



*Weber State University  
Sixth Annual Undergraduate Research  
Symposium & Celebration*

*Thanks to Dr. Shelley Thomas and her students Ginger Gunnell, Catherine Harris, Elizabeth Clark, Andrew Blodgett, Heather Sheffield, Ben Sperry, Daniel Hart, Ryan Harris, and Sarah Clayton for their editing assistance with this program, and to Ximen McMillan for her design and editing assistance. Symposium events arranged by Amy Douangdara. Symposium program and promotional materials designed by Elizabeth Dohrer.*

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*Weber State University*  
*Sixth Annual Undergraduate Research*  


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*Symposium & Celebration*

<b>Registration:</b>	Welcome Message.....2
<b>9:00-11:00 am</b>	F. Ann Millner, Ed.D., President
Check-in and registration for Symposium participants, March 23, 2009, Shepherd Union Ballroom	Michael Vaughan, Ph.D., Provost
<b>11:00 am</b>	John F. Cavitt, Ph.D., Director Office of Undergraduate Research
Posters Available to View	Undergraduate Research Task Force
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Morning Oral Sessions Begin	Oral Presentation Schedule.....6
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Afternoon Oral Sessions	John B. Goddard School of Business & Economics.....19
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Poster Session	Jerry and Vicki Moyes College of Education.....25
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*Weber State University*  
*Sixth Annual Undergraduate Research*

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*Welcome Message*

Welcome to the Sixth Annual Undergraduate Research Symposium and Celebration! I am pleased that you have joined us for this year's celebration of student innovation, creativity, and scholarship. Today, students from a variety of academic disciplines have come together to showcase their work through oral and poster presentations and we applaud their efforts.

These students have had the opportunity to experience the dynamic combination of scholarship, teaching and research; their mentors have had the opportunity to extend their knowledge and to enjoy the rewards of collaboration. In the spirit of exploration, many have also reached out to our community to learn.

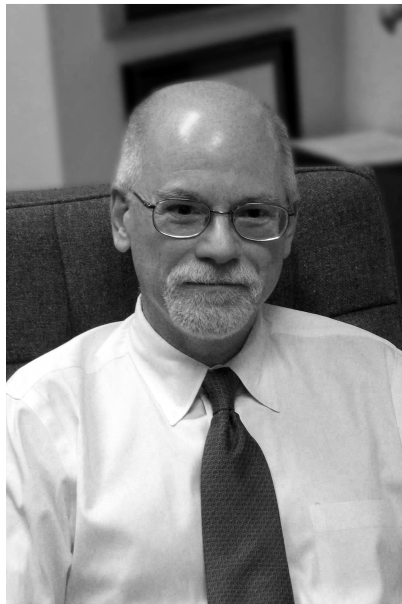
I hope you enjoy today's celebration of their experiences and accomplishments. These students' work, with the guidance of our dedicated faculty, is helping Weber State to grow as an institution of discovery and to create connections with our neighbors. As an institution, we appreciate both researchers and mentors for working to continue the tradition of scholarly achievement at Weber State.

*Welcome Message*



A handwritten signature in cursive script that reads "F. Ann Millner".

F. Ann Millner  
President



During any week of the year, WSU students can be found working with our faculty conducting pure and applied research. This experience prepares our students for the demands of careers and post-graduate education. The WSU Undergraduate Research Symposium provides an opportunity for our students to share their work.

This year marks the sixth year for the WSU Undergraduate Research Symposium. I am consistently impressed with both the breadth and quality of student research presented at the Symposium. Some of our students' undergraduate research has received national attention.

I congratulate our students for the quality of their work, and I extend my thanks to the many WSU faculty who devoted their time and effort to serve as mentors to our students as they pursued their research.

A handwritten signature in black ink, which appears to read "Michael Vaughan". The signature is fluid and cursive.

Michael Vaughan  
Provost

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## *Welcome Message*

As the Director for the Office of Undergraduate Research, it is indeed a pleasure to welcome you to the Sixth Annual Undergraduate Research Symposium and Celebration. This symposium celebrates both the scholarly, creative and research accomplishments of our students as well as the unique relationship between students and their faculty mentors. Faculty-student collaboration in the research process provides an opportunity for personal and professional growth that few other activities afford. Together, through active research and creative endeavors, our students and faculty explore the boundaries of their disciplines and together expand our realm of knowledge. The forging of this partnership enhances the potential of our students to think independently, creatively and critically.



*Welcome Message*

Today's event is a unique showcase for the talent and creativity of our students and their dedicated faculty mentors. These presentations are evidence that the pursuit of knowledge and creative expression are an integral part of the campus culture at Weber State University. Please join me in congratulating all the participants and celebrating their outstanding accomplishments. We hope that this symposium will inspire others to continue this form of profound learning and intellectual engagement.

A handwritten signature in dark ink, appearing to read "John F. Cavitt". The signature is fluid and cursive.

John F. Cavitt  
Director of Undergraduate Research

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## *Task Force & Moderators*

### **Session Moderators**

Judy Elsley - Honors/English

Penée Stewart - Teacher Education

Kathy Sitzman - BIS/Nursing

Brian Chung - Zoology

Chris Hoagstrom - Zoology

### **Undergraduate Research Task Force**

Melvin Carr - Sponsored Projects, ex officio

John Cavitt, Chair - Zoology

Ken Cuddeback -  
Telecommunication & Business Education

Jeff Davis - Accounting

Judy Elsley - Honors/English, ex officio

Lauren Fowler -  
Psychology, ex officio, CUR Councilor

Therese Grijalva - Economics

Susan Hafen - Communication

Colin Inglefield - Physics

Lisa Largent - University Development

Susan Matt - History

Dan Magda -  
Mechanical Engineering Technology

Kathy Payne - Library, CUR councilor

Travis Price - Clinical Lab Science

Cori Segovia-Tadehara - Social Work

Penée Stewart - Teacher Education

Ryan Thomas - Associate Provost, ex officio

Viktor Uzur - Performing Arts

Michael Vaughan - Provost , ex officio

## Oral Presentation Schedule

Oral Presentation Schedule

	312	316	Ballroom C
11:45 AM	N/A	N/A	<b>Nathan Brown</b> Synthesizing Urine Formed Elements for Microscopic Analysis
12:00 PM	<b>Madelyn Jones</b> Standpoint Variables: Super-Mom or Obsessed Mom?	<b>Christian Francom</b> A Role for Microfibril-Associated Glycoprotein-2 in Wound Repair	<b>Quinn Bate</b> The Effects of High Ionic S Solution on Platelet Storage
	<b>Holly Rawson</b> Women's Studies	<b>Jacob C Wood</b> The Comparison of Intestinal Amino Acid and Peptide Transport on Growth and Development	<b>Andy Baggs</b> Blood Culture Processing and the Effects on Time to Positivity
12:30 PM	<b>Shawn N. Thompson</b> Perceived Cultural vs. Moral Similarity: Effects on Out-Group Prejudice	<b>Todd Gilbert</b> The Efficacy of Dietary Fiber and Prebiotics on Intestinal Recovery	<b>Mark L Westbroek</b> Inhibitory Effects of Lactobacilli on Pathogenic Streptococcus pyogenes

