software for large-scale supercomputers to airborne real-time signal processing software. It was my formative experiences at WSU that set me on a path to being an active contributor to the international supercomputing community.

Creating the Campus Compact Web Page - A Service Learning Project

Mentor: David Ferro (*Zoology*) 2004

Learning allows for the possibility to do meaningful and applicable research in or for the community, to do service for the community, and for students to gain lifelike and life-fulfilling experiences as part of their university instruction. Campus Compact is a nationwide organization that assists in coordinating faculty, students, and community organizations for service learning projects. The goal of this project was to do a service learning project for the Utah branch of Campus Compact -create a usable web page for Utah Campus Compact - and see how a technical product development cycle can work in a service learning arrangement. In addition, in order to create this web page a fair amount of research needed to go into what

the web page should consist of as determined by the stakeholders- students, faculty, community organizations, university, community service directors. It was through numerous interviews with all these stakeholders that the eventual design was arrived at and a preliminary implementation was created. It is hoped that this design will actually serve as a template for Campus Compact branches. However, the process of completely fulfilling the design requirements of the primary client-Utah Campus Compact-and essentially "handing off" the web page to the client has yet to be done. The next stage of this project will determine-using this case-how successfully this can occur



LESLIE MCFARLANE

Wildlife Disease Program Coordinator, Utah Division of Wildlife Resources

I really appreciate the invaluable opportunity that was given me through my participation in the Undergraduate Research program at Weber State University. I received my first real hands on exposure to the scientific method and learned the value of primary references. The whole process taught me how to critically review other research and my mentor Dr. Cavitt taught me the real importance of statistical integrity. My participation in this program really helped me make the final decision to move forward and enter graduate school, which has ultimately resulted in a successful management career with the state wildlife agency. I highly recommend the Undergraduate Research program to any student who may be considering advanced degrees for the invaluable experience it provides and to help prepare you for your future!!

An Examination of *Elaeophora Schneideri* and Other Diseases of Northern Utah Moose (*Alces Alces Shirasi*) Population

Mentor: John Cavitt (*Zoology*) 2004

Whole blood was collected from 35 moose (*Alces alces shirasi*) that were tranquilized and relocated from urban areas in four Northern Utah counties. The blood serum was tested for the presence of antibodies to Epizootic Hemorrhagic Disease (EHD), Bluetongue, Malignant Catarrhal Fever (MCF), and Brucellosis (*Bruce /la abortus*). Four moose tested positive for antibodies to EHD, while two of these four also tested positive for Bluetongue antibodies, and one moose tested positive for MCF antibodies. In addition, a 7mm piece of the ear was examined for microfilaria from the arterial worm *Elaeophora schneideri*. No microfilaria were found, but this may not

have been reliable a method. Since two of the 35 moose exhibit ed clinical sign s of illness, and after euthanasia, were found to have high in festations of *E. schneideri* in the branching portions of their carotid arteries. In addition, four moose were found dead and were found to have high infestations of *E. schneideri* in the branching portions of their carotidarteries. None of the animals that tested positive for antibodies to Blue tongue, EHD, or MCF, exhibited any sign s of clinical illness. The prevalence of *E. schneideri* in Utah moose populations deserves further examination.



SARAH GARCIA

Obstetrician & Gynecologist at Simi Obstetrics & Gynecology (CA)

Weber State University's Undergraduate Research Program was an integral part of achieving my dreams of becoming a physician. As a freshman in college, I knew I wanted to become a doctor and that a difficult pathway lay ahead, but I wasn't sure where to start. I took a few required science classes and found an inspiring interest in Microbiology. I took as many classes as I could and knew that research would be in my near future. For anyone trying to get into medical school, research, and preferably a publication, is a must. Dr. William Lorowitz took me under his wing, to which I am still indebted, and we began the application process with our research proposal. My research path had begun and it was unforgettable. I spent numerous hours at the wastewater treatment plant and the Great Salt Lake collecting water samples, making media in the microbiology lab, measuring and counting plates, and writing and rewriting my final paper. In the end I presented my research at Weber State University's Undergraduate Research Symposium and in Atlanta at the American Society for Microbiology 105th General Meeting. It also was published! An accomplishment I never thought would be possible. I am now a practicing Obstetrician and Gynecologist in Simi Valley, California. Without the research experience I was able to acquire with this amazing program and mentors, my dreams of being a doctor may not have been possible.

The Effects of Wastewater Treatment on Antibiotic Resistance in Escherichia coli and Enterococcus sp

Mentor: Karen Nakaoka & William Lorowitz

(Microbiology) 2004

The effects of wastewater treatment on the proportion of Escherichia coli and Enterococcus sp. resistant to specific antibiotics were investigated at two facilities in Utah, one of which received hospital waste. Samples were taken from influent, effluent, effluent before disinfection, and anaerobic digester sludge. Enterococcus were isolated and enumerated using spread plates with Bile Esculin Azide agar. E. coli were isolated and enumerated using E. coli Petrifilm® followed by isolation on Eosin Methylene Blue agar plates. Disc diffusion assays were used to determine the resistance of Enterococcus to ampicillin, ciprofloxacin, gentamicin, nitrofurantoin, sulfamethoxazole-trimethoprim, tetracycline, and

vancomycin or E. coli to ampicillin, cefixime, ciprofloxacin, gentamicin, nitrofurantoin, sulfamethoxazole-trimethoprim, and tetracycline. An increase in the proportion of Enterococcus resistant to nitrofurantoin was observed in both facilities and to ciprofloxacin in one facility. The proportion of multidrug resistant Enterococci increased in one facility and decreased in the other. Wastewater treatment appeared to have little effect on E. coli; the only significant change was an increase in ampicillin resistance observed at one plant. The proportion of multidrug resistant E. coli decreased at both plants. The presence of hospital waste did not appear to have any effect.



JASON DILWORTH

Assistant Professor of Visual Arts & New Media, State University of New York at Fredonia

Weber State University taught me that research is more than academic achievement. It goes beyond understanding challenges and their causes. It drives the researcher to discover real solutions to real problems. Weber State University's unique culture combines academic excellence with practical application, positioning its students to make an immediate impact in the world. Principles such as these have empowered me to contribute to far-reaching applied research programs, from the NASA Global Hawk Unmanned Aerial Vehicle (improving our understanding of the processes that lead to the development of hurricanes and other severe storms), to DARPA (Defense Advanced Research Project Agency) challenges. I am making an impact in the world, and it is in large part due to this lesson I learned at WSU: research is the application of new knowledge toward real growth.

Findings and Solutions to designing Memorial Parks

Mentor: Mark Biddle (Visual Arts) 2006

Part of being human is remembering those who came before us and the legacy they left behind. Through research and a camera lens I have visited several parks—ones commemorating Martin Luther King and others created by folk artists that tell a much different story. What does it take to create a place that will draw in participants

and direct their thoughts—I intend to answer this question along with unveiling a design proposed for a Veterans Memorial in South Weber.



AMYJO JOHNSON-PROCTOR
Assistant Director for the Ott Planetarium

Participating in Undergraduate Research changed my life entirely. I was a pre medical student and decided to do Astronomy research because that would make my applications to medical school different than everyone else; what I didn't count on is having my eyes opened to a whole new world. Part of my research experience included traveling to the American Astronomical Society's meeting to present our research in a poster session. While at the conference, they released the first images from the Spitzer Space Telescope and I was mesmerized. I attended every talk and discussion about the findings - some of it I didn't understand, so that drove me to learn more. I had known about the Hubble Space Telescope, but to learn that we had other telescopes exploring different wavelengths of light was so exciting. Because of my experiences at that conference, I produced a planetarium show called "Expanded View" which talks about the different space telescopes and how they work together to help us learn about our universe. That production earned a Hubble Top Star and a Hubble Gold Star award from NASA and IGES. It has been shown in planetariums all over the United States and in several different countries. I have continued to write and produce planetarium shows and work diligently to further opening the world of science to people of all ages through public outreach and education.

Extragalactic Planets: Finding Tertiary Companions in Eclipsing Binary Star Systems
Mentor: Stacy Palen (*Physics*) 2004

Humans exhibit innate curiosity, always seeking that which lies beyond the borders of our visual scope. We have invented telescopes, satellites, and even sent people into space. Yet it is not enough; the inquisitive nature remains. We study the planets of our solar system and great excitement arises each time another planet is found within the Milky way, but what about outside our galaxy. We propose that planets also reside outside our galaxy; this is nothing new, yet we have never identified one. The recent MACHO project, attempting to locate dark matter, provided eight years of observational data on millions of stars, including 6835 possible eclipsing binary star

systems from the Large Magellanic cloud. By selecting eclipsing binary star systems and analyzing their light curves, we hope to discover tertiary companions within these systems. Currently, we are determining the period of rotation for selected star systems. If the period shows any consistent and predictable variations such as data errors cannot explain, we can conclude that we have discovered a tertiary companion; and perhaps the first observed extragalactic planet. Discovering a planet outside our galaxy will help confirm the hypothesis that planet formation, and possibly life, are common throughout the universe.



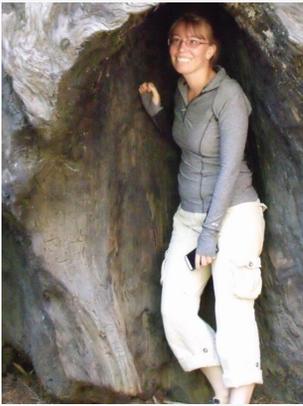
MICHAEL FERGUSON
Chief Technologist of Advanced Software Products & Pursuits at L-3 Communications

Weber State University taught me that research is more than academic achievement. It goes beyond understanding challenges and their causes. It drives the researcher to discover real solutions to real problems. Weber State University's unique culture combines academic excellence with practical application, positioning its students to make an immediate impact in the world. Principles such as these have empowered me to contribute to far-reaching applied research programs, from the NASA Global Hawk Unmanned Aerial Vehicle (improving our understanding of the processes that lead to the development of hurricanes and other severe storms), to DARPA (Defense Advanced Research Project Agency) challenges. I am making an impact in the world, and it is in large part due to this lesson I learned at WSU: research is the application of new knowledge toward real growth.

Creating the Campus Compact Web Page - A Service Learning Project
Mentor: David Ferro (*Computer Science*) 2004

Learning allows for the possibility to do meaningful and applicable research in or for the community, to do service for the community, and for students to gain lifelike and life-fulfilling experiences as part of their university instruction. Campus Compact is a nationwide organization that assists in coordinating faculty, students, and community organizations for service learning projects. The goal of this project was to do a service learning project for the Utah branch of Campus Compact - create a usable web page for Utah Campus Compact - and see how a technical product development cycle can work in a service learning arrangement. In addition, in order to create this web page a fair amount of research needed to go into what

the web page should consist of as determined by the stakeholders - students, faculty, community organizations, university, community service directors. It was through numerous interviews with all these stakeholders that the eventual design was arrived at and a preliminary implementation was created. It is hoped that this design will actually serve as a template for Campus Compact branches. However, the process of completely fulfilling the design requirements of the primary client - Utah Campus Compact - and essentially "handing off" the web page to the client has yet to be done. The next stage of this project will determine - using this case - how successfully this can occur.



RACHEL DeVOE-RUIZ

Institutional Analyst for Weber State University

The research I performed as an undergraduate helped me realize what a massive operation it takes to educate our students at WSU. So many departments, teaching, support and administrative, across campus play a vital role in helping our students achieve their goal of obtaining a college degree. The collaboration I saw as an undergrad has influenced me these past 13 years of writing reports and developing processes for the University so that communication and inter-office collaboration stays the number one goal in anything I do.

Parents' Perceptions of the use of Tuition and Fees

Mentor: Brenda Kowalewski

(Sociology & Anthropology) 2004

This study uses a consumerist approach to evaluate students' perceptions of the use of tuition and fees by gender, age, class standing, and college affiliation. A sample of students is drawn from a midsized state university in the West. Particular consideration is given to the evaluation of satisfaction with tuition spending and how that affects the students' educational experience. There are many theorists such as Baudrillard, Veblen, and so forth who wrote about consumerism in America. This study focuses on several of these hypotheses. It also offers analysis to universities about student satisfaction. Secondary data analysis and survey methodology are employed to investigate consumerism in higher education at this particular institution. Secondary data analysis involves revenue and expenditure data for fiscal year 2001-02. Survey data measuring students' perceptions of tuition use are also collected from a random sample of all students attending the university. Previous research demonstrates the presence of a consumerist culture among higher education students. Findings from this study are expected to corroborate this relationship. This

study uses a consumerist approach to evaluate students' perceptions of the use of tuition and fees by gender, age, class standing, and college affiliation. A sample of students is drawn from a midsized state university in the West. Particular consideration is given to the evaluation of satisfaction with tuition spending and how that affects the students' educational experience. There are many theorists such as Baudrillard, Veblen, and so forth who wrote about consumerism in America. This study focuses on several of these hypotheses. It also offers analysis to universities about student satisfaction. Secondary data analysis and survey methodology are employed to investigate consumerism in higher education at this particular institution. Secondary data analysis involves revenue and expenditure data for fiscal year 2001-02. Survey data measuring students' perceptions of tuition use are also collected from a random sample of all students attending the university. Previous research demonstrates the presence of a consumerist culture among higher education students. Findings from this study are expected to corroborate this relationship.

APPLIED SCIENCE & TECHNOLOGY

Solar Wind Integrated Crate

Zachary Beames

Mentor: Dustin Birch

Poster Display 56

Mechanical Engineering

As the engineering students of team SWIC we are excited to be doing research in the cutting edge of technology. Our question for research is: Can a mobile solar power plant provide the power necessary to power an RV and possibly aid in disaster relief in remote locations? In the light of recent natural disasters this could be very valuable information. SWIC will be designed such that it will lift itself on electromechanical jacks out of the bed of the truck by the press of a button. The Solar panels will then be on an easy access drawer system and an electrical tracking table that will be operated by a PLC. This electrical deployment technique will allow one person to set up and take down SWIC with minimal effort. Previous green mobile power plants were difficult to deploy, making it cumbersome to use. Physical strength or extreme know how will not be needed to use SWIC; the ergonomics of SWIC has been the most challenging aspect of this design project. After designing and fabricating SWIC we will put it to the test and compare its output to tabulated energy needs.