12:45 – 1:15 Break with Refreshments

	<b>312</b>	<b>316</b>	<b>Ballroom C</b>
<b>01:15 PM</b>	<b>Adam Rosenberg</b> The Junction City Big Band	<b>Casey Johnston</b> Survival of Escherichia coli in Bruised Apples and Salmonella Enteritidis in Tomatoes.	<b>Austin Toupin</b> Optimus Primers
	<b>Janice LeFevre</b> Woods Cross Canning Company: Vital Davis County Industry	<b>Nathan V. Holmes</b> Ecomorphological Relations Between Cottus(i) Species and Their Environment in Northeastern Utah	<b>Andrew Hart</b> Effect of Centrifugation on Microalbumin Testing in Urine
<b>01:45 PM</b>	<b>Randy Bass</b> The Bikers at Angelo's Bar	<b>Cheyenne Church-Herland</b> The Migration of Plants and Culture: The Presence of Traditional Mexican and Central American Medicinal Plants in the Latin Markets of Ogden	<b>Chelsie Buckner</b> Prolonging Reconstituted Coagulation Controls' Stability with the Addition of Trehalose
	<b>Jason R. Swift</b> General Anxiety, Depression, Social Anxiety, and Social Support: Prevalence and Comorbidity among College Students	<b>Meghan McCormick</b> Germination of Cypripedium parviflorum, (orchidaceae) Seeds Using Crude Soil Inoculum	<b>Aimal Aziz</b> Pediatric Reference Intervals for P1NP and CTx Bone Markers
<b>02:15 PM</b>	<b>Luke Embley</b> Let Me Check My Blackberry: Mobile Communication Strategies	N/A	<b>Claire Allred</b> Excessive Use of Dental Barriers
	<b>Linda Clement</b> Group Teaching 101	N/A	<b>Christy James</b> Decreasing Stat Turnaround Times with Stat Monitor Screen
<b>02:45 PM</b>	<b>Carli Neugebauer</b> Constructivism: Comparing the "Cognitive Complexity" of Communication, Business, and Mathematic Majors	N/A	<b>Robinett, Zachary</b> Depeglylation of Red Blood Cells in Clinical Situations Consistent with Transfusion

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# Poster Display Listing

#1 MaryAnn Brown

Mother/Daughter Relationships  
in the Twilight Series

#2 MaryAnn Brown

Expectancy Violations in  
In-Law Relationships

#3 Eric Turner

Reality in Visual Media Sources:  
A Study of Perceptions & Comparisons  
at Weber State University

#4 Hilary Felsted

Comfort Messages at the  
Time of Death: A Thematic Analysis  
of Common and Comforting Messages

#5 Jaime Frank

Urinetown: The Musical  
and KC/American College Theatre Festival

#6 Megan Hall

ACTF (Associated College Theatre Festival)  
Stage Management Display

#7 Tiara Wallgren

Urinetown, The Musical -  
Hair and Makeup Design

#8 Cliff Wallgren

Urinetown, The Musical -  
Lighting Design

#9 Ben Baker

The Male Beauty Myth

#10 Heidi Bauerle

A Teen's Guide To Health:  
Lessons on Exercise and Nutrition

#11 Lacey Booth

Lead and Mercury Analysis  
of Fish Oil Supplements

#12 Monica Linford

Science/Ceramic Workshop in  
an Ogden, Utah Middle School

#13 June Mercado, Elizabeth Nash,  
Camron Shekarforoosh,  
Lauren Stratton

Forgiveness in Relation to  
Marital Satisfaction

#14 Matthew Stringham

Can't Buy Me Love

#15 Rachael Anderson, McKenzie Beus,  
Kenneth Jeppesen, Bradi Petersen

She Loves Me, She Loves Me Not

#16 Kate Bevan

The Impact of Stress in  
Dual Student Couples

#17 Sarah Ramage

The Implications of Self-Graphing  
Reading Fluency

#18 Chris Adams, Randi Haynes,  
Alvin Rodgers, Benjamin Whicker

The Effects of Cleaning Methods  
on Bacterial Growth Using  
Self-Adhesive Electrodes in  
Rehabilitation Settings

#19 Tyson Salley

Spontaneous Pneumothorax in a  
Female Collegiate Tennis Player:  
A Case Report

#20 Angela D. Perkins, Laurel Petersen,  
Niki Lainer

Flexor Digitorum Profundus  
Rupture and Failed Surgical Repair  
in a Collegiate Football Player:  
A Case Report

#21 Laurel Petersen,  
Angela D. Perkins

Does cryotherapy aid the  
return to play following acute  
ankle sprains?

#22 Melissa Smith

Exercise and the Immune System

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#23 Vanessa Farris,  
Justin Longhurst,  
Jordan Hirschi

Microfracture Surgery in a Collegiate  
Football Player: A Case Study

#24 Summerhaze Lee

Self-Esteem Intervention for the  
Women at St. Anne's Center

#25 Heather Kofoed, et al

First Annual Hooper City  
Health and Safety Fair

#26 Cassie Olson

Comparison of Body Fat to the  
Frequency of Athletic Injuries

#27 Kira Hafen Westbrook

The Effects of Indiscriminable Contingencies on the  
Independent Work Completion and Accuracy of  
Students with Emotional and Behavioral Disorders

#28 Chelsea Buckwalter, Lindy Gale,  
Nicole Lewis

Parental Dental IQ

#29 Julie Christiansen, Denae Lemich

HPV and Oral Cancer:  
What Dental Professionals Need to Know

#30 Becky Jackson, Janet Johnson,  
Camille Shumway

Eating Disorders: A Study of  
High School Students' Awareness

#31 Rachelle Maass, Hyun Ah Choi

Analysis of Titanium Oxide in Liquid Paint  
by X-ray Fluorescence Spectroscopy

#32 Spencer Barrett, Rachelle Maass

Rapid Analysis of Tin in Zirconium  
Alloys by X-ray Fluorescence

#33 Brandon Burnett, Andrew Giles

Rapid Determination of Gold During Plating  
Operations by X-ray Fluorescence

#34 Ty Flint

Phosphate Removal

#35 Sara Summers

Observations of Weathering and  
Microbiological Alterations on the Surface  
of Calcite Buried in Arctic Soil

#36 Sonya B. Welsh, Kevin S. Severson,  
Lee M. Bartholomew

Constructing a Baseline Model of Alpine  
Wetlands of the Uinta Mountains

#37 Brandon Cassel

Antibiotic Susceptibility in Halophiles  
Found in the Great Salt Lake

#38 Karli Oberg, Christie Jensen,  
Adam Hutchinson, Trever Gray

Method Development to Study  
Lysogenization in Halophiles Isolated  
From the Great Salt Lake

#39 Benjamin Lewis,  
Kelly Thomasson

Evaluation of Soil Microbiota  
and Soil Chemistry in Competitive  
Success of Halogeton glomeratus

#40 Benjamin Lewis

Calcium oxalate crystals in leaves  
of Halogeton glomeratus

#41 Benjamin Lewis,  
Kelly Thomasson

Mycorrhizal Associations  
in Halogeton glomeratus

#42 Christy Cottrell

Preliminary metagenomic  
survey of bacteria associated with  
Great Salt Lake brine flies

#43 Adam Sessions, Corey Layton

Bacteriophage inhibits Erwinia  
carotovora, a well-known bacteria  
that causes potato spoilage

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# Poster Display Listing

#44 Alexander Villeda

Biodegradation and Biodeterioration of Hydrocarbon-Based Fuels by Enriched Microbial Consortia

#45 Jeff Jepperson

Effect of Selenium on the brine shrimp *Artemia*

#46 Natasha Neilsen

Phylogenetic analysis of the telomere-associated gene, HeT-A, in *Drosophila*

#47 Jared Green, Amiko Uchida, Sarah Ahmad, Ron Meyers, Franz Goller

Sexual Dimorphism of Syringeal Muscles in Songbirds

#48 Lucas K. Hall

Dietary Analysis of Two Snake Species on Antelope Island

#49 Michael Cranney

Morphological variation among humpback whitefish in interior Alaska

#50 Gregory Fryer

Wildfire in the Wildland-Urban Interface: Comparison of Pixel- and Object-Based Classifications Using High-Resolution Aerial Photography to Construct Land-Use Land-Cover Maps

#51 Joseph Jay

The Crossroads of the West: Intensive Level Survey and Documentation of Structures within Ogden's Historical Downtown District