Audio-Visual Stimulation Optimization Algorithm for use in Brain-Computer Interfaces

Joshua Campos, Nicholas Smith
Mentor: Richard Fry

Poster Display 23
Computer Science

The purpose of this project is to design an algorithm that modulates input of audio-visual stimuli in order to optimize output from an EEG device in the form of brainwave frequencies. The EEG device has fourteen sensors spanning across all four cortical lobes and measures brainwave frequencies from the delta through beta range. The audio stimuli has been programmed as binaural beats and the visual stimuli as a flashing white circle on a blank screen that are modulated from 1 to 40 Hz. Output brainwave frequencies sync to the input stimuli frequencies differentially and the algorithm selects the best input to achieve a target brainwave response. This algorithm has the potential to improve detection errors common with brain-computer interface technologies, especially those utilizing audio-visual stimuli as input—such as a communication mode for locked-in patients or biofeedback devices for individuals with mental health issues.

A Single-Board Computer Platform for In-Situ Gas and Aerosol Measurements in Earth's Atmosphere

Michael Petersen, Joe Mahurin & Jennifer Stoddard
Mentor: Fon Brown & John Sohl

Poster Display 40
Department

Research balloons are a valuable tool for studying Earth's atmosphere and weather systems. However, a shortage of data exists for gas compositions and particulate concentrations at altitudes attainable by research balloons. Weight is a major constraint when selecting scientific instruments to fly on research balloons; this has limited the quantity and variety of science achievable with balloon systems. Miniaturization and increased processing power are making it possible to fly embedded systems capable of filling the gaps in atmospheric data. Our team has developed a data logging system that represents a new generation of scientific instruments for gathering and processing data from the edge-of-space and from the polluted atmospheric inversion zones common in urbanized mountain basins. The new Multi-Sensor Array system (MSAv4) is based on a commercially available single-board computer that runs a Linux operating system. The MSAv4 is lightweight and supports accelerometers, magnetometers, gyroscopes, humidity sensors, temperature sensors, pressure sensors, and an expandable array of particulate and gas sensors. Integrated compilers simplify hardware and software modifications while in the field. This system has successfully gathered data as high as the mid-stratosphere (31km) on WSU HARBOR (High Altitude Reconnaissance Balloon for Outreach and Research) Missions.

Homeward Bound Homeless Shelter

Gia Rushton

Mentor: Kristen Arnold

Poster Display 53

Sales and Service Technology

While individuals reside at the Homeward Bound homeless shelter in Midvale, Utah creating a home-like environment is vital to the transition process as it provides a more stable atmosphere and overall positive experience. However, this proves to be a difficult task as everyone envisions home differently. Hill (1991) found some individuals enjoy communal housing because it provides support while others do not like shared housing due to the intrusion of privacy. This further relates to Hill's findings that personal items should be integrated into the space. In relation to personal items; Grigg, Judd, Komiti, and Ryan (2008) also found that cherished items should be kept safe because a loss of a personal item relates to the loss of the individual themselves. Further, not only must shelters provide a safe environment to keep personal items, the atmosphere also must be free of violence and the building itself must be structurally safe for the transitional housing experience to have a positive impact. Another factor to consider in transitional housing is the spread of germs. Scott (2009) reports homeless shelters are often crowded and many individuals have poor health due to living on the streets. Additionally, homeless individuals commonly have a stressed immune system making it easier for germs and diseases to be spread. Also, in relation to a healthy environment; Carruthers, Morris, Tarrier, and Whorwell (2010) found a color's saturation has a larger impact on a person than the hue itself. Their research found that healthy individuals felt more connected to saturated colors as opposed to anxious and depressed individuals who chose de-saturated colors. Conclusively, the space itself must be personalized so one does not feel their privacy is intruded upon while at the same time the space must be warm and inviting so the individual has a desire to reside in the environment during the difficult time in their life.

Building Hope

Julia Vincent

Mentor: Kristen Arnold

Poster Display 54

Sales and Technology

The YCC or Your Community Connection, located in Ogden, Utah is the community's domestic violence shelter and exists to support the needs of local women, children and families when escaping from abuse. Research compiled of post shelter survivor's says, "Life difficulties of these predominantly successful domestic violence survivors highlight the need for specialized shelter intervention and continuity of care in the community" (Ham-Rowbottom et al., 2005). In order for the YCC to provide its necessary care to all its victims, it needs an updated building that has enough space, is sanitary, and incorporates a positive healing environment. The renovation of the YCC will create a new start for those escaping domestic abuse. Enhancing the atmosphere in the existing building to add a healing environment through improved sanitation, additional space, and including views and places of nature will create the refuge needed for victims. The healing of the victims' physical and psychological well being is only achieved through the communities programs and its environment.

Telitha E. Lindquist College of Arts & Humanities

Irene Ryan Nominee

Camrey Bagley

Mentor: Tracy Callahan

Oral Presentation (Session 1)

Performing Arts

Having been selected as a nominee for the Irene Ryan Scholarship, I was invited to compete at the Kennedy Center American College Theatre Festival. Each nominee was required to prepare two scenes and a monologue to present in front of adjudicators. My approach was to choose a strong acting scene, followed by a musical theatre scene and finishing with a contrasting monologue. This was challenging because the pieces had to fit into strict time constraints of three, two, and one minute(s). After presenting the scene we received feedback from respondents on our performance. It was very educational to hear feedback from a variety of sources and to watch talented performers from a variety of schools present their work. Having now attended the festival, I have an even clearer idea of what I can improve on if I get the opportunity to compete again. The festival was a wonderful opportunity to showcase my talents and to learn more about the extensive world of theatre.

The Will Rogers Follies Dramaturgy

Kirsten Billingsley

Mentor: Catherine Zublin & Jennifer Kokai

Poster Display 46

Theater

The Will Rogers Follies was performed at Weber State spring semester of 2013. Dramaturgy was utilized successfully pre-production and during the run of the show. A website was created with access to everyone involved, including the public. The website's mission was to promote and educate the audience in an effort to enhance the audience experience, as well as to aid in the preparation of the cast and production process. The site included a 'back stage' section, accessible to the cast and production team, created to promote better communication between the director, the cast and design team through easy access of the contact information, homework for the cast, rehearsal schedules, deadlines, meeting notes and production calendars. During the show, an attractive and fun to read education packet was inserted into the program as another chance for the audience to prepare to enter the world of the play. The lobby display included a costumed cowboy cast member teaching theater patrons how to spin a lariat, films of Will Rogers performing roping tricks and Will Rogers quotes.

The Many Faces of Injustice: The Problem of History in Charles Dickens's A Tale of Two Cities

Kathryn Black

Mentor: Hal Crimmel

Poster Display 24

English

John Locke's theory of Natural Law says that consequences naturally follow from actions and choices. Dickens, in his novel *A Tale of Two Cities*, explores this natural law of cause and effect. Commonly known as the cycle of history, Dickens is drawing attention to the historical problem of injustice repeating itself in the context of the French Revolution. Although the revolution offered the prospect of change, it changed nothing except the faces of those abusing power. In the middle of the obvious failure, Dickens proposes an alternate way to solve the problem. I propose that Carton rejects the historical cycle that produces injustice, not through suicidal submission to it, but through a symbolic rejection, and ultimate destruction of a belief that the abuse of power can ever produce justice. Carton is the only character in the novel who is capable of effecting real change because he fundamentally believes in the power of the individual, not in the illusory power of the collective. This is significant because Dickens is offering a solution to the problem of history—only when the current paradigm, which perpetuates injustice and failure, has been rejected, will there be the possibility of justice and freedom.

Cultural Heritage, What Is Passed Down?

Reginald Carlisle, Jayrod Garrett, & Kyle Poppitz
Mentor: Laura Stott

Oral Presentation (Session 1)
English

This discussion begins with the question “What gets passed down from one generation to the next?” This topic evolves as the panelists discuss personal, social, and national questions of cultural heritage, such as: How are things passed down? What has been passed to us? And what are we passing down? Having presented this panel at an International Conference in Savannah, the panelists have a refined sense of cultural heritage topics and related issues. Topics covered include abuse, race, ideology, pop culture and more. This presentation is relevant to anyone interested in literature, culture, or social responsibility.

Irene Ryan - KCACTF

Erin Crouch
Mentor: Tracy Callahan

Oral Presentation (Session 1)
Theater

This last week I had the opportunity to go to Los Angeles, California to compete in the regional Irene Ryan scholarship auditions for actors. During this trip I presented a scene to a panel of adjudicators along with many of my peers from region 8. After our scenes were over we were taken to a room to hear feed back from hand selected respondents. It was an amazing experience in which I learned a lot about what it is like to audition on a professional level. On this trip I was given the opportunity to see fellow actors and technicians from around the country working on our craft. I benefited from viewing there work and participating in the festival.

The Influence of the LDS Religion on Selecting a Romantic Partner

Morgan Drean, Stephanie Lloyd, Breann Johnson,
& Brittany Szymanski
Mentor: Colleen Packer

*Poster Display 18
Communication*

On WSU Confessions, it is not uncommon to read postings about the influence of the Church of Jesus Christ of Latter Day Saint (LDS) religion in all aspects of student life. Many students on the Weber State University campus are part of the LDS religion and choose romantic partners that share their same beliefs and values. This study explores the extent to which the LDS religion influences the choice of a long term partner. Grounded in the theoretical foundations of the Social Identity Theory, this study utilizes quantitative and qualitative methodologies using survey data and thematic content analysis of open ended questions. Findings suggest that LDS people are likely to pursue a long term relationship with other members of the LDS faith, whereas non LDS people are not. These results suggest that because the dominant religion in Utah is the Church of Jesus Christ of Latter Day Saints, that religion does influence people's decision when selecting a long term partner.

Are Dining Service Campus TextClubs Profitable?

Tiffany Dubbelman
Mentor: Susan Hafen

*Poster Display 20
Communication*

As mobile phones become more popular and as short message service (SMS), or "texting," grows more pervasive, exciting new channels for marketing have been created. One is called "permission advertising," a mobile phone marketing strategy via SMS that creates "text clubs," which individual mobile users can join. This study investigates the patterns of consumer texting behavior and the effectiveness of having a "text-club," permission-based advertising for Weber State University Dining Services. The results show that while there is some correlation between membership of the text club and patronage to the location where a text discount is hosted, the stronger correlation is found between the frequency of texts and membership fluctuation. Results indicate that too many text messages leads to members "opting-out." Also, the content of the text messages has to be tailored to best suit the members' wishes. This study provides some useful insights and implications for mobile marketers and discusses avenues for future research.

Hook-Up Culture: A Qualitative Analysis of Sexual Scripts within Gender and Religious Identities

Sarah Dursteler
Mentor: Colleen Packer

Oral Presentation (Session 2)
Communication

The culture of sex outside intimate relationships including dating scripts and sexual scripts has shifted to one of more ambiguity. Multiple changes in sexual scripts have occurred in the last 50 years with the diversification of types of relationships in which sex occurs, including, a greater acceptance of sex outside of relationships (Gagnon & Simon, 1987). This study is in response to the call for more research on how social identities influence perceptions of sexual interaction (Backstrom, Armstrong, and Puentes, 2012). The purpose of this study is to examine hook-up culture outside of traditional intimate relationships. This study explores the extent of the shift from traditional dating scripts to a culture of hooking up as perceived by males and females that identify with the predominant Latter-Day Saint (LDS) religious culture. Using the tenants of social exchange and scripting theories this study examined the attitudes of males and females. Transcripts from four same gender and religion focus groups and 100 open-ended survey responses provided data for analysis. The constant comparative method (Glaser and Strauss, 1967) provided the means by which to analyze data within emergent categories. One open-ended response question was reviewed to assess content theme analysis. The constant comparative method indicated distinct contrast of perceptions of sexual intimacy between males and females. Findings suggest that there are distinct differences between male and female and LDS and non-LDS attitudes about and perceptions of hook-up culture. These results are consistent with previous research indicating that hooking-up can be a functional strategy used to shift focus from traditional intimate relationships to more academic and professional goals.

Wildcat Nation

Militia Earl
Mentor: Susan Hafen

Poster Display 17
Communication

This is a creative visual representation of research conducted with local businesses offering a Weber State University student discount. Research involved canvassing businesses near campus, attending meetings with Ogden City's department of Community and Economic Development, pitching the idea at the 25th Street organization meeting, and receiving information from students who were aware of discounts. Prior to conducting formal research, I found only seven businesses offering a student discount. By soliciting business owners and enlisting the help of students already utilizing other discounts, I compiled a list of 25 businesses in the Ogden area offering student discounts. My creative visualization is a graphic cartoon map, poster size, showing the area of Ogden and the location of each business that offers a student discount, the amount of the discount, and any time constraints such as discounts only offered on Wednesdays. The poster design will include a cartoon representation of these businesses and there location. Information will also be provided outlining my methods of research.

Hair & Makeup Design for “Of Myth & Mud”

Karrie Freeman

Abstract Mentor: Catherine Zublin

Poster Display 44

Performing Arts

Of Myth & Mud Hair/Makeup Design by Karrie Freeman
Of Myth & Mud tells the story of Pandora and her adventure opening the box and releasing an assortment of mythical creatures. In this story, all the creatures we meet are women who have been released to teach Pandora about an experience she will have as a woman throughout her life. With characters like a guacamole eating selkie, a soon to be wed dragon and a phoenix who burns houses down we had to use hair and makeup that hinted at mythical and magical creatures while still allowing the audience to know that they are women having experiences that women have throughout their lifetime. The goal of my hair and makeup design was to turn each actor into a creature with subtle hints, using modern, avant garde makeup and hair styles. My challenge was to make the creatures look mythical and ethereal while still making them relatable women. As part of the design concept the design team decided not to use literal pieces to show what creatures they were. For example, we didn't want the unicorns to have horns, the phoenix to have a beak, or the sphinx to have wings. Instead I used makeup and hair styles that reflected the characteristics of those creatures. My designs are inspired by the elements. Earth, water, sky, and fire. Each character relates to one of these elements and I used lines, colors and textures of these in each of the hair and makeup designs. Pandora is born of the mud so her design focus came from the earth. The dragon is constantly burning down the village where she lives so her focus was naturally fire. The young unicorn loves running in the night and having the wind hit her as she runs, so her inspiration came from the night sky and the northern lights. Pandora could represent Mother Nature while the other creatures make up the other elements.