#52 Kjerstin Myers

Democracy and Equality: An Examination of Nations in Respect to Women's Rights and Achievements in Society

#53 Christian Petersen

The Effects of Fatigue on Cognitive Inhibition, Susceptibility to Affective Conditioning and

#54 Kimberlee Taylor

Current Trends in Help-Seeking Behavior and Perceived Stress in a College Population

#55 Kimberlee Taylor

Education and Outreach at Weber State University: Brain Awareness Week

#56 Kimberlee Taylor

A Longitudinal Study of Adolescent Risk-Taking

#57 Jeff Davis

The Effects of Violent Video Games on Physiological Stress Response

#58 Nathan Taylor, Shawn N. Thompson, Sarah Wheelwright, Nicole E. Nordello, Samantha N. Burroughs

Framing on prejudice and predictability of personality traits on openness to diversity

#59 Nicole E. Nordello, Sarah R. Wheelwright, Shawn N. Thompson, Samantha N. Burroughs, Nathan Taylor

Cultural vs. Moral Diversity: Effects of Framing on Prejudice

#60 Samantha N. Burroughs, Nicole E. Nordello, Nathan Taylor, Shawn N. Thompson, Sarah R. Wheelwright

Personality Traits and Quality of Contact Predictive of Out-group Prejudice in Individuals Who Have Lived in Another Country

#61 Seleste Sanchez

Paradise Lost? The Island Nation of Nauru and the Three Spheres of Sustainable Development

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*College of Arts & Humanities*

*Abstracts - College of Arts & Humanities*



*Research is what I'm doing when I don't know what I'm doing.*  
*-Wernher Von Braun*

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# Abstracts

## **Constructivism: Comparing the “Cognitive Complexity” of Communication, Business, and Mathematic Majors**

*Carli Neugebauer (Susan Hafen)*

### *Oral Presentation Communication*

Jesse Delia’s theory of communication constructivism “seeks to explain individual differences in people’s ability to communicate skillfully in social situations” (Griffin, 2009, p. 97). Individuals who are “cognitive complex” are able to create person-centered messages and participate in sophisticated communication by using multiple constructs in message production. Being cognitively complex is beneficial in both professional and social-related situations. To identify individuals who are communicatively cognitive complex, Delia uses Walter Crockett’s Role Category Questionnaire as a tool (p. 97). The purpose of this pilot study is to compare the cognitive complexity of communication majors, business majors, and mathematic majors; and to note the differences or similarities of the findings, if any. Three classes of each major will be administered the Role Category Questionnaire. I have two hypotheses: Communication majors will score higher on the Role Category Questionnaires than the business and mathematics majors, and women will receive higher scores than the men.

## **Mother/Daughter Relationships in the Twilight Series**

*MaryAnn Brown (Becky Johns)*

### *Poster Presentation Communication*

The mother/daughter relationship has many complicated factors and is very influential in women’s lives. Popular culture can tell a great deal about the myths and realities regarding and facing this relationship. This study analyzes the bestselling Twilight book series for components of the mother/daughter relationship. Five mother/daughter characters/character pairs are present. Mother/daughter issues discussed include parentification, bitterness about infertility, adoption, cohesion, reasons for having a child, and not wanting to become a mother. The Twilight series appears to tell a great deal about these types of relationships.

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### **Expectancy Violations in In-Law Relationships**

*MaryAnn Brown (Colleen Garside)*

*Poster Presentation  
Communication*

Many people have in-law relationships that are less than productive and satisfactory. This study employs Expectancy Violations Theory in exploring the two different types of in-law relationships: a spouse's family of origin and the spouses of one's family of origin or procreation. Survey research of approximately 50 married participants provides the data for statistical analysis. This study is at a preliminary stage. Findings are hypothesized to reveal that the need for acceptance into the family of origin of one's spouse will lead to these family members having a higher reward valence, and expectancy violations perpetrated by these in-laws will be judged as more extreme (positive or negative) than the other type of in-laws.

### **Reality in Visual Media Sources: A Study of Perceptions & Comparisons at Weber State University**

*Eric Turner (Sheree Josephson)*

*Poster Presentation  
Communication*

Visual media sources are a dominant feature of today's society. They are used for entertainment, information, and as a distraction from day-to-day concerns. The TV is always on, the Internet is accessible 24 hours a day on devices that can be carried in a pocket or book bag, and there are thousands of print media messages constantly bombarding the eyes. The purpose of this study was to examine relationships between perceptions of Visual Media Sources (VMS) and variables including self-confidence, frequency of comparison to media figures, and degree of comparison with media figures. A ten-question survey was administered to 163 undergraduate students in a variety of classes and academic disciplines at Weber State University. Statistical analyses found that respondents who were more confident were also more likely to rate themselves to be attractive as or more attractive than figures in VMS. Respondents who compared themselves to media figures less frequently considered themselves to be more attractive than respondents who compared themselves more frequently. The difference between the male and female perception of reality in VMS was found to be insignificant. VMS were shown to be a pervasive source of influence on the respondent's reported sense of self-confidence and attractiveness.

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# Abstracts

## **Comfort Messages at the Time of Death: A Thematic Analysis of Common and Comforting Messages**

*Hilary Felsted (Colleen Garside)*

*Poster Presentation  
Communication*

Communication during a time of grief is often focused on comforting messages. This study evaluates and analyzes messages received from persons trying to comfort people experiencing grief. Eight interviews were conducted with people who had experienced the loss of a loved one. Research participants were asked to reflect on messages they received following their loss. Qualitative methodologies provided a framework for analyzing effective and ineffective comforting strategies. A thematic analysis revealed that common messages said to a grieving person are not always comforting. Participants agreed that actions such as attendance at a funeral, viewing, or graveside service were often more comforting than verbal messages. This study suggests people could learn effective comforting strategies to improve communication with people experiencing grief.

## **Let Me Check My Blackberry: Mobile Communication Strategies**

*Luke Embley (Mali Subbiah)*

*Oral Presentation  
English*

As an adjunct instructor of paramedics at Weber State University and a part time student in technical writing, I have used many mobile devices for various communication purposes. Blackberrys, iPhones and Palm Pilots are increasingly used for the purposes of communication in the workplace. With that convenience and variety of communication devices comes a lack of communication standards. The best way to Short Message Service, (SMS) E-mail or Instant Message may not be the same on all mobile devices. For example, Instant Messages work well on iPhones, but not so well on Blackberrys. The convenience of communication, afforded by the mobile devices, is problematic in some other ways. Important documents may be unreadable and lengthy E-mails are difficult to see on a two-inch screen. Professionals need to be mindful of the intended readers and how they will receive their information. The use of these new devices in communication calls for creative ways of crafting and delivering messages. The presentation will focus on (1) the increasing use of mobile devices for communication purposes in the workplace, (2) problems this technology is posing for clear communication and (3) strategies for creating effective written communication on mobile devices.

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## **Group Teaching 101**

*Linda Clement, Emily Inderrieden,  
Shing Yau Kai, Rosann Owen,  
Alyson Robinett, Whitney Wasden (Yu- Jane Yang)*  
*Oral Presentation*  
*Performing Arts*

Why should you consider doing group instruction? How can teachers incorporate group teaching into private studios? This session will focus on the discussions of the “dos” and “don’ts” of group teaching. The presenters will illustrate some essential principles of successful group teaching strategies and creative tactics by showing ample examples of video clip teaching with live narration. Come discover how you can successfully utilize fun music learning of group teaching in your studio without chaos!

## **Urinetown: The Musical and KC/American College Theatre Festival**

*Jaime Frank (Catherine Zublin)*

*Poster Presentation*  
*Performing Arts*

Special presentation of a complete design of the set for Urinetown: The Musical.