Utah's Printed Media's Representation of Marriage Equality

Karlee Jensen

Mentor: Colleen Packer

Oral Presentation (Session 1)

Communication

Same-sex marriage has become a hot-button issue in the state of Utah since Judge Richard Shelby overturned Utah's Amendment 3 in December of 2013. With responses to the overturning and the state's subsequent appeal varying, a question to note is how such events are being portrayed by the printed media within the state. The purpose of this study was to examine the differences in coverage featuring same-sex marriage between the Deseret News, which is owned and operated by The Church of Jesus Christ of Latter-Day Saints and the privately owned Salt Lake Tribune. A content analysis of both newspapers following historic dates regarding same-sex marriage (i.e. the passage of Amendment 3, same-sex marriages passage in Massachusetts, the Supreme Court's striking down of Defense of Marriage Act) was used to determine differences in news coverage. Due to the longstanding tradition within the LDS church in crusading against marriage equality, it is unsurprising that the Deseret News did not feature same-sex marriage as prominently or as positively as the Salt Lake Tribune.

Relational Dialectics Applied to Pre and Post-Divorce Relationships

Adam Jones
Mentor: Colleen Packer

Oral Presentation (Session 2)
Communication

While a number of articles have examined the theoretical perspective of relational dialectics within existing relationships, this article focuses on the change in the nature of relational dialectics as applied to pre and post-divorce relationships. The article examines the idea that while the overall dialectic does not change, the communication surrounding that dialectic changes drastically. Based on findings from interviews of a small-scale qualitative research project, the changes in dialectical tensions are discussed in depth.

Role Models Within Families

Ashley King
Mentor: Colleen Packer

Poster Display 21
Communication

With today's busy society, parents often don't spend as much time with their children as they have in the past decades. As a result, parents as role models may not be as prevalent as it has been in the past. The purpose of this study is to explore role models within the family unit. Drawing on the theoretical tenets of symbolic interactionism (Mead, 1934), fifty surveys were studied using descriptive statistical analysis as a research methodology. Findings suggest that mutual respect and time spent with a family member lead to a greater likelihood of that person being perceived as a role model. In a world where the quality of family time and mutual respect may be decreasing, these findings suggest that we may need to re-evaluate our priorities.

Human & Sex Trafficking and Forced Labor

Aundrea Peterson

Mentor: Susan Hafen & Sarah Steimel

*Oral Presentation (Session 2)
Communication*

This video project was created after researching human and sex trafficking and forced labor in the United States and the around the world through statistics published by U.S. Department of State, United Nations, Washington Times, Not For Sale Campaign and Women's Funding Network. The video uses scenes and visuals to create an emotional response from viewers on YouTube and social media sites, where it was posted. I also conducted a survey to learn what Weber State University students know about human and sex trafficking and how the products they use are tied to companies that financially support these practices. This survey can hopefully impact students' understanding of how their own buying habits can affect horrific human rights violations.

Charm Dramaturgy

Clayton Price

Abstract Mentor: Jenny Kokai

*Poster Display 48
Theater*

During fall of 2012 Weber State University produced a thrilling modern play about a rather unknown American writer of the 1800's Margaret Fuller. Charm is all about this woman, which few students know about, and those who she was closest with during her life. The men that are included in this work are, Ralph Waldo Emerson, Nathaniel Hawthorne, Henry David Thoreau, and Orestes Brownson. While the playwright Cathleen Cahill added a certain amount comedic anachronisms the events within the play are based in history, thus allowing the audience and the department to grow in an understanding of these persons enlightening influences in American history. The department of theatre selected myself, Clayton Price, to serve as the dramaturge for this remarkable play. Accepting this responsibility allowed me to serve many within the department such as the actors, director, and designers. The director, Tracy Callahan, came to me to discuss her visionary concept for this production; and thus she enlisted me in researching. We spent months collecting and reflecting all of the hidden knowledge with in the play. All of this was to make sure that the director had enough information to support her concept. After obtaining all the necessary information I was able to distribute it to the actors and designers, allowing them to see the vision of the director. Upon completion of this initial research I was able to begin putting together detailed biographies for each of the characters in the production. These biographies were given to the actors in their full length, as well as the audience in a more condensed form. All of my research led to the building of an educational packet that was distributed to local high schools to promote the attendance and education of students; as well as a lobby display giving audiences an idea of what the production contained before they entered into the theatre.

The Critical Theory of Communication in Organizations and National Patient Accounting Services

Andrea Prigmore
Mentor: Sarah Steimel

*Poster Display 16
Communication*

The purpose of this paper is to take a deep look at the structure of the National Patient Accounting Services department (PAS) of Ogden Regional Medical Center. As an employee of PAS I felt that the Critical Theory of Communication in Organizations was relevant to the structure of this organization. I applied the concepts of this theory to evaluate the organizations methods of communication between upper management and entry level employees. To do so I provided a brief description of the history of the organization. Next, I provided descriptions of ten interviews that I conducted with employees; each interview lasted between ten and twenty minutes. Last, I applied the main concepts of the theory to the organization. What I found through my study was that many of the employees there identified concepts of the theory happening to them, often without even being aware of the ideas of the theory. Many were willing to give up some control of their lives for the sake of the familiarity they had with their jobs. It would appear, based on my own study at least, that the organizations that we are involved with are encroaching more and more on our everyday lives.

The Parental Technology Trap: Has it Caught You?

Taylor Proctor
Colleen Packer

*Poster Display 19
Communication*

Many people believe that children's use of social media hinders communication in the family. Yet, what happens when a parent uses social media? The purpose of this study is to explore the impact of parental use of social media on the family. Grounded in the theoretical tenets of Watzlawick's Interactional View, fifty surveys were analyzed using descriptive statistics as a methodological framework. Results suggest that the impact of parental use of social media can be positive or negative depending on frequency and purpose of use. These findings hold that moderation in the use of social media maintains more positive familial bonds.

Divulging Emotion Through Realism

Rachel Rigley
Mentor: Jason Manley

Oral Presentation (Session 1)
Visual Arts

My project, “Divulging Emotion Through Realism” has explored innovative techniques in figure sculpture to create a life-sized, life-like representation of the female figure. The female figure will be in a resigned pose, laying flat against the wall, pinned by what appears to be a spear through her side. My work will portray the human body in a visual narrative that symbolically expresses a deep and human feeling of helplessness, confusion, struggle, and resolve. I have learned high-tech casting and mold-making methods to work in a style of artwork known as hyper-realism, or an exact recreation of a real-life thing, which techniques will be shared in addition to the art product. There is a presence and emotion in hyper-realism sculpture that is very important to communicating ideas in art, which I will analyse in my own presentation of my art piece.

The Plain Princess Costume Design

Amanda Shaffer
Mentor: Catherine Zublin

Poster Display 50
Theater

When designing for a musical such as *The Plain Princess*, one must address the issue: How do you make an actress go from plain to beautiful with the help of costumes? This obstacle was one of the many I was challenged to overcome in my experience as the costume designer for Weber State’s production of *The Plain Princess*. As a student designer on this project, I had the opportunity to learn what it means to collaborate with fellow designers in creating a cohesive vision to appear on stage. Working with an original script written and directed by Jim Christian and music by Tom Clark, we were able to use color, lines, and texture to create a world reminiscent of both the folk-lore and fantasy of fairy tales. *The Plain Princess* is an original musical about a young princess who lives a selfish, spoiled life, but unlike most princesses is absolutely plain. After a disastrous birthday party full of temper tantrums, the princess is sent by her loving parents to live a modest life with a poor widow and her five daughters. Through this experience, the princess learns to be kind, lovely, and that outer beauty reflects inner beauty. I used these elements of color, texture and lines to establish a difference of class systems within the musical, but also a cohesion between families and relationships through the musical. It allowed the audience to travel between two different places, families, and classes within this world. One of our tasks as designers was to make our actress portraying Princess Esmerelda transform from someone plain to someone beautiful. Collaborating with the hair and makeup designer, we used colors in fabric, hair, and makeup to achieve this shift. At first we made her appear washed out and without color, but by the end of the production, she had warm fresh color and fabric that complimented her skin.

Bringing Awareness: An Analysis of the Representation of Pit Bulls in the Media

Kirsten Stuart
Mentor: Ann Bialowas

Oral Presentation (Session 1)
Communication

This project is designed to address the representation of pit bulls in the news media. The research will begin with a contextual analysis of newspaper articles that were written pertaining to pit bull attacks during a designated time frame. Secondly the research will compare the content of each article with the factual data of each case that is analyzed. The goal of the research is to analyze the results and see what if any bias there is in the media regarding pit-bull attacks by researching which articles did not report the actual factual data and if “Pack Journalism” occurred in these cases.

Shelby Thomas-KCACTF

Shelby Thomas
Mentor: Tracy Callahan

Poster Display 45
Performing Arts

I was invited to participate at the Kennedy Center College Theater Festival Region VIII as an Irene Ryan Nominee from my nomination of the role Aixa that I played in Weber State University’s production of *Of Myth and Mud*. I had the opportunity to learn what it means to collaborate with other student actors to make a show come to life on the stage. Using an original script written by Sarah Saltwick, and working alongside director, Jennifer A. Kokai, through many rehearsals, I was able to create a character that had never before been acted or portrayed. We were able to interpret the script to create what Jennifer called, “an adult fairytale.” Using the art of acting and performing, I created a live piece of art that communicated to an audience the story and lives of others. This allowed the audience to travel to a world of fiction and fantasy. My role as an actor in this production was to portray the most important moments of my character’s life, make the audience see what she was like and what her objectives were as a person. The Irene Ryan Scholarship competition allowed me, along with my scene partner, Emily Wells, to take prepared scenes and a monologue to present at KCACTF. There I was given an opportunity to compete and showcase my talents as well as be judged as an actor by other peers and adjudicators. This competition was a great challenge full of hard work and dedication, but I gained experience of my craft on a new level. My time spent at the festival furthered my knowledge of the theatre arts and performing. The grant allowed me to travel to Los Angeles and showcase my workmanship and art alongside my fellow actors and peers from the Western United States.

Sound Design for the Plain Princess

Derek Walden
Mentor: Catherine Zublin

Poster Display 47
Theater

In October of 2013, *The Plain Princess* was originated in the Allred Theater of Weber State University, in a world taken directly out of a bedtime story. My role within the production was to collaborate with my fellow production team of student and faculty members as the Sound Designer to achieve the goal of a fairytale princess feeling. The sound design is happily subtle, with an ambiance of crickets chirping as the King and Queen stand at their balcony, or a soft meadowlark that sings its song whenever Esmeralda learns important lessons, starts to help others, becomes more selfless. Through the use of multiple microphone equalizations for the princess, her voice even takes on a transformation of its own from a harsh cold tone to a warm, rounded, and silky timber when she sings her royal lullaby to cheer up her new friend, Echo. Sound localization plays a part as well, with the meadowlark off and above the characters, or a trumpet fanfare for the arrival of the King and Queen from beyond the meadow gate to create a realistic ambiance of sound for even the youngest viewers. Each of the eighteen actors on stage wears a body mic and are mixed as a choir along with the tones of a harpsichord, celeste, and piano to sing and create the exposition and story of *The Plain Princess*. I have been invited by the Kennedy Center American College Theater Festival to present my design work to panels of professionals and theater arts faculty from across the region. At the festival I will also have the opportunity to attend workshops, make contacts, and gain a greater education in the world of professional Theatrical Design and Management. Most importantly, I will be able to represent Weber State University and the Theatrical Design and Production Quality that has become recognized and applauded through this national festival, and at this region's 46th annual conference.

The Plain Princess, Hair and Makeup Design

Derek Williamson
Mentor: Catherine Zublin

Poster Display 49
Theater

A Hair and Makeup designer's duty is to fill the stage with actors that meet the descriptions of the character. In *The Plain Princess* (written by Jim Christian based on the book by Phyllis McGinley), we set the design elements in a Regency time period. This was a great opportunity to explore with the time period, the silhouette of the clothes, the line in hair, the architecture, the art, etc.. I directed my focus on a very neat and put together feel, based on the research found. There was a great opportunity to explore with braids and curls, and ringlet curls for the women and pulled hair for the men. The King and Queen of the court exemplify this style best. In contrast to the Court, we find a family that has separated themselves from the formalities of the kingdom. Dame Goodwit and her five daughters have long been removed from the society and the norms of the court and for this reason, their hair is far more free. Long braids that frame the face, curls that dance in the wind, and smiles that feel unpolished, but beautiful, separating the two worlds in a distinct way.

Bachelor of Integrated Studies

The Efficacy of a Motivational Imagery Intervention in Distance Athletes

Jenna Deelstra

Mentor: Jordan Hamson-Utley & Lauren Fowler

Oral Presentation (Session 1)

Health Promotion & Human Performance

The purpose of the present study was to explore the impact of facilitative mental imagery training on distance runners. Female (n=20) and male (n=11) athletes, separated by skill level classifications: Collegiate (n=19) and recreational (n=12) completed the Motivational Imagery Ability Measure for Sport (MIAMS) before and after 21 days of mental imagery training. Included in the training were relaxation and breathing techniques followed by guided imagery related to distance running training and competition. Physiological responses collected through galvanic skin response (GSR), skin temperature, and breathing rate were also measured while participants took the MIAMS survey, which asked them to imagine and experience a competition. Multiple one-way analyses of variance (ANOVA) and multiple t tests examining the effects of the imagery training on MIAMS survey responses between collegiate and recreational athletes for motivational general-mastery imagery (MG-M) and arousal imagery (MG-A) were employed. Significance was found in the emotional response evoked and the ease of producing imagery between the two groups. Post-training skin temperature and galvanic skin response (GSR) between the two groups was also significant. These findings support previous research indicating that imagery is a skill that can lead to better emotional control in competitive athletes. More research must be done to better understand the effects of mental imagery training on male and female distance athletes.