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# Abstracts

## **ACTF (Associated College Theatre Festival) Stage Management Display**

*Megan Hall (Catherine Zublin)*

*Poster Presentation*

*Department of Performing Arts*

This past fall semester, I served as Stage Manager for Weber State's production of Urinetown the Musical. The event pinnacled my experience in the Performing Arts Department. As Stage Manager, I was given the responsibility of overseeing all aspects of the production process. This included the opportunity to facilitate all components of the production (lighting, sound, costuming, cast and crew, etc.) and to be the instrument for strong collaboration and communication between all production elements. The knowledge I gleaned from the experience was immense, and could in no way be given to me by any other means. The production itself was a huge success, and the process was exceptionally smooth and precise, which proved me to be an organized, prepared, and all-together skillful stage manager.

This February 9th-14th, I am attending the American College Regional Theater Festival, which includes the National Stage Management Fellowship Competition, in Fullerton, California. I will be attending the conference with mentors and cohorts from the Performing Arts Department. The Kennedy Center American College Theater Festival, by its own description is "a national theater program involving 18,000 students from colleges and universities nationwide which has served as a catalyst in improving the quality of college theater in the United States...where theater departments and student artists showcase their work and receive outside assessment by KCACTF respondents."

Some of the goals of the American College Theater Festival are: "to encourage, recognize, and celebrate the finest and most diverse work produced in university and college theater programs; to provide opportunities for participants to develop their theater skills and insight; and achieve professionalism; and to improve the quality of college and university theater in America."

At the conference, I will enter the National Stage Management Fellowship Competition and give a presentation, complete with an exhibit, on my stage management experience. I will attend workshops in which I will benefit from being mentored by theater arts experts throughout the region and to research innovations in stage management and general theater techniques. I will also be given numerous stage management assignments for which I will have the opportunity to collaborate with other students and mentors, to develop and hone my craft, and to research and put into practice new management skills and techniques.

At the conclusion of the ACTF conference, I plan to have successfully represented our university in the stage management competition, and I plan to have deeply developed my skills and a profound knowledge in stage management and all other areas of theater production.

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**Urinetown, The Musical -  
Hair and Makeup Design**

*Tiara Wallgren (Catherine Zublin)*

*Poster Presentation  
Performing Arts*

Designer's Concept Statement

Urinetown is the debris left behind after a violent flood. The water is all gone, and the earth is dried up. However, there is garbage and muck lying around, lost to the original owners and abandoned in the dump. Urinetown is not only a city; it is not just a place. It is "our town, when we're hopeless, down, and out." Urinetown is a state of being, and each of the characters in this play exist within that state of mind. It is depression; it is angst; it is desperation; it is greed. It is what's left behind when the flood of human emotions have abandoned us, and we are left alone with our fear. What can we do with what's left behind, when it is all that we have? We improvise, work hard, and continue to make do.

The characters in Urinetown are hungry, tired, and need to pee. This is the perfect recipe for a revolution. Their desperation and fear are displayed on their faces; these emotions are the shadows on their faces, and the haunted look in their eyes. The difference between the poor population of Urinetown and the employees and benefactors of the Urine Good Company is a distinct one. The cold, calculating measures that these people have taken to rise to the top can be seen in the hard lines of their exhausted faces, and the pristine condition of their clothing and hair.

The cops are a violent gang of men and women who prey on the weak, and serve at the beck and call of the UGC. Although there are three worlds within the city limits of Urinetown, every citizen here is exhausted, desperate to pee, and afraid.

The only exceptions are Caldwell and Senator Fipp, who are crisply suntanned from their many trips to Rio del Rio.

In order to portray each of these worlds, the looks between the characters must be drastic and defined. However, the biggest challenge to overcome will be creating these various looks among the small group of ensemble members, and obeying the rules as set forth by the quick changes. Overcoming this obstacle will entail the use of many methods, including wigs for a variety of looks and changes, as well as hair products which enable the actor to swiftly change back and forth from different styles. The makeup will be extremely shadowed and utilize strong architecture and lines, and the shapes on the faces of the actors will change based on costumes, lights, and character expression from the actor.

The people of Urinetown have been circling the drain for some time, and are living among the sludge around them. They have made use of what they can to create clothing, and have incorporated elements of this garbage into their hair, as well as using mud and other substances for hair product.

Each of these objects is a representation of the characters' past occupations, and can be seen in the unraveling of the human underneath all the grit and grime.

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# Abstracts

## **Urinetown, The Musical - Lighting Design**

*Cliff Wallgren (Catherine Zublin)*

*Poster Presentation*

*Department of Performing Arts*

As the lighting designer for Urinetown, The Musical, I was challenged with the question of how to effectively portray a run down waste land of a town and then take that environment and turn it into the downward depths of the towns sewer system, and on top of all that there still needed to be the environment of the finely polished diamond of the “Urine Good Company” which was the headquarters where all the filth and grime of the city was created through political decisions, and especially how to visually communicate these differences without taking the characters away from their world in the play. I investigated many methods and representations, of creating these scenarios with the use of cretin angles, colors, and textures of light to create the visual atmospheres and to support the other design elements and bring them all together into one cohesive world for the actors to take as their own.

The goal for this project at WSU was to effectively communicate the vast difference between the “town”, the “sewer”, and the “great wealthy empire” of this fictional town to an audience by visual representation. In collaboration with the design team for this production, we aimed to research and develop a design concept that would be not only visually stimulating but also be a realistic and safe environment for the performers to tell their story to the audience.

In sharing and discussing this concept to other designers and respondents at the American College Theatre Festival, I hope to continue to develop my skills and abilities in effective design representation, as well as the ability to effectively communicate design concepts to an audience during an oral presentation for designers. The objective of attending the Kennedy Center American College Theatre Festival is to further develop my theatre skills and insight, and to develop my own personal professionalism in the field of theatrical design, with an emphasis in lighting design. I will be given the opportunity to share my insights for the design process that took place for Urinetown, as well as learn and collaborate with other student designers from within the theatre community and to work on building future professional contacts. I will have the chance to share my process and concept with student and professional designers. I will also be able to attend workshops, feedback responses, and a design gallery that will allow me to investigate and research other designers’ approaches and effective methods of design communication. The overall intended outcome in attending this conference is to become a more professional and more diversely experienced theatre professional, and to gain the opportunity to advance to the national level and represent Weber at the Kennedy Center in Washington DC. The workshops and presentations I will attend offer countless and vital information, and will equip me with skills I need to widen my own personal approach and development as a designer.

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*John B. Goddard School of Business & Economics*

*Abstracts - School of Business & Economics*



*Research is formalized curiosity. It is poking and prying with a purpose.  
-Zora Neale Hurston*

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# Abstracts

## **Paradise Lost? The Island Nation of Nauru and the Three Spheres of Sustainable Development**

*Seleste Sanchez  
(Shane Schvaneveldt)*

*Poster Presentation  
Sociology/Anthropology*

Sustainable development is defined as "...development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (U.N. Brundtland Report, 1987). The sustainability of a society must be understood in terms of three spheres: economic, environmental, and social. As a case study of the issues of sustainability, this project examines the island nation of Nauru, a country near the equator in the Pacific region. Despite its small size, Nauru once enjoyed being one of the richest island nations in the world. This surge in the economy was due to the mining of phosphate deposits, which led to a change from a subsistence economy to a cash economy. As the islanders grew reliant on the substantial royalty checks that came from the mining of phosphate, many traditions were lost and various social changes followed. Today, the majority of the island's natural environment has been destroyed by the mining of phosphate and the deposits are nearly depleted. Consequently, Nauru faces an uncertain future in terms of its society, economy and natural environment.