The Association Between the Serotonin Transporter Promoter Region Polymorphing and Aggressive Behavior

Daniel Linford

Mentor: Matthew Schmolesky & Barb Trask

Poster Display 1

Bachelor of Integrated Studies

Studies have shown a correlation between neurotic behavior and a functional polymorphism in the promoter region of the gene that code for the serotonin transporter (5-HTTLPR). The short form of the 5-HTTLPR polymorphism has been linked with anxiety and depression (Takahashi et al. 2011). Our study seeks to examine the relationships between this gene and aggressive behavior, and the harm avoidance personality trait. The study was conducted by administering the Buss-Perry Aggression Questionnaire and Cloninger's Temperament and Character Inventory (TCI), to university Students (n=111), and genotyping subjects for the 5-HTTLPR polymorphism by polymerase chain reaction (PCR) amplification of buccal cell DNA and electrophoresis gel. Our results showed a significant two-tailed correlation between total aggression and total harm avoidance ($r=.250$, $n=111$, $p=.008$). Males were lower in total harm avoidance ($M=10.62$, $SD=8.011$) than females ($M=18.35$, $SD=7.017$); $t(109)=-5.152$, $p < .001$). Total aggression was not significantly affected by sex, but males scored higher than females in both physical aggression ($M=20.57$, $SD=9.39$) vs. ($M=15.41$, $SD=7.32$); $t(109)=3.15$, $p =.002$) and verbal aggression ($M=17.63$, $SD=7.74$ vs. ($M=14.29$, $SD=5.63$); $t(109)=2.57$, $p =.012$). In the sample of participants that have been successfully genotyped to date (n=16), no significant relationship with the aggression and TCI variables was found.

Developing an Intervention for Post-Concussion using Baseline Data: Sleep and Activity Levels

JoLin Petersen

Mentor: Jordan Hamson-Utley

Poster Display 37

Health Promotion & Human Performance

Context: Current post-concussion treatment is highly variable across sport settings and within the NCAA. A common focus of treatment is to minimize symptoms, which correlates with RTP evaluation. Common symptoms include visual, headaches, difficulty sleeping. Another common theme in post-concussion care is limiting activity; resting following concussion has been correlated with symptom resolution. Objective: Determine baseline data in a healthy college-aged population including sleep quality/quantity, average daily-activity on a college campus and at rest confined to a home setting. This data aids in developing a post-concussion treatment protocol by quantifying "rest" as a step count and by examining the average sleep quality that college-students achieve. Design: Observational, gathering of normal daily activity and sleep patterns. Setting: College campus, Ogden, Utah. Participants: Nineteen (n=16 females; n=5 males) healthy college-aged participants (26.7+/-6.2 years; 169.5 cm; 78.2+/-25.2kg) with no current concussion. Results: Average daily-activity for college-aged participants was 6781.5 25+/-48.17 steps. Average daily-activity when confined to the home was 662.8+/-48.5 steps. Average sleep quantity was 7.12+/-0.88 hours. Average restlessness at night was 26.5+/-6.10 times awakened. Conclusions: Activity levels of college students is an important step in developing a comprehensive post-concussion care plan. Assessing the quantity/quality of sleep may also be correlated with symptom resolution.

The Link Between Zonulin and the Development of Autoimmune Disorders, such as Celiac Disease

John Stanger

Mentor: Don Davies

Poster Display 26

Chemistry

Zonulin is a newly described biological molecule found to play a key role in the interworking of the gastrointestinal tract of patients who suffer from Celiac Disease (CD). The prevalence of CD in the U.S.A. and other developed countries continues to increase, which has sparked interest to discover how patients acquire autoimmune disorders. Zonulin's role in CD has helped researchers formulate and test new mechanisms in how patient populations develop CD and other autoimmune disorders such as Type 1 Diabetes (T1D), Multiple Sclerosis (MS), and Ankylosing Spondylitis (AS). Zonulin deregulates gut permeability in CD, T1D, MS, and AS through a series of receptors with both genetic and biological factors. In this "leaky gut" model drastic immune responses have been observed. A literature review has been used to answer the question "How are the autoimmune disorders CD, T1D, MS, and AS related, if at all?" The progress of this project is a secondary research paper to be finished April 2014. Results obtained from literature conclude that there is sufficient evidence that the Zonulin pathway link several autoimmune disorders together into how patients become susceptible to them. This is unique from previously described mechanisms such as the Bystander Effect and Molecular Mimicry.

John B. Goddard School of Business & Economics

Did You Kiss Him Mom?: A Qualitative Analysis of Single Mother Dating and its Impact on her Adolescent Children

Stacey Truax
Mentor: Colleen Packer

*Poster Display 22
Communication*

More and more frequently adolescents live under the circumstance of having a single mother who is dating at the same time they are. The purpose of this study is to explore the effects of single mothers dating has on their adolescent children. Using family systems theory as a foundation for research, this quasi-ethnographic study includes 5 in depth interviews of family members who had single mothers who dated during the participants' adolescence. Informal interview transcripts were analyzed using thematic content analysis as a methodological framework. Results suggest that there are both positive and negative effects on the adolescent child. Findings also revealed that consistency with rules and expectations of dating behaviors must have mutual respect in order to sustain a positive relationship.

Jerry & Vicki Moyes College of Education

Adult Role Models for Youth

Ashley Davis

Mentor: Geri Conlin

Poster Display 25

Health Promotion & Human Performance

Students are more physically active when provided with a role model for fitness. (Senne et al., 2006) The investigation into graduate physical education students found students believed their role as a physical education teacher was to be a physically active role model, boost self-esteem, and present lessons to engage all students in class. (O'Bryant, O'Sullivan, & Raundesky, 2000) Physical educators who appear to be more physically fit act as a better role model. (Melville & Maddalozzo, 1988) One way that physical education teachers can demonstrate being an active role model is through being physically active with their students. In this study we see the affects of a four-week physically active adult role model intervention on students' recognition of an adult role model of healthy activity. Findings suggest recommendations for secondary teachers in helping their students be more physically active.

The Impact of Integrating Service Learning in an Elementary Special Education Classroom

Tori Lybbert

Mentor: Melina Alexander

Poster Display 55

Special Education

Service Learning is an educational strategy where students are given the opportunity to apply skills in a service setting (Furco, 1996). Service learning offers students the chance to increase their skills while giving to their communities (Scott, V. G., 2006). The use of service learning as a pedagogical strategy has been researched extensively at the college level. It has been shown to have a positive impact on both faculty/teacher behavior and student outcomes. Service learning has less research at the K-12 level but has been shown to have similar effects. Seitsinger (2005) states that teachers who implement service learning regularly are more apt to implement standards based instructional practices. In addition teachers engaged in service learning motivate students and help them make meaning of experiences (Stewart, 2008). General education K-12 students engaged in service learning are influenced positively in many areas including social development, behavior, civic engagement, and academic outcomes (Billig, 2000). Many researchers have discussed the need for service learning when working with students with disabilities (Carter, Swedeen, & Moss, 2012). In fact there has been a call for preparing pre-service special education teachers with the pedagogical tools to implement service learning in their future classrooms (Mayhew & Welch, 2001). While special education teachers may be trained in using service learning techniques, few have conducted research to show its utility. Therefore there is little research to show the effectiveness of service learning to increase special education students' academic skills. The purpose of this case study project is to determine the utility of service learning as a pedagogical method, to increase mathematics performance in students receiving IDEA services in a resource classroom.



Dr. Ezekiel R. Dumke College of Health Promotions

Toothbrush Sanitization: A Comparison of Two Methods

Chelsea Burr, Kelsey Adams, Kristen Linford,
& Hailey Fawson
Mentor: Frances McConaughy

*Poster Display 29
Dental Hygiene*

Bacteria are transferred to a toothbrush each time it is used. While not all oral bacteria are pathogenic, bacteria related to caries, gingivitis and periodontitis are transmissible among toothbrushes in close contact. Toothbrush care and maintenance is an important consideration in sound oral hygiene (ADA, 2011). The purpose of this study was to compare the ultraviolet light and microwave to determine which sanitization method was most efficient in reducing bacteria on a toothbrush. Research participants consisted of 45 individuals assigned to experimental or control groups. Each participant was given a toothbrush and instructed to brush for one week. Ten unused toothbrushes underwent analysis to assess pre-existing bacterial contamination. Fifteen of the 45 sample toothbrushes were not sanitized, serving as a control. The experimental toothbrushes were cut in half, sanitized, plated on sheep blood agar, and incubated for 24 hours. Data was analyzed to determine the effectiveness of each sanitization method and whether gram-positive or gram-negative bacteria remained. Results are expected to show a greater reduction in bacteria from microwave sanitization. All lab work was completed with the help of the Medical Lab Science department.

Risk Assessment for Periodontal Disease

Chenylle Corbett, Kynzie Atkinson,
Nicole Diquattro, & Caitlyn Capener
Mentor: Frances McConaughy & Susan Alexander

*Poster Display 30
Dental Hygiene*

The prevalence of periodontal disease in the adult population has become a special concern because of the emerging link between periodontitis and systemic conditions such as stroke, diabetes, and atherosclerosis (Nield-Gehrig & Willmann, 2011). Traditionally, clinicians have used subjective risk assessment measures, including bleeding on probing and other signs of inflammation to confirm periodontal disease status. However, these measures are limited because they only offer information about the history of periodontal disease for the patient, rather than information about the presence of disease, the response to therapy, or a person's risk for disease (Giannibile, 2009; Nabors, 2012). The purpose of this project was to assess the correlation of traditional risk assessment measures with a more objective assessment measure of periodontal disease. Thirty clinical patients, with one or more systemic risk factors for periodontal disease, were included in the study. Salivary samples, from clinical patients, were processed by an outside laboratory for the presence and risk level associated with known periodontal pathogens. Results will be analyzed to determine the relation between traditional and salivary risk assessment measures for periodontal disease. It is expected that salivary risk assessment measures will provide more definitive information related to a patient's risk for periodontal disease.

Variance of Toxin Producing Clostridium Botulinum in Utah Honey

Tamara Fox & Laura Tucker
Mentor: Matthew Nicholaou

*Oral Presentation (Session 2)
Medical Laboratory Sciences*

Tamara R. Fox, Laura J. Christensen (Dr. Matthew J. Nicholaou), Department of Medical Laboratory Sciences, Dumke College of Health Professionals, Weber State University, Ogden UT, 84408-3905 Clostridium botulinum has been implicated in cases of infant botulism across the United States. It is recommended that infants under the age of one year not be fed honey because of the presence of C.botulinum spores. The goal of this project is to determine whether honey produced in small and large apiaries in Utah contain varying amounts of toxin producing C. botulinum. Honey samples will be collected from hives maintained in Utah and tested for the presence of toxin producing strains of C. botulinum. Samples will be dissolved and centrifuged to isolate the spores and then superheated to release the DNA. Testing will then be done through a multiplex polymerase chain reactions (PCR) using primers specific for 16s rRNA, Clostridia species, and toxins A, B, E, and F. The presence and type of toxin producing Clostridia species will be compared with a Chi-Squared Test of Independence. Research will be completed by February of 2014 and we expect small apiaries will have a lower frequency of toxin producing C. botulinum strains than large apiaries and that toxin phenotype will vary between the two groups. The results will increase understanding on the variance of C. botulinum in Utah honey and will contribute to further research on this topic.

Human Papillomavirus Risk Awareness Among Dental Hygiene Professionals

Katie Gee, Kimberly Karpowitz, Julie Palmer,
& Courtney Bostwick

Mentor: Frances McConaughy & Shane Perry

Poster Display 33

Dental Hygiene

The majority of oral cancers have previously been related to tobacco and alcohol use and dental professionals are well versed in screening practices for these cancers. However, traditional oral cancer screenings are of limited value in detecting HPV-related oral cancer that now requires a different approach (Duval, 2013). While the prevalence of tobacco/alcohol related oral cancer has dropped in recent years, HPV-related oral cancer is increasing. Because of the differences in oral cancer screening protocols, the purpose of this project was to assess dental professionals' knowledge of HPV-related oral cancer and their knowledge of screening protocols for HPV-related oral cancer. A survey research design was used in this study and targeted Registered Dental Hygienists (RDH) and members of the Utah Dental Hygienists' Association. Results will be analyzed to determine professional's knowledge of HPV related oral cancer and their screening practices. The results are expected to show that additional education is needed to heighten the awareness and procedures needed to screen for HPV-related oral cancer among dental professionals.

Multiple Dimensions of Fitness - Predictors of Bone Mineral Density in Middle-Aged Women

Brady Hansen

Mentor: Scott Wright

Oral Presentation (Session 2)

Medical Laboratory Sciences

The purpose of this study was to evaluate the relationship between measured physical fitness and bone mineral density (BMD) of the hip and spine using a cross sectional design. The sample population consisted of 240 women ages 25-49. Physical fitness was indexed with the bench press using 35% of body weight, sit-ups in 60 seconds, best jump, VO2 max using a maximal graded treadmill test, and an average composite Z-score of the fitness tests listed above. Hip and spine BMD were assessed using dual energy X-ray absorptiometry. The data analysis was done with linear regression and analysis of variance with weight controlled statistically. The association between hip BMD and bench press ($F=5.3$, $P=0.0219$), sit-ups ($F=7.5$, $P=0.0065$), best jump ($F=11.6$, $P=0.0008$), VO2 max ($F=9.3$, $P=0.00251$), and the composite Z-score ($F=16.1$, $P=$

Effects of Magnification and Lighting on Improving Oral Health

Veronica Laughter, & Alex Hadley
Mentor: Frances McConaughy

Poster Display 35
Dental Hygiene

The purpose of this research is to evaluate the effects of magnification and lighting on the oral health of adults with decreased vision. As people age, their visual acuity declines, especially for those who are 40 and above. This is a concern for dental hygienists, not only for their own eyesight, but also for many of their patients' and their ability to perform good oral hygiene techniques. The purpose of this research is to evaluate the effect of incorporating a lighted magnifying mirror in oral hygiene care for a group of patients, aged 40 and above. This study used adults from Weber State University Dental Hygiene Clinic. The requirements for this study include: 40 years old or older, with periodontal disease (including gingivitis) and decreased close up vision. We will measure their Bleeding Free Index (BFI) & Plaque Free Index (PFI) which we will use as their baseline data. They will be given disclosing tablets, 10X zoom lighted magnifying mirrors, and Oral Health Instructions. There was great improvement in the patients' BFI and PFI due to better lighting and magnification. The patients were able to detect where plaque accumulates on their teeth and how proper brushing (angles and methods) definitely improves their oral health. In conclusion, the effect of magnification and lighting improves oral health. Patients with decreased visual acuity are able to visualize plaque on their teeth and are able to remove it with proper tooth brushing and flossing techniques.