*Weber State University*  
*Sixth Annual Undergraduate Research Symposium*

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*Bachelor of Integrated Studies*

*Abstracts - Bachelor of Integrated Studies*



*If we knew what we were doing it wouldn't be research.*  
*-Albert Einstein*

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# Abstracts

## The Male Beauty Myth

*Ben Baker (Rod Hansen)*

*Poster Presentation  
Interdisciplinary*

As anabolic steroid and muscle-enhancing supplement use increases, the question of male body image perception arises. This study was used to determine how male's view themselves, and to what extent they are willing to go to achieve their definition of 'optimal'. A three-part survey was constructed. Section A indicated the participants' current perception of themselves, with B indicating their opinion of an ideal image. Pictures to select were identical in sections A and B. Section C included questions for overall health and tested knowledge of performance-enhancing drugs. Twenty-five multiple-choice questions completed the survey. Surveys were distributed to all demographics via personal solicitation in the Ogden area and WSU classes. Completed totals had 163 surveys. All data had marked changes at the age of 26. Most participants selected pictures of professional athletes as ideal. When asked if satisfied with current physical appearance, ages 26 and up said yes 44% of the time, while ages 15-25 had 84%. It is very possible the results regarding anabolic steroid use appeared as they did because of the individual groups surveyed. With 67% of all admitted steroid users being members of Gold's Gym, this changed the results as a whole.

## A Teen's Guide To Health: Lessons on Exercise and Nutrition

*Heidi Bauerle (Rodney A. Hansen, Molly Smith,  
Michelle B. More)*

*Poster Presentation  
Chemistry, Exercise Science, Nutrition*

Childhood obesity is epidemic in the United States. Between 1980 and 2006, obesity in children and teens has risen from 5% to 18% and continues to rise. Childhood obesity predisposes children to later health problems, and the potential for devastating social discrimination, low self-esteem, and depression. This study investigated: 1) If teens receive a greater amount of education about health and are given information on how to make healthy lifestyle choices, will they intend to make those choices? 2) Do teens learn more about health habits from hands-on experiences, or from lectures? Three pre-tests were given that addressed reading a food label, making healthy choices, and personal dietary intake. Identical post-tests were given at the conclusion of the class unit. To determine whether students learn better from hands on experiences or lectures, two separate classes were used. Class A was given the opportunity to participate in the activities for the lessons. Class B simply had to sit and watch for the entire unit. The study determined that students do incorporate healthier lifestyle choices when given a greater amount of education. Hands on experiences or lectures did not make a significant difference in how the students learned the material.

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**Lead and Mercury Analysis of  
Fish Oil Supplements**

*Lacey Booth (Rodney Hansen, Barry Lloyd,  
Michael Olpin)*

*Poster Presentation  
Nutrition, Chemistry, & Health Promotions*

Past research has shown that fish oil supplements may contain heavy metals that could affect human health. Heavy metals, such as mercury and lead, are particularly concerning based on their toxicity. In this project, ten different brands of fish oil supplements were tested for lead and mercury content by an Inductively Coupled Plasma Mass Spectrometer (ICP-MS). The objective of this research was to compare the brands of fish oils in terms of heavy-metal contamination to determine which brand (if any) was cleanest. A survey was also created and administered to health students at Weber State University to determine current trends in nutritional-supplement usage. This survey focused specifically on the subjects' intake of fish oil supplements in the diet, as well as the subjects' concern for heavy-metal contamination. After analyzing both the chemical and surveyed data compiled in this project, it is evident that consumers should not be concerned with heavy-metal contamination in fish oil supplements. Based on the low concentrations of Pb and Hg that were measured, fish oil supplements may provide a healthy means of consuming omega-3 fatty acids in the diet.

**Science/Ceramic Workshop in an Ogden, Utah  
Middle School**

*Monica Linford (John Mull)*

*Poster Presentation  
Zoology*

In order to integrate three areas of emphasis—zoology, art, and education—into a Bachelor of Integrated Studies Capstone Project, I conducted a science/ceramic workshop at Middle Ogden Preparatory Academy in Ogden, Utah. The workshop involved teaching the physiology, habitat, and behavior of the bald eagle (*Haliaeetus leucocephalus*), the mascot of the middle school. My hypothesis was that teaching science in an integrated art/science activity would increase interest in science and scientific careers. Participating students constructed a 3' by 5' stoneware tile mural illustrating a bald eagle and the scientific facts they learned. Surveys conducted at the beginning and end of the workshop assessed the student's attitudes toward science and scientific careers. A satisfaction survey was also given. The students participated in presenting the finished mural to the school. The surveys indicated a high level of interest in science among the students at the outset, which remained relatively constant, and tremendous enjoyment and support of the workshop with a feeling of pride in the finished product. This enthusiasm suggests that the children viewed the participation as a significant event, that when paired with science learning, may have a positive impact on their perception of science as a course of study.



*Weber State University*  
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*Jerry and Vickie Moyes College of Education*

*Abstracts - College of Education*



*After all, the ultimate goal of all research is not objectivity, but truth.*  
*-Helene Deutsch*

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# Abstracts

## Forgiveness in Relation to Marital Satisfaction

*June Mercado, Elizabeth Nash, Camron Shekarforoosh, Lauren Stratton (Paul Schvaneveldt)*  
*Poster Presentation*  
*Child and Family Studies*

The purpose of this study was to explore the effect of behavioral forgiveness and the specific manner of expression of apology on marital satisfaction. No known study has examined how the language one uses in apologizing for misdeeds impacts marital satisfaction and forgiveness. One hundred and forty one participants from seventeen different states completed a questionnaire measuring their forgiveness behaviors after a disagreement, their overall marital satisfaction, and their language of apology style. The participants who expressed having higher levels of positive forgiving behavior also expressed having higher levels of marital satisfaction. This study also found that individuals who express regret with an acceptance of responsibility also engaged in greater levels of behavioral forgiveness and subsequently higher levels of marital satisfaction.

## Can't Buy Me Love

*Matthew Stringham (Paul Schvaneveldt)*  
*Poster Presentation*  
*Child and Family Studies*

The Love Language Theory postulates that couples report greater levels of marital satisfaction when one's preferred method of receiving love messages is matched with the spouse's manner of expressing love (Chapman, 2002). This research project tested the hypothesis that receiving love in one's preferred love language from their significant other would predict higher levels of marital satisfaction, compared to couples who had a mismatch in receiving expressions of love from their partner and their preferred love language. A matched love language was identified as receiving expressions of love from one's partner and also reporting this expression of love as one's love language. A sample of 54 married or cohabiting couples was studied. Marital satisfaction was measured by the Dyadic Adjustment Scale (Hunsley, et al., 2003) and the Measures of Expressions of Love scale (Goff, Goddard, Pointer, Jackson, 2007). Partial support was found for the hypotheses. Implications for practitioners are discussed.

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### She Loves Me, She Loves Me Not

*Rachael Anderson, McKenzie Beus, Kenneth Jeppesen, Bradi Petersen (Paul Schvaneveldt)*

*Poster Presentation  
Child and Family Studies*

Chapman (2002) suggested that there are five primary love languages or manners of expressing and receiving messages of love. The five languages are: words of affirmation, quality time, physical touch, gift giving, and acts of service. Chapman also postulated that marital satisfaction increases as one expresses love to one's partner in his or her primary love language. This study examined the ways couples communicate love to one another as related to marital satisfaction. Surprisingly, little empirical research has been done to verify Chapman's theory. To test Chapman's theory a convenience sample was taken of married individuals ranging in age from 18 to 70. The questionnaire was composed of questions derived from a love-expression-rating list compiled by Goff, Goddard, Pointer, and Jackson (2007), a Likert scale, and a Seven-Item Short Form Dyadic Adjustment Scale to measure marital satisfaction. Four of Chapman's five love languages proved to increase marital satisfaction when being expressed. The only love language that had no effect on marital satisfaction was gift giving, it was not found to relate to satisfaction. It was also found that regardless of the preferred love language, if any form of love language was shown, besides gifts, then marital satisfaction was higher.