Patient Oral Hygiene Effectiveness and Acceptance of Using Toothpaste Containing Cranberry Extract

Amanda Maw, Lina Leung, & Kara Riley
Mentor: Frances McConaughy & Stephanie Bossenberger

Poster Display 28
Dental Hygiene

Dental caries is one of the most prevalent diseases in the world affecting both children and adults (Wilkins, 2012). A review of the literature found studies that examined the topical effect of cranberry toothpaste on the biofilm formation. Specifically, cranberry extract have been shown to interrupt the pellicle formation, resulting in an overall reduction in bacterial levels (Yamanaka, et al., 2004). However, the majority of these studies were in-vitro studies and no studies were found that examined the clinical significance of patient use or acceptance of toothpaste with cranberry extract. The purpose of this project was to examine patient oral hygiene effectiveness and their acceptance of using toothpaste containing cranberry extract. A commercially available toothpaste was used in this study. Measures of oral hygiene, specifically a plaque index (PI) and bleeding index (BI) were used as objective measures to assess oral hygiene effectiveness. Participants were also asked to complete a short survey both pre & post data collection regarding their oral hygiene habits and acceptance of the toothpaste. Results are expected to show an improvement in measures of oral hygiene effectiveness (PI and BI scores) and favorable patient reaction to using toothpaste with cranberry extract.

Comparison of Pathogenetic and Drug Resistance of Staphylococcus Aureus Found Among Weber Students

Ahmed Mohammed, Richard Scott, & Michael Smith
Mentor: Matthew Nicholaou

Oral Presentation (Session 2)
Medical Laboratory Sciences

Staphylococcus aureus is a bacterium that can cause life threatening infections and some strains show high-resistance to antibiotics. In our study, we will compare drug resistance patterns of S. aureus samples collected from Weber State students, where research shows at least 20 percent of individuals will be carriers of the bacteria. These samples will be collected from nasal passages where S. aureus is commonly found then cultured using clinical microbiology techniques. Pathogenicity will be determined using Polymerase Chain Reaction (PCR) to differentiate our samples at the genetic level, confirming if any are Methicillin-Resistant S. aureus (MRSA) through detection of the mecA gene. Furthermore, we will test our samples to look for the luk-S and luk-F genes responsible for the production of the cytotoxin Pantone-Valentine leukocidin (PVL). Antimicrobial resistance patterns will be determined using Minimum Inhibitory Concentration (MIC) panels commonly used in clinical laboratories. Based on our findings, the S. aureus isolates will be categorized into three groups: high-resistance—resistant to 5 or more drugs; moderate-resistance—resistant to 2-4 drugs; and low-resistance—resistant to less than 2 drugs. We expect to find those with prolonged exposure healthcare settings to be carriers of the more pathogenic strains.

Oral Health Knowledge and Reported Oral Hygiene Behaviors in a Low Income Population

Cheryl Moore & Wendy Leavitt
Mentors: Frances McConaughy, & Susan Alexander

Poster Display 31
Dental Hygiene

The 2000 Surgeon General's Report, Oral Health in America, evaluated the importance of oral health issues nationally (HHS, 2000). Many groups have been identified as having unmet oral health care needs and poor oral health including populations of lower (SES) (Williams, Whittle, & Gatrell, 2002). There are a number of consequences of poor oral health. Lewis (2010) and his colleagues stated we still "lack insight into low-income individuals' experiences and beliefs surrounding oral health" (p 518). The purpose of this study was to address this lack of insight by examining the barriers, knowledge, and oral hygiene practices of a group of low socioeconomic status (SES) families. Additionally the study was conducted to determine whether or not an increase of oral health knowledge would increase oral hygiene behaviors. Approximately 50 adults from an identified low income population were recruited to participate. The design of this study included a pretest, an intervention, and a post-test. The pretest and post tests assessed the participant's knowledge and habits. An oral health education program was provided to the participants. The results are expected to show that the participants gained knowledge from the oral health education program and improved behaviors as evidenced by improved quiz scores.

Sealant Retention: An Evaluation of Weber State University Dental Hygiene Sealant Clinic

Whitni Nye, Ashley England, Brandi Sibert,
& Lexi Van Wagoner

Mentors: Frances McConaughy
& Stephanie Bossenberger

Poster Display 36
Dental Hygiene

Sealants were developed to prevent caries by creating a barrier from bacteria. Studies show that more than 90% of new carious lesions are developed in pits and fissures (Barrow, 2006). Sealants placed in pits and fissures, using correct placement techniques, have higher retention rates and are successful in protecting against future caries. Frequently, sealants are placed with no follow up of retention rates to evaluate the success of the sealants or the overall effectiveness of the health care program. The purpose of this study was to evaluate the retention rate of the sealants placed during the WSU Dental Hygiene community sealant clinics for the 2012 & 2013 school years. This study used visual and mechanical means to assess overall retention of sealants. Further, this study examined the retention of maxillary versus mandibular sealants. Sealants were evaluated according to the following scale; partially retained, fully retained, missing, or failed. All participants were examined by one of the student researchers and sealant retention was recorded. This study provides valuable retention rate information about this program for school aged children in Ogden. Results are expected to show a retention rate of at least 85% after one year and 70% after two years.

Childhood Stress: The Coping Behaviors of Stress on America's Youth

Ryan Rigby & Katie Rigby
Mentor: Colleen Packer

Poster Display 51
Nursing

Childhood stress is linked to depression, low self esteem, and a variety of health problems. Using Schutz' Interpersonal Needs Theory, this research examines the communication behaviors that pre-adolescents use to relieve stress. The original research contained in this project includes data collected from a survey given to fifty pre-adolescents in the northern Utah area. Surveys were analyzed using frequency and percentage distribution tests to identify common communication behaviors. Results suggest that modern pre-adolescents turn to media use and isolation over face to face interaction as methods to cope with stress. These findings may imply a link to future negative communication skills within a family.

Prevalence of ABO Blood Types and Diabetes Mellitus Type I

Tyler Rushforth, Joshua Lloyd, & Hayley Steed
Mentor: Janet Oja

Oral Presentation (Session 2)
Medical Laboratory Science

Studies have shown that an individual's ABO blood type can influence one's likelihood of certain diseases. Our research will be done to determine if there is a correlation of an individual's ABO blood type and risk of type I diabetes mellitus. Finding a correlation would be beneficial by providing insight into which populations are at greater risk for becoming diagnosed with diabetes. This could help lead to prevention or earlier detection of type I diabetes mellitus of future patients. To accomplish this research, we will obtain 100-150 blood samples from individuals that are known type I diabetics ranging in age from 6-25 years. We will use gel technology to determine the forward ABO blood type. Using statistical analysis, we will compare our sample of ABO blood types among type I diabetics to a control group of non-diabetics of Weber State students. We hope to find a prevalence of blood types A and B among diabetics compared to the control group, which would be a basis for further research.

Use of Common Household Desiccants as a Poison Ivy Block

Danile Shallbetter & James Mauchley
Mentor: Mathew Nicholaou

Oral Presentation (Session 1)
Medical Laboratory Sciences

Contact dermatitis due to contact with members of the Toxicodendron family (including poison ivy and poison oak) is a major problem for those who live in forested areas around the world. A chemical known as quanternium-18-bentonite is a known preventative agent in pretreatment. This acts as a desiccant, absorbing any fluid it comes in contact with, including the oily urushiol which is the causative agent in contact dermatitis. All around us however are many desiccants that have the exact same absorbing capabilities. Is it possible for another more accessible desiccant to have similar effects of absorption of urushiol oil? Our plan is to test the absorbency of common household desiccants against that of quanternium-18-bentonite, and test any residual liquid for the presence of urushiol by GC analysis to find if another desiccant can prove as effective as the known treatment.

Outcomes and Complications of Capsule Endoscopy in a Community Gastroenterology Practice

Jordan Smith & Chad Gonzales
Mentor: Barb Trask

Oral Presentation (Session 2)
Zoology

Capsule endoscopy (CE) is used to diagnose small bowel pathology and has favorable diagnostic yield when compared to other available technologies. Primary indications for CE include obscure gastrointestinal bleeding in adults, suspected Crohn's disease, and small bowel tumors. Between 2007 and 2012, 265 patients underwent CE testing in a community GI clinic. A retrospective chart review of these patients was conducted. Electronic and paper medical records were analyzed for demographic information, CE indications, pertinent findings and interventions. Sub-group analysis was performed. CE was performed for evaluation of iron deficiency anemia in 65.7% of patients, occult GI bleeding (39.3%), rectal bleeding (31.7%), abdominal pain (20.7%) and diarrhea (18.11%). Overall diagnostic yield was 82.3%. The most common findings were gastritis (34%), artery venous malformations (AVMs) (19.9%), small bowel ulcers or erosions (9.9%) and miscellaneous (18.5%). 17.7% of studies were normal. Relevant pathological findings were identified in patients with iron deficiency anemia (72.9%), occult GI bleeding (76.9%), rectal bleeding (76.2%) and abdominal pain (80%). Complications due to capsule retention occurred in 3 patients (1.1%) all of whom had Crohn's disease with small bowel strictures, ulcers or erosions. The capsule passed spontaneously in 2 patients by 3 weeks. The capsule was retained for 3 months in the other patient with known Crohn's and was removed by surgery.. Wireless CE in community GI practice is a useful study in evaluation of small bowel pathology with high diagnostic yield. CE is safe with very few complications. Capsule retention was infrequent occurring in only 1% of patients. Abnormally slow capsule transit occurred in 5% of studies and impacted completeness of the study.

Hospital Cost Efficiency and Compliance with Laboratory Algorithms

Jace Stoker, Derek Smith, & Kelsey Johnson
Mentors: Scott Wright & Matthew Nicholaou

Oral Presentation (Session 1)
Medical Laboratory Sciences

America has the highest healthcare costs in the world, yet not necessarily the best quality. In 2012 the average American spent \$21,000 in healthcare cost, a large portion of which could come from unnecessary laboratory testing ordered by physicians. Our research will evaluate the dollar amount spent on unnecessary laboratory reflex testing in McKay Dee Hospital. A laboratory algorithm is a process used to indicate additional testing on abnormal results, which is called reflex testing. Test result data on common reflex tests (e.g. urine with microscopic examination and thyroid stimulating hormone/T4) will be collected from the Laboratory at McKay Dee Hospital. These data will be used to assess the additional cost of performed reflex testing when not warranted by laboratory algorithms. The costs will be stratified by test volume, reagent cost, and paid technical time. We hypothesize the results will show that unnecessary reflex testing is a substantial financial burden on healthcare costs in the Laboratory at McKay Dee Hospital.

Diabetes Risk Assessments

Summer Wallace, Valerie Van Velkinburgh,
& Madison Howard
Mentors: Frances McConaughy & Shane Perry

Poster Display 34
Dental Hygiene

Project Title: Diabetes Risk Assessment Madison Howard, Summer Wallace, and Valerie VanVelkinburgh Department of Dental Hygiene, College of Health Professions Undiagnosed diabetes is a national health concern and data from the American Diabetes Association (2011) indicates there are nearly 7 million people with undiagnosed diabetes. With the advent of diabetes risk assessment procedures, dental health care providers have been identified as a resource to provide diabetes risk assessment procedures for patients. This is due, in part, to the relative risk between diabetes and periodontal disease (Borrell, 2007). However, the review of the literature found little evidence that this type of screening is actually provided for adult dental patients (Barasch A., 2013). The purpose of this study was to evaluate the correlation between patients' scores on a written diabetes risk assessment (American Diabetes Association Risk Assessment) and their blood glucose score. Fifteen adult patients from the Weber State University Dental Hygiene Clinic were randomly selected to participate in the study. The results are expected to show a high correlation between the written and clinical risk assessments. This study should improve awareness of risk factors associated with diabetes.

Hepatitis C & Stigma: An Investigation in the Dental Setting

Emily Wiscomb, Danielle Anderson, Ashley Heaton,
& Wendee Christoffersen
Mentor: Frances McConaughy

Poster Display 32
Dental Hygiene

Stigma is a complex phenomenon (Fife & Wright, 2000) and the stigma and discrimination encountered by patients with Hepatitis C has been identified as an epidemic as prevalent as the disease itself (Richmond, Dunning & Desmond, 2004). The purpose of this study was to examine Hepatitis C-related stigma in the dental setting including factors that contribute to stigma, barriers to care and strategies to address these. One participant who self-identified as having Hepatitis C and several practicing Registered Dental Hygienists completed surveys designed to examine the sources of stigma and the effect of this stigma on accessing oral health care. Results will be analyzed to assess these effects and are expected to show that patients might avoid dental care due to stigma related to Hepatitis C. Results are also expected to show that dental professionals may exhibit behaviors that contribute to patients' feelings of stigma. This study will provide insights to improve patient care and reducing patient stigma for individuals with Hepatitis C.

Bat Community Composition in Northern Utah

Kelli Behunin, Cristie Cothran, & Adam Brewerton
Mentor: Sam Zeveloff

Poster Display 11
Zoology

The bats of North America are facing a fatal disease which first started decimating populations in Schoharie County, New York in 2006. This epidemic has since spread south and west at an alarming rate, with the most recent case in Jackson County, Missouri in December 2013. Over 5.5 million bats from 11 different species have now died from *Pseudogymnoascus destructans*, a fungus causing “white nose syndrome.” During the summer of 2013, we conducted field studies with the Utah Division of Wildlife Resources on bat populations in northern Utah. Our primary objective was to characterize the composition of several bat communities, in part to understand the species that could be at risk should white nose syndrome spread to this area. We obtained data which included information about species composition, sex, reproductive status, age, and general health by examining possible wing damage (a symptom of WNS), from ten different species in several locations. Of the observed bats each were apparently in good health (low wing damage). The results of our study provide a better understanding of bat community compositions in northern Utah, and should facilitate awareness about the communities which could be affected by white nose syndrome.