### The Impact of Stress in Dual Student Couples

*Kate Bevan (Paul Schvaneveldt)*

*Poster Presentation  
Child and Family Studies*

This study examined the stressors facing dual student couples and their marital satisfaction. Previous studies have focused on relationship satisfaction in many contexts, but few have examined this topic in which both partners are university students. Many students at Weber State University are involved in dual-student situations. A sample of 108 married or cohabiting students, whose partners were also students, were studied. The purpose of the study was to examine the influence of outside factors such as time constraints, financial pressures, parenting demands, paid employment, school requirements, and demographic factors in understanding marital satisfaction. It was hypothesized that a contagion of multiple stressors would negatively impact negatively relationship satisfaction. Furthermore, those individuals in a dual student situation would report high levels of stress from these external factors. Partial support for these hypotheses were identified. The major finding was that a greater number of external stressors negatively impacted relationship satisfaction, although not all dual student couples reported lower levels of marital satisfaction.

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# Abstracts

## **The Implications of Self-Graphing Reading Fluency**

*Sarah Ramage (Natalie Williams)*

*Poster Presentation  
Elementary/ Special Education Comp.*

This poster presentation will display the results of a self-graphing intervention using a multiple baseline design. The participants involved in the project were elementary-aged students with behavioral disorders. The dependant variable was the number of correct words per minute. Each student completed a one minute timing to determine fluency rate. The independent variable was the method used to graph student performance. The intervention involved the researcher initially graphing student performance without allowing the students to visually observe the results. As students were moved into intervention, they graphed their own performance electronically and were able to visually assess their own performance. One student averaged an error rate of 11.71 prior to intervention. During intervention this student averaged an error rate of 5.36. This same student averaged 23.00 words per minute correct prior to intervention, and 26.54 words per minute correct once the intervention was in place. Complete student data will be present during the poster session. The authors will present all student data, teacher comments on the intervention, and suggestions for future research in an applied setting for students with behavioral disorders.

## **The Effects of Cleaning Methods on Bacterial Growth Using Self-Adhesive Electrodes in Rehabilitation Settings**

*Chris Adams, Randi Haynes, Alvin Rodgers,  
Benjamin Whicker (David Berry)*

*Poster Presentation  
Health Promotion & Human Performance*

Background: Physical therapy clinics across the country use various therapeutic modalities to aid in the healing process. One of these widely used modalities is electrical stimulation (e-stim), a form of electrotherapy. E-stim is administered through electrical impulses sent into the body via electrodes. There are several types of electrodes that are used including carbon-based, silver, and self-adhesive. The self-adhesive electrodes are the most widely used for their multi-use and convenience. They have the conductive gel on the electrode and stick to the skin where placed. In many clinics, these electrodes are used on multiple patients in a given day. There are some cases where these electrodes are used for a month at a time with no regard to the patients and possible surgical sites. There are a few different ideas on the best sanitization methods of these electrodes. The best and most effective method is rarely experimented with or not even considered. Objective: The purpose of this study is to examine the effects of sanitization methods on inhibiting bacterial and viral growth on self-adhesive electrodes used during electrotherapy in outpatient rehabilitation settings. Methodology: A two-day trial consisting of three sets of four electrodes. Each set was used on five patients per day for two days for a total of 10 exposures. Treatment time for electrodes on skin surface was 15 minutes.

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**Spontaneous Pneumothorax in a Female Collegiate Tennis Player: A Case Report**

*Tyson Salley (David C. Berry, Nancy Weir)*

*Poster Presentation  
Health Promotion and Human Performance*

Experimenter washed hands with antimicrobial soap before electrode placement and after treatment time completion. Hands were washed in hot water and scrubbed for 30-45 second before rinsing, and dried with paper towels. The first group was the control where the electrodes were not cleaned in any way. Electrodes were placed in a zip-lock bag between uses. The second group was cleaned using a UV-C (Ultra-Violet C waves) wand. Each electrode was waved by the wand for 20 seconds within 1 inch of the surface. This procedure done after each use. The third group was cleaned using 70% isopropyl alcohol wipes. Each electrode was wiped for 30 seconds then placed in a zip-lock bag between uses. Within 36 hours of last treatment, pads were refrigerated and then cultured for MERSA (staphylococcus), fecal matter, and for general growth. All cultures were examined by the Weber State University Microbiology Department. Results: Results will not be present at time of abstract submission but will be present for project submission.

Objective: To present the case of an intercollegiate tennis player with a right spontaneous pneumothorax, and the clinical decision making necessary in the evaluation, management, intervention, and rehabilitation of this athlete. Background: An 18-year-old female intercollegiate tennis player presented with signs and symptoms typical of a right costochondral separation while playing tennis. Approximately 2 ½ hours after the initial presentation of pain, she became acutely short of breath. Emergency room radiograph demonstrated large right tension pneumothorax. No history of trauma, infection, or previous injury was noted. Differential Diagnosis: Intercostal strain, costochondral separation, pneumothorax, pulmonary embolus, asthma. Treatment: A chest tube was placed into the lung to relieve the pneumothorax. Post-insertion radiographs showed adequate re-expansion of the lung. In the following days several leaks in the pleural cavity were noted and a right thoracoscopy was performed. During the procedure apical pleural blebs and fibrotic plaque were identified. No leaks were noted after the thoracoscopy. Uniqueness: The findings of a spontaneous pneumothorax with no significant trauma are very rare with no known cases in an athlete participating in a low impact sport like tennis. Conclusions: Increased clinical awareness is necessary when assessing thorax pain and breathing difficulties, including the use of auscultation even in non-traumatic situations.

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## Abstracts

### **Flexor Digitorum Profundus Rupture and Failed Surgical Repair in a Collegiate Football Player: A Case Report**

*Angela D. Perkins, Laurel Petersen, Niki Lainer  
(David Berry, Joel Bass)*

*Poster Presentation  
Health Promotion and Human Performance*

Objective: To present the case of a football player who sustained a flexor digitorum profundus (FDP) tendon avulsion and surgical repair. Background: A 20-year-old male collegiate football wide receiver experienced a closed FDP tendon rupture at the A2 pulley level after experiencing blunt trauma to the right 4th digit. Initial care was delayed 2-3 weeks because the athlete believed he merely “jammed” his finger. Differential Diagnosis: Interphalangeal joint dislocation, phalanx fracture, or flexor digitorum superficialis avulsion. Treatment: The athlete underwent a FDP repair using the palmaris longus due to the initial delay in care. Three months later the athlete was diagnosed with a failed FDP reconstruction with superficialis tendon adhesions and loss of 4th distal and proximal interphalangeal joint motion. Uniqueness: The mechanism of injury was atypical and the athlete’s ability to tolerate pain delayed the initial care. During surgery, it was discovered the involved tendon died two weeks prior, requiring a palmaris longus graft despite a high failure rate. Postoperatively, the athlete has lost the ability to flex not only the distal interphalangeal joint, but the proximal joint as well. Conclusion: Immediate and proper assessment procedures are necessary in determining the injury pathology and whether surgical intervention is needed.

### **Does Cryotherapy Aid the Return to Play Following Acute Ankle Sprains?**

*Laurel Petersen, Angela D. Perkins  
(David Berry)*

*Poster Presentation  
Health Promotion and Human Performance*

Clinical Problem: Clinicians constantly examine the literature to determine best practice methods, particularly related to cryotherapy. The following evidence-based medicine paper reviews the results of a systematic review. Clinical Question: Does cryotherapy aid the return to play following acute ankle sprains? Data Sources: Studies were identified through a literature search on cryotherapy using five databases: MEDLINE, Physiotherapy Evidence Database, SPORTDiscus, Cochrane Review and CINAHL from 1976 to 2003. Search terms included cryotherapy, return to participation, cold treatment, ice, injury, sport, edema, and pain. Study Selection: Study inclusion criteria included: being published in the English language, randomized clinical trial on humans, and had to examine the effects of cryotherapy on return to sport participation and return to work. They had to be controlled clinical trials that assessed the effect of cryotherapy that did not examine the effects on return to participation. Conclusions: Cryotherapy has a positive effect on return to participation despite the lack of significant evidence that was supported by two of the clinical trials. The trials demonstrated a trend of improvement. However, more studies need to be conducted on the effect of cryotherapy alone and not in conjunction with other therapeutic agents.