Microbial Screening of Portable Water Sources

Emma Bentley

Mentors: Craig Oberg & Karen Nakaoka

Poster Display 38

Microbiology

Transmission of diseases by fecally contaminated water represents a reoccurring health risk for local populations and travelers from developed nations. The degree of microbial and fecal contamination in potable water was determined by screening 27 samples collected across Guatemala (Guatemala City, Chulac, El Estor, and Flores). Samples of potable water sources were taken from commercial facilities to single dwelling spigots, both urban and rural. Samples were plated on Aerobic Count, Enterobacteriaceae, and E. coli/Coliform Petrifilms™, incubated for 48 h then enumerated. Results showed 92% of the potable water sources contained bacteria, 48% contained coliforms, 15% contained E. coli and 71% were positive for Enterobacteriaceae, indicative of possible Salmonella contamination. Coliform counts ranged from 0 to greater than 1.6×10^2 per ml. Confirmation of E. coli and Enterobacteriaceae required harvesting isolates from individual Petrifilms™. Three methods were used: aseptic scraping, picking colonies and stamping with Rodac plates. The use of Rodac plates resulted in the greatest level of recovery. Thirty isolates, representing the 4 sampling areas, were confirmed on EMB agar and by 16S rRNA sequencing. These results indicate that potable sources, particularly in rural areas of Guatemala, could be a significant source of fecal pathogen transmission to its consumers.

Survey of the Great Salt Lake Virosphere

Kayla Blackford

Mentor: Craig Oberg

Poster Display 39

Microbiology

The microscopic world is one that dominates this planet. They are the bacteria, viruses and parasites that control and shape our ever-evolving environment. It would seem the more the microscopic world is studied, the more questions arise, which opens the doors to more research. My project goal is to observe and survey the virosphere of eleven specific bacteriophages, viruses, within The Great Salt Lake. These eleven bacteriophages (phages) each have specific host bacteria that they naturally target. This process controls the lifecycle of these bacteria and many other organisms within the lakes ecosystem. It is important to complete this survey due to the fact that past Weber State University students discovered these phages but not much other information was gathered about them. Little to no ecology is known about these phages thus little is known about what impacts they have on the lake's ecosystem. Understanding the delicate world of marine viruses can lead to better methods of maintaining a healthy lake, especially if a high human presence is allowed within the lake. My project will include weekly trips down to the lake to observe the water and air temperature, along with the salinity of the lake, and then retrieve a small water sample to be properly assayed back at the lab. One of the methods I will use is the plaque assay, which allows me to count the number of viable live viruses. Other methods will include transmission electron microscopy (TEM) and Epifluorescence microscopy (EfM). Both of these methods will provide a more clear and precise visual of my specimens.

Comparisons of Hands on Learning versus Sharing on Student Performance

Joshua Bradford
Mentor: Brian Chung

Poster Display 10
Zoology

Teaching anatomy in laboratories has recently seen a shift toward new technologies such as computer-based imagery. Although these technologies are widely accessible and relatively cheap, they create a disadvantage in learning compared to methods that utilize hands-on learning methods, such as physical models, which provide students with a unique and intimate understanding of body structures. At Weber State University, Human Anatomy laboratories consist of one instructor to twelve students. We hypothesized that teaching and learning would improve by providing each student with an anatomic model rather than sharing a model among a group, and tested this hypothesis by measuring the learning outcomes of four specific bones over two weeks through randomizing each laboratory section to: 1) providing each student with an individual bone model, or, 2) sharing a bone model between two or more students. Treatment groups were reversed the following week in order to remove influence on overall grade and learning was assessed by lab quiz, lab midterms, and lecture exam questions pertaining to these four specific bone models. While these data are currently being analyzed, we remain confident that the ability to manipulate anatomic models individually rather than sharing will improve learning outcomes.

Antibiotic Resistant Enterococci Isolated from Weber River Locations, Great Salt Lake and Patients

Autumn Brubaker, Madison Landreth,
Jessica Brooke, Cody Zesiger, & Colton Stokes
Mentor: Karen Nakaoka & Mo Sondossi

Oral Presentation (Session 1)
Micrbiology

Enterococcus, a bacterial genus that normally inhabits the gastrointestinal tract of animals, can be pathogenic to humans, causing urinary tract infections, sepsis and other serious diseases. It is a major cause of hospital acquired infections. Complicating infection with Enterococcus is the fact that these bacteria are often highly resistant to antibiotics, making effective treatment more difficult. Even though Enterococcus is a normal inhabitant of the gastrointestinal tract, it can survive outside its host even in adverse environments, such as the Great Salt Lake (GSL). In this experiment, over 400 isolates of Enterococcus were collected from the Great Salt Lake, from various sites along the Weber River and from clinical sources. Isolates were tested for different phenotypic characteristics and for their resistance to several antibiotics. Preliminary results of the disk-diffusion assay demonstrated that 47% of enterococcal isolates from the Great Salt Lake were resistant to one or more of five antibiotics compared to 98% of the clinical isolates. In contrast, as few as 15% of Enterococcus isolated from the fresh water sources were resistant to one or more of five antibiotics. These data may have implications concerning the importance of anthropogenic influences on antibiotic resistance in Enterococcus.

Edge Effect on Mycorrhizal Infection Occurrence in *Gutierrezia Sarothrae* [Asteraceae]

Shannon Call
Mentor: Ron Deckert

Oral Presentation (Session 2)
Botany

Mycorrhizas have a mutualistic relationship between fungi and vascular plants. Mycorrhizal associations are important for plants as they provide minerals, especially phosphorous while the plant provides carbohydrates for the fungi. Edges affect plant community diversity by altering water runoff, soil moisture or encouraging invasive species growth. Because trail edges impact plant communities, I hypothesize mycorrhizal colonization frequency may decrease as distance to a trail edge decreases. To test this hypothesis, *Gutierrezia sarothrae*, a woody shrub native to the western United States, was sampled from two similar sites and at three distances from hiking trails and mycorrhizal colonization frequency was determined. Plant samples were collected one meter, ten meters and twenty meters from the edge of a hiking trail. Statistical difference was determined using chi-square analysis. There was a significant difference in mycorrhizal associations between 1-meter to 10-meters ($p > 0.01$) and 10-meters to 20-meters ($p > 0.005$). Mycorrhizal infection was highest in plants located 10-meters from the trail. After the study was completed, old aerial photographs were discovered showing the existence ten years previously of an old hiking trail which had since been abandoned, thus adding further support to the hypothesis. Results showed differential mycorrhizal colonization frequency, suggesting a negative response near trail edges.

Lack of Song in Females Does Not Drive Sexual Dimorphism in Syringeal Muscles Composition

Linsey Christensen
Mentor: Ron Meyers

Poster Display 14
Zoology

The avian syrinx uses four pairs of intrinsic muscles to control song production. Previous work in our lab using immunohistochemistry revealed two fiber types, fast and superfast. Superfast fibers are rare fibers found in sound-producing animals and contract up to 250 Hz in songbirds. We studied songbird species from different families to understand the role of superfast fibers in singing. Male songbirds typically sing more complex songs than females, who may sing occasionally or not at all. In species where males sing and females sing at least occasionally (European Starlings, *Sturnus vulgaris*; White-crowned Sparrows, *Zonotrichia leucophrys*; House Sparrows, *Passer domesticus*; Red-winged Blackbirds, *Agelaius phoeniceus*; Yellow-headed Blackbirds, *X. xanthocephalus*), both sexes had similar composition with superfast fibers outnumbering fast. In two Estrildids where males sing and females do not (Zebra Finches, *Taeniopygia guttata*; Bengalese Finches, *Lonchura domestica*), males possess a greater percentage of superfast fibers than females (80% in males, 25% in females). This difference in fiber percentage supports the hypothesis that superfast fibers are important in singing. However, two other species with sexually dimorphic singing behavior (Brewer's Sparrows, *Spizella breweri*; Brown-headed Cowbirds, *Molothrus ater*), had superfast fibers outnumbering fast in both males and females. These findings suggest that singing does not account for the occurrence of superfast fibers in the syrinx and the presence of these fibers is likely a taxonomic factor. Our lab is currently investigating other Estrildids to test that hypothesis. Further investigation is needed to determine if superfast fibers are necessary for other non-singing functions.

Investigating Supernova Structure

Kendell Coburn

Mentor: Tabettha Hole

Poster Display 12

Zoology

Supernovae are cataclysmic explosions at the ends of the lives of certain stars. They have a major impact on our understanding of the evolution of the interstellar medium, star formation and stellar evolution. They are also necessary to our understanding of cosmology, including our recent discovery of the accelerating universe and dark energy. But there are still significant questions as to the precise mechanism by which these stars blow themselves apart, and which impact their final structure and composition. Our work seeks to answer these questions by modeling the structure of supernovae, particularly the idea that the material they eject is “clumpy.” We will present the results of our simulations of various clump sizes and configurations, and discuss their implications for our understanding of supernova structure.

The Bee Fauna of Snow Canyon State Park, UT

Andrew Corbin

Mentor: John Mull

Oral Presentation (Session 2)

Zoology

Bees provide important pollination services to all ecosystems containing flowering plants. Declines in many native bee species have been documented in North America, revealing the need for close monitoring of bee populations. Our goal was to document the bee diversity of Snow Canyon State Park, providing a baseline for future research. While bee surveys have been conducted across much of southern Utah, there has never been a comprehensive bee survey within Washington County, which contains Snow Canyon State Park. The survey was conducted over the course of seven months, from March to September of 2013. We employed pan traps (colored plastic bowls) and net collecting. Bowls were deployed eight times during the collecting period at four pre-selected locations within the park, and six bowls were placed at each location to yield a total of 192 trap days. A total of 1452 bees were collected, representing 65 species. Based on preliminary analyses of capture rates, there is no significant overall difference in trap color preference. A collector’s curve will be derived to estimate the need for additional sampling.

Native Plant Extracts as Inhibitors of Common Bacterial STD Pathogens

Sarah Eccles
Mentor: Jason Fritzler

Poster Display 6
Microbiology

Sexually transmitted diseases are a growing epidemic around the world which burden society with substantial health and economic consequences. Pathogens such as *Neisseria gonorrhoeae*, *Gardnerella vaginalis*, and *Haemophilus ducreyi* are known STD causing bacteria that can cause infertility and increased susceptibility to Human Immunodeficiency Virus (HIV) and other bacterial, viral, and parasitic infections. With antibiotic resistant strains becoming more prevalent, the need for new antimicrobial agents is extremely high. Although still in its youth, research on the natural antimicrobial properties of native plants has been of growing interest in the medicinal world. By isolating these three pathogens, we were able to perform in vitro testing using a standard micro-well assay to research the antimicrobial activity of 50 native plant extracts on each bacterium. Extracts that showed inhibitory effects were further tested using a range of concentrations to determine the minimal inhibitory concentration using the same micro-well assay. A total of fourteen different extracts were observed to have antimicrobial properties with two of the extracts inhibiting growth of all three pathogens.

Impact of Fluoxetine on Levels of IL-10 and Interferon Gamma in C57BL6 Mice

Matthew Fullmer & Sterling Haws
Mentor: Lauren Fowler & Karen Nakaoka

Oral Presentation (Session 1)
Microbiology

Objectives: To explore the effect of administration of the antidepressant fluoxetine on levels of IL-6, IL-10, and interferon gamma in vivo using C57BL6 mice. **Methods:** After IACUC approval, female C57BL-6 mice were separated into groups of twelve mice each, forming a control and experimental group. Before dosing the mice, blood samples were collected from both groups to determine baseline cytokine levels. For four weeks the experimental group was given daily dose of peanut butter with fluoxetine while the control group was given peanut butter alone to account for any placebo effect. After four weeks, blood samples were obtained. Cytokine assays of the sera were performed by the University of Maryland Cytokine Core Laboratory. **Results:** Other researchers have shown that cytokines play a role in the pathogenesis of depression and antidepressants affect the immune system through interaction of the CNS with immune cells primarily through modulation of cytokine release. Pro-inflammatory cytokines, such as IL-6, are implicated in the onset of depression and antidepressants have been shown to decrease these cytokines. Our study will also provide evidence concerning whether levels of IL 10, an anti-inflammatory cytokine, and interferon gamma, a cytokine of the innate immune response, are impacted by fluoxetine.

Timing and Source Relationships of Campanian Strata, Southern Utah Basins

Kari Godfrey
Mentor: Jeff Eaton

Poster Display 41
Geoscience

This study focuses on the relationship between the Tarantula Mesa Sandstone and the overlying “beds on Tarantula Mesa” in the Henry Mountains basin (~65m thick) and the capping sandstone member of the Wahweap Formation and the overlying Kaiparowits Formation in the Kaiparowits basin (~105m thick) with the goal of determining if the previously proposed correlation is correct. Distinctive, well-rounded, recycled eolian quartz grains in the capping sandstone member of the Wahweap Formation are absent in the overlying Kaiparowits Formation suggesting a change in source. The Tarantula Mesa Sandstone lacks eolian quartz grains yet they are present in the overlying “beds on Tarantula Mesa.” The arkose to lithic arkose sandstones of the Wahweap Formation and “beds on Tarantula Mesa” also are compositionally similar as compared to the litharenite sandstones of the lower part of the Kaiparowits Formation. The lithologic similarity of the capping sandstone member of the Wahweap Formation and the “beds on Tarantula Mesa” are further supported by shared east-southeast trending paleocurrents. This study suggests that the original correlation was incorrect and that the capping sandstone member of the Wahweap Formation and the “beds on Tarantula Mesa” were sourced by the same river system at the same time.

Incubation Constancy of American Avocets (*Recurvirostra Americana*) Nesting in an Extreme Environment

Josh Hall
Mentor: John Cavitt

Oral Presentation (Session 2)
Zoology

Reproduction in birds is extremely conservative with the vast majority of the species adopting bird-egg contact incubation to maintain an appropriate microclimate for embryonic development (Deeming, 2004). The Great Salt Lake is an important nesting site for thousands of American Avocets (*Recurvirostra americana*) each year. However, the local climatic conditions can be extreme during the breeding season with very low humidity and daytime temperatures often reaching above 38°C. In addition, nesting success at Great Salt Lake can be very low for this species (14% of nests producing young, Cavitt 2008). These extreme conditions may negatively affect the fitness of American Avocets by interfering with the development of embryos, or resulting in increased energy expenditures of incubating adults. Constancy of incubation, the time that the eggs are in contact with an adult, has been shown in other species to be a major indicator of nesting success. Our goals were to examine some of the costs associated with nesting in such a hostile environment and determine if behavioral modifications can ameliorate these effects. We examined incubation constancy and the thermal environment of eggs by placing temperature probes in active American Avocet nests. Artificial nests with painted chicken eggs were also monitored to measure the thermal environment in the absence of adult incubation. A motion sensitive camera was also placed at nests to examine variation in parental care during incubation. Temperature and video data demonstrated incubation constancy varied throughout the nesting cycle and across nests. In addition, ambient conditions had a significant effect on parental behavior. These data provide important information on the behavior and adaptation of this species to an extreme environment.

Metagenomics of Great Salt Lake Microbes

Christopher Hill

Mentors: Jonathan Clark & Mo Sondossi

Poster Display 9

Zoology

Metagenomics is a relatively new field of study that attempts to examine the microbial world by characterizing organisms genetically, eliminating the need for culturing. This technique is extremely useful since the diversity of microbial life far exceeds the ability to culture microbes in the laboratory. This study uses metagenomics to characterize bacteria from Great Salt Lake (GSL). As in many environments, bacteria are the foundation for the GSL ecosystem. DNA was isolated from several environmental samples and microbial diversity was examined by DNA sequence analysis of the 16S rRNA gene. These sequences were compared to those from the genetic database to identify GSL microbes. Such comparisons not only allow identification of bacteria, but also reveal the relationships of these bacteria to one another. This study provides information about the diversity of bacteria in GSL and may shed light on the ability of microbes to thrive in extreme environments.

Interaction of Fungal Endophytes and Gall-Forming Aphids on Hybrid Cottonwood Trees

Julia Hull

Mentor: Ron Deckert

Oral Presentation (Session 2)

Botany

Endophytes are fungi that live within aerial portions of plants for most or all of their life cycle without causing visible signs of disease. Gall forming aphids, *Pemphigus betae*, are highly competitive over gall site selection, forming galls on the leaves of narrowleaf cottonwoods and their hybrids. The favored gall location overlaps with areas of highest endophyte probability. I hypothesized that a negative correlation would exist between endophyte infection and aphid galling on leaves of backcross hybrid cottonwood trees. I tested my hypothesis by obtaining samples of six backcross hybrid cottonwood trees along the Weber River in Weber County, Utah from 10 July to 17 July 2013. I took leaf samples of galled and ungalled leaves and the corresponding twigs from the current year and the previous year. Samples were surface sterilized using ethanol and bleach, aseptically plated onto potato dextrose agar, and were allowed four weeks to incubate at room temperature. Samples were scored every other day for endophytes. At the end of four weeks, data were collected and statistical analysis was performed via t-test (Microsoft Excel) and a Chi-squared test. My hypothesis was rejected. I found significantly more endophytes associated with galled leaves than in leaves without galls. Possibly, either the aphids are attracted to the areas with high endophyte infections or the aphids themselves are introducing endophytes into the leaves.

Synthesis of Metal Organic Frameworks

Sarah Kortkamp, Chandler Greenwell, & Eric Young
Mentor: Timothy Herzog

Poster Display 27
Chemistry

Synthesis of novel metal organic frameworks were studied using zinc clusters and ferrocene dicarboxylate ligands. A crystalline material was isolated and characterized by powder X-ray diffraction and single crystal X-ray diffraction. The compound was found to have a discrete structure with six ferrocene units and a large zinc cluster at the core. Synthetic methods and structural details will be discussed.

Antimicrobial Properties of Penstemon Cyananthus

Vanesa Martinez
Mentor: Sue Harley

Poster Display 5
Botany

Native Americans used various *Penstemon* species in a number of medicinal applications, including pain relief, as a laxative, and topical treatment of wounds. Research on *Penstemon campanulatus* has identified several phenolic compounds that have antimicrobial activity when tested in liquid cultures of bacteria and fungi. *Penstemon cyananthus* grows all along the Wasatch range and has not been investigated for its chemical composition or antimicrobial activity. The purpose of my research is to isolate phenolic compounds from *Penstemon cyananthus* and determine if they have antimicrobial properties. Compounds extracted from leaves will be separated by low pressure liquid chromatography. Following chromatography, the compounds will be tested for activity against gram-positive and gram-negative bacteria. I am still in the beginning stages of this project and plans are going according to schedule. I expect to have results by early April 2014.

Fabrication of Graphene Supercapacitors

Ronald Marx
Mentor: Colin Inglefield

Oral Presentation (Session 2)
Physics

With the rise of demand in on chip energy storage in electronics, interest in graphene and other solid state devices has risen considerably. As devices become smaller, demand for easy to access power dominates most needs of a small electronic device. Graphene supercapacitor's large reported energy density and flexibility will hopefully fill this need. Graphene's many unique properties make it ideal to work with when creating supercapacitors. While common graphite is mainly amorphous, graphene's extremely uniform structure lies in a two-dimensional plane, allowing for low resistivity along the plane, yet high resistivity through the sheet of graphene. Graphene's flexible, conductive, and single plane properties make it an excellent choice for research in supercapacitors. Over the course of the past summer, I was able to conduct research with Dr. Inglefield regarding one process of fabrication for graphene supercapacitors.

Review of Wheat Cultivation and Celiac Disease

Taylor Nelson
Mentor: Don Davies

Oral Presentation (Session 2)
Chemistry

Diagnoses of Celiac Disease (CD) have increased in prevalence over the past half-century. There are several possible reasons for this within the context of modern diets and population genetics. Recently, however, more hypotheses have surfaced which suggest that various practices surrounding modern agriculture may have something to do with the prevalence of CD. A comprehensive review of the literature containing the varying hypotheses has been performed and the data have been analyzed. Four main causes of the increase in CD have been suggested in the literature. These four suggested causes are: 1- Overuse of nitrogen fertilizers, 2- Plant breeding techniques which have increased "toxic" epitopes, 3- Increase in usage of vital gluten in food products, and 4- Increase in recognition of CD. According to the literature, of these four, the overuse of nitrogen fertilizers is the most plausible.

Genetic Classification of Arnica Species

Taylor Nelson
Mentor: Sue Harley

Oral Presentation (Session 1)
Botany

Previous studies on species of Arnica have emphasized the utility of specific compounds within these plants as medicines. However, due to the difficulty in classifying certain specimens, genetic analyses have been utilized in recent studies to clarify systematic boundaries within this genus. These studies have included specimens within the genus from around the world, but none of the studies has included specimens from the intermountain west. In my work on the Arnicas of northern Utah, I found that the morphology of at least two species (*Arnica longifolia* and *A. diversifolia*) left ambiguity concerning the correct species identification. In addition, the chemical profiles of at least two species did not align with the correct species identification. Therefore, using DNA isolation, PCR, and DNA sequencing methods, I will compare four species of Arnica (proposed to be: *A. longifolia*, *A. parryi*, *A. latifolia*, and *A. diversifolia*) and one negative control species, *Helianthus annuus*, to see if the DNA profiles align with the chemical profiles. This comparison can then be used to confirm or reject species identifications.

DNA Barcoding of Great Salt Lake Invertebrates

Son Nguyen
Mentor: Jonathan Clark

Poster Display 15
Zoology

Brine flies and brine shrimp are the most conspicuous invertebrates inhabiting the waters of Great Salt Lake. However, there are likely many more invertebrates associated with the Great Salt Lake ecosystem. For example, the corixid *Trichocorixa verticalis* (found in bays and along island margins) is an important predator of brine shrimp larvae. The dynamic of interactions among these invertebrates is poorly studied and yet is an important influence in the community structure of this saline lake. The purpose of this study was to use DNA barcoding to confirm the identity of these invertebrates and determine if additional, undescribed species exist. DNA barcoding is the recognized international standard for species identification. The technique examines the nucleotide sequences of a portion of the mitochondrial gene, cytochrome oxidase I (COI). Our results have been added to the international database of DNA barcodes (<http://www.boldsystems.org/>), providing important data about the diversity of organisms associated with extreme environments.

Automated Tracking Antenna for High-Altitude Atmospheric and Climate Research

Michael Shaw, Drew Adams, Ben Jones,
& Spencer Ito
Mentor: John Sohl

Poster Display 43
Physics

Weber State University is home to the High-Altitude Reconnaissance Balloon for Outreach and Research (HARBOR) team, which studies atmospheric and climate behavior. Data is collected through balloon flights into near-space atmosphere with on-board electronics. Some HARBOR electronics require a line-of-sight signal link, which is/was currently maintained via manually aiming a YAGI antenna in the approximate direction of the balloon. This method causes significant data loss whenever sight is lost, the users need to hand off the antenna to another, or there is improper positioning. We have designed an automated tracking-antenna (ATA) which will maintain line-of-sight tracking for the entire duration of the balloon flight (anywhere from 30 minutes to a few hours) using GPS data received from the balloon over HAM radio. We have not yet used the ATA for a HARBOR flight, which is when we will make the comparison of data integrity and loss for each system. We have designed the ATA to be expandable on features for future modifications and implementations. The final design and full documentation is open and available for research teams to integrate into their own systems. Total raw cost for the complete system is approximately \$1500; not including construction materials and miscellaneous components.

Species Differences in the Restructuring of Syringeal Muscles after Denervation

Kyle Spainhower, Carly Milligan,
& Linsey Christensen
Mentors: Ron Meyers & Franz Goller

Poster Display 13
Zoology

The muscles of the avian vocal organ, the syrinx, are composed of fast and superfast muscle fibers, which enables them to rapidly control song features. Unilateral denervation of the syrinx results in the reduction of cross-sectional area and a shift to slower fiber types. Our previous denervation experiments on male Zebra Finches (*Taeniopygia guttata*) showed a 10% reduction of total muscle cross-sectional area and a 30% reduction of superfast fibers seven days after unilateral denervation of the syrinx. Decrease in cross-sectional area and superfast fiber percentage reached a maximum at eleven days at 72% and 70% of their original values. By 40 days, the cross-sectional area and fiber percentage of the denervated side had almost returned to their original values. Because this post-denervation recovery is unusually rapid in Zebra Finches, we repeated the experiment on male Yellow-headed Blackbirds (*X. xanthocephalus*) for comparison. Four birds were unilaterally denervated between three and 35 days. We quantified the cross-sectional area and the average fiber diameter for each bird, and the results differed greatly from those of the Zebra Finch experiments. By day seven, cross-sectional area was reduced to 85% of its original value, average diameter of both fiber types decreased, and each continued to decrease post-denervation. In contrast to the finches, cross-sectional area of the blackbird denervated syrinx was reduced to 40% of control by day 17. Results from the Yellow-headed Blackbirds are consistent with the results from work done on mammals and suggest that innervation of the syrinx in Zebra Finches may be unusual. Further studies will repeat the experiment at additional time intervals and increased sample size.

Caching Behavior of The Specialist Woodrat “Neotoma Stephensi”

Ashley Van Leuven
Mentor: Michele Skopec

Poster Display 8
Zoology

Woodrats (genus “Neotoma”) are known for their prolific caching behaviors. “Neotoma stephensi”, a juniper specialist, frequently builds its middens in juniper trees and consumes up to 90% of its diet as juniper. Field evidence suggests that “N. stephensi” caches predominantly juniper in its middens. By contrast, the sympatric generalist “N. albigula” appears to cache a larger variety of both plants and non-plants in its middens. In order to determine if the two species have differences in their caching behavior, we compared them in a laboratory setting. Woodrats of both species were placed in cages that had two external compartments where different food and or non-food items were placed for caching. When offered rabbit chow (food) in one compartment and jingle bells (non-food) in the second compartment, the generalists cached more food and non-food than the specialists; who solely cached food. When offered the choice between juniper in one compartment and rabbit chow in the second compartment, the specialists cached more juniper than rabbit chow and consumed more juniper than the generalists. However, the generalists still cached more juniper and rabbit chow than the specialists. Given that juniper was the specialists’ preferred item to cache, we next offered the specialists jingle bells that covered juniper in one compartment; while the other compartment contained only jingle bells. The specialists showed a preference for the jingle bells that impeded their access to juniper. We conclude that the specialist, “N. stephensi”, displays a decreased caching behavior in terms of both quantity and variety of items cached compared to the sympatric generalist, “N. albigula”.

Range Expansion and Exponential Growth in Eurasian Collared-Dove

Adam Winegar
Mentor: John Cavitt

Poster Display 7
Zoology

The Eurasian Collared-Dove (*Streptopelia decaocto*) was introduced from the Netherlands into Nassau, New Providence, Bahamas by a pet breeder (Hengeveld 1993). These doves have migrated to North America, initially establishing in southern Florida, USA, in the early 1980s (Smith 1987). The Eurasian Collared-Dove is one of the most successful terrestrial invaders in its spread and colonization (Fujisaki 2010). At the present time, there appears to be minimal control on population numbers and expansion of the Eurasian Collared-Dove. Flexibility in use of food sources, nesting sites, and continued conversion of natural habitats into suburban, urban, and agricultural areas, have promoted continued range expansion and population increase (Romagosa 2012). We examined the expansion of this species in Utah and tested to see if population growth is exponential. Data were obtained from two large databases, the Christmas Bird Count and the Breeding Bird Survey. These datasets indicated that the Eurasian Collared-Dove was first recorded in Utah in 2002 and spread quickly throughout the state. Count data also confirm exponential growth for this species. References Hengeveld, R. (1993) “What to Do about the North American Invasion by the Collared Dove? (¿ Qué hacer sobre la invasión de *Streptopelia decaocto* en Norte América?)” *Journal of Field Ornithology*: 477-489. Romagosa, Christina Margarita. 2012. Eurasian Collared-Dove (*Streptopelia decaocto*), *The Birds of North America Online* (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the *Birds of North America Online*: <http://bna.birds.cornell.edu/hal.weber.edu:2200/bna/species/630doi:10.2173/bna.630> Smith, P. W. 1987. The Eurasian collared-dove arrives in the Americas. *American Birds* 41:1370–1379.

Captivating the Curious: Implementing Technological Strategies as an Interactive Method on Science-b

Sara Yearsley & Amanda Gentry
Mentor: David Matty

Poster Display 42
Geoscience

The efficacy of using science-based trail signage as a method of interpretive communication, balancing both cognitive and affective learning experiences, is dependent on a number of factors including the use of interactive methods. With the rapid growth of technology, traditional hands-on approaches can be expanded to incorporate technological strategies that act as a reciprocal method to engage viewers. The most practical adaptation of interactivity employs the Quick Response (QR) system. This study was designed to ascertain if QR codes are an effective way to increase the viewer's connection with the sign's message. A survey was presented to randomly selected individuals who were asked to view two identical signs, one with and one without a QR code. Data collected included sign preference, hiking frequency, as well as QR capability, use and interest. The majority said they sometimes or frequently hike Ogden Trails, and more than half preferred the sign with the QR code. Most do not currently use QR codes, but over half said they would use QR codes to enhance their hiking experience. Ultimately, it was concluded that QR codes could be used on interpretive signage as an engaging technique to help the viewer forge personal connections with the environment.