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**Exercise and the Immune System**

*Melissa Smith (Michael Olpin)*

*Poster Presentation*

*Health Promotion and Human Performance*

The purpose of this study was to see if there is a relationship between how often a person exercises and how often he or she becomes sick. Exercise offers many health benefits, but is immune protection one of them? Evidence shows that people who engage in physical activity get sick less often (Nieman, 2001). However, these studies have primarily used elite athletes as their subjects. There has been insufficient analysis of those who perform regular but only moderate amounts of exercise (Kaufman, 1994). A survey was distributed to 100 college students enrolled in general education classes at WSU. It consisted of eight questions asking the students about the duration and frequency of their cardiovascular exercise sessions as well as the duration and frequency of their illnesses. A correlation analysis showed that those who exercised more reported experiencing colds and the flu less often than their less active peers. The duration of their colds was also shorter. However, specifically regarding the flu, students who exercised less frequently reported their flu symptoms lasting a shorter duration. It appears that students who exercise regularly at a moderate intensity seem to get sick less frequently than those who don't.

**Microfracture Surgery in a Collegiate Football Player: A Case Study**

*Vanessa Farris, Justin Longhurst, Jordan Hirschi (David Berry)*

*Poster Presentation*

*Health Promotion and Human Performance*

**Objective** To present the case of a collegiate football player with a microfracture surgical repair to the knee during an Anterior Cruciate Ligament (ACL) and lateral meniscus repair. **Background:** A 20-year old male collegiate football player suffered a 3rd degree ACL sprain and lateral meniscus damage to the left knee during practice. **Differential Diagnosis:** Osteochondritis dissecans, chondral fracture, osteophytes. **Treatment:** In April 2008, the ACL was repaired and a microfracture surgical technique was performed to stimulate new cartilage growth to replace damaged articular cartilage. In October 2008, a second procedure to remove the screw securing the ACL graft and secure the "pseudo-cartilage" formed during the first microfracture surgery was performed. A second microfracture repair was completed due to the lack of articular cartilage growth from the first procedure. **Uniqueness:** Microfracture surgery has a 75% success rate with athletes returning to sport in approximately 4 months. In this case, the procedure was performed 6 months later due to pain and inadequate cartilage growth. **Conclusion:** The effectiveness of cartilage growth after microfracture surgery is dependent upon intrinsic and extrinsic factors. And while clinicians cannot control intrinsic factors, they can control extrinsic factors such as weight bearing, range of motion and functional status.

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# Abstracts

## **Self-Esteem Intervention for the Women at St. Anne's Center**

*Summerhaze Lee (Patricia Cost)*

*Poster Presentation  
Health Promotion and Human Performance*

St. Anne's Center is a homeless shelter in Ogden, Utah that serves men, women, and families who find themselves in crisis. The center offers shelter, food, showers, and programs that aid people in getting off the streets. My primary focus was on the women who were staying at the shelter. I offered them self-esteem classes, which worked to bring the women together for educational purposes. Ten women were surveyed and also participated in focus groups to determine the demographics and desires of the group. The group was diverse in that everyone had a distinct background and circumstance. From the data, it was concluded that the women wished to address issues with appearance, coping, and budgeting skills. Three 60-minute sessions were developed and administered to meet these needs. Participation was high with eight to ten women attending one or more of the three sessions.

## **First Annual Hooper City Health and Safety Fair**

*Heather Kofoed, et al (Patricia Cost)*

*Poster Presentation  
Health Promotion and Human Performance*

The Hooper City Health and Safety Fair was organized and implemented using the Precede/Proceed model. A community description was done, and information was gathered and analyzed. A six-question survey was created and a SMOG test confirmed the reading level at sixth grade. The survey was presented at city council meeting and a city employee luncheon where participants, 23 total, completed the survey. The results indicated all were interested in having a health and safety fair. Members of the community were contacted and asked to provide a booth for the fair. Twenty-seven different booths were confirmed for the fair. After initial contact, phone calls were made to vendors to reconfirm attendance. Following the phone contacting, letters were sent two weeks prior to the fair describing set-up arrangements, directions, and other specifics. The set-up and participation in the health and safety fair went well. Vendors were given evaluation forms and the majority were pleased and claimed they would participate in the annual event. Each participant filled out an evaluation before leaving and most were impressed and would attend another fair. Letters were sent out to the vendors at the fair to thank them for their time and expertise. Finally, after planning, implementing, and evaluating the first annual health fair for November 18, 2008, it was deemed successful based on a sound planning model and community participation.

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**Comparison of Body Fat to the Frequency of Athletic Injuries**

*Cassie Olson (Rod Hansen)*

*Poster Presentation  
Nutrition*

This pilot study investigated the relationship between body fat percentage as compared to the frequency of overuse injuries in what consisted mainly of endurance athletes. It was hypothesized that when body fat was low (<10%), frequency of overuse injuries would increase. A survey was distributed to 35 collegiate athletes that were primarily endurance athletes. Body fat was measured using a 3-fold skin caliper. Subjects were divided into three groups: subjects <10% body fat, 10-15% body fat, and >15% body fat. These groups were based on the body fat percentage categories used at the McKay Dee Cardiac Fitness Institute. The data was analyzed using a One-Way ANOVA. The results were not statistically significant, however, there were some interesting trends; in that the 10-15% group showed the lowest frequency of injuries.

**The Effects of Indiscriminable Contingencies on the Independent Work Completion and Accuracy of Students with Emotional and Behavioral Disorders**

*Kira Hafen Westbroek (Natalie A. Williams)*

*Poster Presentation  
Teacher Education*

This research describes the use of indiscriminable contingencies (IC) in a classroom of elementary students with behavioral disorders. The dependent variable was the accuracy and completion of an independent seatwork assignment, also known as self-start. The independent variable was an IC, determined by the number rolled on a pair of dice. This study attempted to answer the question: What are the effects of IC on the independent work completion and accuracy for students with behavioral disorders? The study implemented a single-subject reversal design using a visual analysis of the data to interpret the results and potential success of the IC as a successful classroom intervention.



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*Dumke College of Health Professions*

*Abstracts - College of Health Professions*



*By seeking and blundering we learn.*  
*-Johann Wolfgang Von Goethe*

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# Abstracts

## **Prolonging Reconstituted Coagulation Controls' Stability with the Addition of Trehalose**

*Chelsie Buckner, Natalie Heath, Mechelle Sargent, Satoko Yamamoto (Kara Hansen-Suchy)*

*Oral Presentation  
Clinical Laboratory Science*

The objective of this research was to attempt to prolong the working shelf-life of lyophilized coagulation controls used by medical laboratories, by adding a unique sugar molecule called trehalose during reconstitution. Trehalose was chosen for this study because it has previously been shown to protect proteins from denaturing, and coagulation controls are protein-based. According to the manufacturer, current coagulation controls have a reconstituted shelf-life of only 8 hours. 182 samples of Level 1 and Level 3 controls with trehalose were run alongside a set of Level 1 and Level 3 controls without trehalose at 10 different time intervals throughout a 72 hour period. In addition, 182 outdated Level 1 controls from a different company were also run during the same time intervals. This study illustrated that adding trehalose to the lyophilized coagulation controls demonstrated no statistical difference in prolonging the reconstituted coagulation control values. However, the data did show that reconstituted coagulation controls are stable much longer than the manufacture's recommendation of 8 hours, and the lyophilized shelf life of controls can also be extended beyond the stated expiration date. Implications of these findings imply less waste of coagulation controls leading to significant monetary savings for medical laboratories.