College of Social & Behavioral Science

Justified Suspicion of Ontology-Speak

Dwight Adams
Mentor: Robert Fudge

*Oral Presentation (Session 1)
Political Science & Philosophy*

This paper attempts to dissolve Rudolf Carnap's argument for the meaninglessness of ontology found in "Empiricism, Semantics, and Ontology" while showing that Carnap's argument nevertheless contributed to ontological discourse. After posing Carnap's argument as itself a linguistic framework of the same type his theory describes, two questions are asked about it: Is it true, and is it useful? The former question yields unsatisfactory results due to contradiction and implausibility. Answering the latter question in the affirmative seems arbitrary. Answering it in the negative destroys Carnap's system because he rests the sole value of linguistic frameworks on their usefulness. Furthermore, if Carnap's framework is true, it would constantly be subjected to utility comparisons, allowing it to cease to have ontological significance from one moment to the next depending on whether it or an ontological claim were more useful to hold. Nevertheless, Carnap's argument contributes to our overall understanding of ontological discourse and serves as a warning to those who uncautiously ascribe ontological significance to strictly linguistic artifacts.

The Effects of Perspective Taking and Religious Orientation on Attitudes toward Homosexuality

Logan Allen & Aaron Ashley
Mentor: Todd Baird

Poster Display 3
Psychology

Using a mixed model design, participants were randomly assigned to complete the Multidimensional Measure of Sexual Prejudice. Two groups completed the measure from either a self or unbiased person perspective while the other two groups completed the measure from both perspectives with counterbalancing. Preliminary data indicates that treatment order created polarization in attitudes towards homosexuality.

Lavender Oil and State Anxiety: Priming and Personality

Eric Bitton & Jordan Bybee
Mentor: Todd Baird

Oral Presentation (Session 1)
Psychology

The effects of lavender essential oil on state anxiety were assessed. Expectancy priming and personality traits were evaluated as contributors to its effect. Participants completed inventories and rated images for valence and arousal while experiencing diffused lavender or water. Two of the treatment groups experienced suggested lavender facilitation or inhibition primes. The lavender inhibition group displayed a statistically significant difference between pre ($M = 1.75, SD = .40$) and post treatment anxiety scores ($M = 2.11, SD = .63$) $t(35) = -3.36, p = .002$. Anxiety & big-five personality trait correlates were exhibited. A significant correlation was found between state anxiety scores and neuroticism at $r = .261$. A negative correlation was found between state anxiety and extraversion at $r = -.168$. Agreeableness and state anxiety were negatively correlated at $r = -.180$. An ANOVA was used to assess if there was a difference between groups' arousal ratings for the images. No statistically significant differences were found $F(3,138) = .786, p = .503, \eta^2 = .017$. Results did not provide support for the use of lavender oil in the treatment of anxiety.

Behaviors, Motivations, Beliefs, and Attitudes Related to Bottled Water Usage at Weber State University

Zack Bjerregaard, Matt Booth, Anthony King, Shannon Clugston, Miles Dittmore, Stephen Fossett, Dusty Pilkington, & Pieter Sawatzki
Mentor: Carla Trentelman

Oral Presentation (Session 2)
Sociology

This exploratory study aims to better understand the prevalence of bottled water consumption by students, faculty, and staff at Weber State University in Ogden, Utah, and positive and negative consequences of that consumption. In this multi-method study, we conducted a survey, receiving completed questionnaires from 711 students, faculty, and staff. Additionally, we gathered campus bottled water sales data, participated in a trash audit, researched the disposal of the plastic bottles, and investigated the demographics of brands consumed on campus to determine their environmental footprint. Twice as many of our survey respondents preferred tap water over bottled water; both groups reporting convenience and cost among their top reasons. While there is evidence of some economic benefit to the university from bottled water sales, this study was unable to discover the exact amount. Our findings indicate there are more negative consequences from bottled water consumption (particularly the environmental footprint) than positive ones.

The Uyghur Diaspora in Kyrgyzstan: Perspectives on the Sino-Soviet Presence in Central Asia

Ian Crookston
Mentor: Kathryn MacKay

Oral Presentation (Session 1)
History

The Uyghurs have been migrating to the area now known as Kyrgyzstan for the past two centuries, though what it means to be a Uyghur only emerged in the last century. Seeing the benefits of such an influx of potential collectivized laborers coming from across the Chinese border, the leadership of the Soviet Union capitalized off of the Uyghurs desire to escape Communist Chinese oppression by orchestrating and facilitating the largest migration of tens of thousands of Uyghurs, as well as other ethnic Turks during the late 1950s and early 1960s. Since the collapse of the Soviet Union, the exiled Uyghurs of Kyrgyzstan find themselves living under the growing influence of the Chinese. This paper gives a brief overview of the Uyghur community that today is within Kyrgyzstan, it discusses their history from the period in which they began their migrations in the 1800s to the formation of the independent Kyrgyz Republic in 1991. Although oral histories tend to be laced with inaccuracies, biases, and other difficulties, they also provide deep insight into the lives, emotions, and feelings of participants; all of which Uyghurs fleeing China felt at the time and still feel today. The oral histories also provide insight into the life of an average Soviet citizen in the Central Asian Republics of the Soviet empire, giving evidence that most Soviet Uyghurs were treated well, although many were also subject to Chinese and Stalinist oppression and racism, as well as a legacy of government censorship in a struggle for their own national self-determination.

Coordination of Guilt and Regret: A developmental Study

Patricia Dirks
Mentor: Eric Amsel

Poster Display 4
Psychology

The present research examines how children develop an understanding of complex social situations in which actions of a perpetrator may inadvertently cause harm to a victim. It was hypothesized that only older children or young adolescents would coordinate guilt and regret by judging a perpetrator as feeling worse in situations where regretted actions produce guilt-inducing harm, than situations which have one, the other, or neither of these characteristics. One hundred students aged 6-30 were asked to distinguish between slightly different scenarios involving harm caused by a perpetrator. Only older students recognized perpetrators would feel worse about harm caused if it could have been avoided.

Bilinguals and Religiosity

Benjamin Eschler
Mentor: Aaron Ashley

Oral Presentation (Session 1)
Psychology

The effects of language on religiosity were examined in Spanish-English bilinguals. Students were given the Big 5 Personality Inventory, the Religious Life Inventory, and the Language Experience and Proficiency Questionnaire in English and Spanish. It is anticipated that bilinguals will exhibit differences in these measures depending on the language used.

The Serotonin Transporter Gene Polymorphism as a Predictor of Novelty Seeking, Smoking Behavior, and Cognitive Assessment of Risk

Houda Nizam & Desirae Wood

Mentor: Matthew Schmolesky & Barb Trask

Poster Display 2

Psychology

In previous research, a polymorphism in the promoter region of the serotonin transporter gene (5-HTTLPR) has been associated with anxiety (Ebstein, 2006) and smoking behavior (Kremer et al., 2005). Other studies suggest that high novelty seeking (NS) personality trait scores predict marijuana use (Hale et al., 2003). In this current study, we test whether the 5-HTTLPR serotonin transporter gene polymorphism can be a predictor of NS, marijuana use, cigarette smoking, and cognitive risk assessment. Undergraduate students ($n = 284$), aged 18 and above ($M = 21.5 \pm 6.0$), provided cheek cells for genotyping. Students completed three questionnaires in random order: the Cloninger Temperament and Character Inventory, a Physical Risk Frequency Inventory, and a Physical Risk Assessment Inventory to determine how often students engage in risky behavior and how dangerous they rate different behaviors (e.g. marijuana smoking, cigarette smoking). Genotyping was conducted using polymerase chain reaction to determine whether subjects were homozygous for the short version of the gene (S/S), homozygous for the long version (L/L) or heterozygous (S/L). Among the 77 genotyped participants, 21 were S/S, 35 were S/L and 21 were L/L. As predicted, we found a positive correlation between marijuana and cigarette smoking behavior ($r = .39$; $p < .05$) and negative correlations between smoking risk assessment and smoking behavior for both marijuana ($r = -.37$, $p < .05$) and cigarettes ($r = -.13$, $p < .05$). Interestingly, high novelty seekers rated marijuana smoking as less dangerous than low novelty seekers. Moreover, religious activity was negatively correlated to smoking behavior and positively correlated to risk assessment. Supporting previous research, NS was positively correlated to cigarette smoking ($r = .22$, $p < .05$) and we found a similar relationship for NS and marijuana use ($r = .19$, $p < .01$).

However, one way ANOVAs revealed no significant differences between the S/S, S/L, and L/L groups for NS ($S/S = 20.7 \pm 6.5$; $S/L = 21.0 \pm 7.3$; $L/L = 20.0 \pm 7.4$) or risky behavior (SSCigarette = 1.90 ± 1.84 ; SLCigarette = 2.0 ± 2.0 ; LLCigarette = 1.9 ± 2.2 ; SSMarijuana = 1.9 ; SLMarijuana = 1.8 ± 1.5 ; LLMarijuana = 1.6 ± 1.6). Further analysis and research remains necessary to understand more fully the role of the 5-HTTLPR polymorphism in modulating risky behavior, cognitive assessment, and personality traits.

Technology in Families

Preslee Patton, Lola Moli, Natalie Barcelo,
& Courtney Woodfield
Mentor: Colleen Packer

Oral Presentation (Session 2)
Communication

Every day we are bombarded with technology in virtually all facets of our lives, especially in our families. This study explores the influences of technology on family relationships. Using the Uses and Gratifications theory, this study analyzes 50 surveys using thematic content analysis and descriptive stats as a methodological framework. Findings suggest that contextual factors, reason for technology use and proximity influences whether technology enhances or inhibits family relations. These results may be helpful to families who struggle with technology use in the home.

Determining Late Holocene Environmental Conditions for the Bobcat Rockshelter, Snake River Plain, ID

Dusty Pilkington
Mentor: Julie Rich

Oral Presentation (Session 2)
Geography

Determining Late Holocene environmental conditions for the Bobcat Rockshelter, Snake River Plain, Idaho USA. Dusty Pilkington Department of Geography, Weber State University, 1210 University Circle Ogden, UT, 84403-1210. Bobcat Rockshelter is a Northern Shoshone camp in Skull Canyon, Idaho, first excavated in 1960 by Idaho State University's Earl Swanson. The site was a hunting base, with butchered remains of large/small game animals. The site was further excavated summer 2012, uncovering eight distinct strata. Historical remnants constrain the depositional timing for strata 1 through 3 to >1850. Strata 4, 6 and 8 are fluvial sediments, while 5 and 7 are colluvium from a limestone overhang. Optically Stimulated Luminescence (OSL) provided age control on strata 4 through 8. Depositional timing for these strata was compared to regional proxy data provided by others to determine climatic conditions for the Bobcat Rock shelter. Stratum 4 age estimates indicate deposition between 952-1312 AD. Dendrochronology data from Yellowstone National Park (YNP) and aeolian activity at nearby St. Anthony Dunes indicate drought conditions while stratum 4 was being emplaced. Stratum 5 was stratigraphically incoherent, due to impartial sediment bleaching. Stratum 6 was emplaced between 532-1372 AD, a period correlating with a drought episode detected in YNP archeological records, enhanced accretion at St. Anthony Dunes, and tree-ring data indicating Four Corners drought ~700-900 AD. Stratum 7 age-estimates ranged from 422-842 AD, which generally correlate with drought activity ~699-823 AD, determined from California sequoia dendrochronology. OSL dates for stratum 8 ranged from 658 BC-58 AD, a period when Wyoming Basin cave middens indicate a mesic climatic. Varying climatic conditions likely influenced Shoshone lifestyles at the Bobcat Rockshelter during the time when strata 4 through 8 were emplaced.

Food, Comfort and a Bit of Home: Maude Porter and the Ogden Canteen 1942–1946

Lorrie Rands
Mentor: Kathryn MacKay

Oral Presentation (Session 1)
History

On March 25, 1942, the Weber County Red Cross opened a canteen to provide food and friendship to the soldiers passing through the Union Station in Ogden, Utah. The purpose of this paper is to provide the background as to how canteens were organized by the American Red Cross across the nation during World War II and to tell the history of the local Ogden canteen. Using canteen log books obtained from the Weber County Red Cross, scrapbooks related to Red Cross activities obtained from the Union Station Library in Ogden, other materials found at the National Archives in College Park, Maryland, and recently obtained oral histories, it is possible to piece together how the canteen was organized, to describe its day to day operations, and to come to know some of the women who volunteered at the canteen on a regular bases. The log books show how the Ogden canteen even became a model for volunteers throughout the country who wanted to open their own Red Cross canteen. The diary of the canteen committee chair, Mrs. Maude Porter, reveals how dedicated she and other volunteers were to this effort. The canteen was open seven days a week from 7:00 in the morning to whenever the last man was served. In its four years of operation, the canteen had 200 volunteers who served approximately 1.6 million service members. Ultimately this paper is about the women who organized and ran the canteen and about the impact they had on the soldiers they served.

Social Connectivity and the Youth Vote: Comparing Youth Voter Turnout in 1992 and 2008

Daniel Simmons
Mentor: Leah Murray

Poster Display 52
Political Science & Philosophy

I looked at ANES data archives from presidential elections in 1992 and 2008 to determine if social connectivity proved to correlate with youth voter turnout. I compared similar elections in order to determine if social connectivity declined along with the voter turnout from Generation X to Millennials. I considered employment status, marital status, and religious service attendance to form an index for social connectivity. Employment status is the best indicator as it has a strong correlation to youth voter turnout. If youth are working, they are more likely to vote. Marital status is a troublesome indicator, as the difference in marriage rates did not correspond with the difference in youth voter turnout between the two elections. Finally, religious service attendance had a negative correlation to youth voter turnout. Taken together, I cannot say with confidence that social connectivity explains youth voter turnout. However, I cannot state the negative finding either. Perhaps the most troubling discovery I made was the lack of data and information about youth voter behavior. If we are going to learn about the causes of youth voter turnout, and youth political behavior generally, a more concerted effort to include youth citizens in the data pool must be made.