## **Pediatric Reference Intervals for P1NP and CTx Bone Markers**

*Aimal Aziz, Michelle Compton, Scott Hunter, Ashley Prothero (Scott Wright, Janet Oja)*

*Oral Presentation  
Clinical Laboratory Science*

This project deals with the hypothesis that pediatric reference intervals for several bone markers are different from adult reference intervals. Bone markers are bone-derived molecules that reflect bone remodeling activities. They are divided into two groups: bone formation and bone resorption markers. The measurement of bone markers is helpful in the diagnosis of skeletal disease as well as in monitoring treatment in children. Children have extremely high rates of skeletal growth compared to adults and therefore likely have higher concentrations of bone remodeling markers. The focus of this research project is on procollagen type 1 N-terminal peptide (P1NP), which is a marker of bone formation and C-terminal cross-linked telopeptide of type I collagen (CTx), which is a marker of bone resorption. Testing will be performed on samples from children 7 to 17 years of age, as well as on adult samples using both FDA approved and non-approved methods. Pediatric reference intervals will be determined and compared to reference intervals established using a control group of adult specimens.

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### **Effect of Centrifugation on Microalbumin Testing in Urine**

*Andrew Hart, Deborah Billas, Aaron Bradbury  
(Leonard G. Nielsen)*

*Oral Presentation  
Clinical Laboratory Science*

In clinical laboratories throughout the U.S., detailed Standard Operating Procedures (SOPs), are written and strictly adhered to by laboratory personnel in order to ensure the highest quality of patient testing. It is rare to find any discrepancy in these laboratory procedures. However, upon review of several SOPs for microalbumin testing in local clinical laboratories, inconsistencies exist regarding the need for centrifugation of the urine sample. The objective of this research project is to determine the difference, if any, in the measurable amount of albumin in urine between a centrifuged specimen and one that is not subjected to centrifugation. To test this we take urine samples measuring positive for microalbumin (the presence of albumin in urine). The sample is assayed one time uncentrifuged and well mixed. An aliquot of the same sample is centrifuged and also tested. The results are then statistically analyzed for any significant difference between the two methods. Should centrifugation prove to be unnecessary, ten minutes of time and effort may be saved in the specimen processing stage for each sample. This will result in faster turn around times and make the tests much more profitable for the laboratory.

### **Blood Culture Processing and the Effects on Time to Positivity**

*Andy Baggs, Joshua Hastings, Minh Vu  
(Scott Wright)*

*Oral Presentation  
Clinical Laboratory Science*

This research will determine if there is a significant difference between the current processes of “collection then incubation” vs. “collection, transportation, then incubation” of patient blood cultures collected from three Intermountain Healthcare clinical laboratories. Utah Valley Regional Hospital in Orem, Utah collects their blood cultures and then immediately incubates them on-site and transports any positive cultures to the Intermountain Medical Center’s central laboratory in Murray, Utah for further work-up. Meanwhile, McKay Dee Hospital in Ogden, Utah collects the blood culture bottles and transports them to the Intermountain Medical Center’s central laboratory for incubation and further work-up if needed. The average distance between these two locations to the central laboratory is thirty-seven miles with a travel time of roughly forty-five minutes. Eight months of positive blood culture data from IHC was collected and will be analyzed using Chi-squared method to determine if there was a statistically significant difference between the two facilities.

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# Abstracts

## **The Effects of High Ionic Strength Solution On Platelet Storage**

*Quinn Bate, Aaron Roane, Kyle Fusselman  
(William Zundel)*

*Oral Presentation  
Clinical Laboratory Science*

Currently, therapeutic platelet components are stored at room temperature on a rotating device to maintain a state of continuous motion until ready for transfusion; this motion keeps the platelets from aggregating. In blood-bank in vitro testing procedures, a 0.03 M low ionic strength solution (LISS) is used to decrease the zeta potential surrounding red blood cells (RBCs). LISS allows the red blood cell membranes to come closer together, thus enhancing agglutination of RBCs. We propose that suspending donor platelets in a high ionic strength solution (HISS) [0.9 - 1.0 M] will increase the net zeta potential around each platelet maintaining or increasing the distance between adjacent platelet membranes. We postulate that saturation of the platelets with HISS will inhibit platelet aggregation for the duration of storage (five days), allowing storage of donor platelet components without agitation. To quantify our findings, viability of platelets will be measured with 4% Typan Blue viability stain. Platelets with membrane damage will uptake the stain, letting us determine a ratio of viable to damaged platelets and compare the two populations: agitated and at rest. Our hypothesis is that the HISS treated platelets at rest will have an equal or higher viability ratio than the platelets being agitated.

## **Synthesizing Urine Formed Elements for Microscopic Analysis**

*Nathan Brown, Brynn Van Dyke,  
Chrishell Woodruff (Travis Price)*

*Oral Presentation  
Clinical Laboratory Science*

Obtaining formed elements in urine for microscopic analysis is necessary in clinical laboratory science education; however, the rarity of some of these elements and the difficulty of acquiring clinical samples due to HIPAA laws can limit sample accessibility. Artificially creating urine with the desired elements can offer CLS programs a viable alternative to collecting patient samples. The major aim of this study was to develop protocols on how to create these formed elements. To do this, we surveyed other laboratory science programs, compiled various procedures and methodologies, and made our own preparations of formed elements. We documented the best methods for obtaining and producing urine samples, took photographs of the microscopic images, and consolidated our information into a booklet that can help facilities with formed element production. With this information each facility can then select and create formed elements that are needed for microscopic study, thus reducing the need to collect samples from outside healthcare facilities.

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### **Inhibitory Effects of Lactobacilli on Pathogenic Streptococcus pyogenes**

*Mark L. Westbroek, Crystal L. Davis,  
Lena S. Fawson (Travis Price)*

*Oral Presentation  
Clinical Laboratory Science*

Lactobacillus bacteria produce lactic acid as a byproduct of metabolism, reducing the pH of surrounding areas to an acidic level in which few other organisms thrive. Nonpathogenic Lactobacillus species normally inhabit the vagina, thus, minimizing the opportunity for infection. This has led to an abundance of research in which various Lactobacillus species have proven effective in inhibiting the growth of many bacterial and fungal pathogens including Candida albicans, Escherichia coli, and Neisseria gonorrhoeae. Streptococcus pyogenes has not been considered a vaginal pathogen until the last several years; therefore, its interactions with Lactobacillus bacteria have not been studied. The aim of this research project is to determine whether a decreased concentration of Lactobacillus bacteria allows S. pyogenes bacterial vaginosis, or whether S. pyogenes is virulent enough to cause vaginosis even in the presence of healthy Lactobacillus concentrations. Understanding the interactions between Lactobacillus and S. pyogenes could lead to a greater knowledge of how to prevent such infections, exploration of probiotic therapy, and the ability to educate medical personnel and patients alike in appropriate responses to infections of this nature.

### **Optimus Primers**

*Austin Toupin, Brian Baird, Troy Flint  
(Scott Wright)*

*Oral Presentation  
Clinical Laboratory Science*

Students in the Advanced Clinical Microbiology laboratory in the CLS Department perform Polymerase Chain Reaction (PCR) tests using their own DNA. When they do this they see the variations and similarities found in the human genome. In order to perform a DNA fingerprinting test, there are several things that need to be done. The DNA is first denatured then, using primers, specific sections are amplified through replication. The resulting PCR products are separated through electrophoresis to produce a DNA fingerprint. The objective of our study is to optimize DNA fingerprinting procedures that are similar to those used by the FBI. This is accomplished by systematically testing and altering variables that are causing poor results. We are performing many tests with varying concentrations of MgCl and primers to optimize the quality of the DNA fingerprints. DNA yield from epithelial cells collected through swabbing the buccal cavity was compared to the DNA yield collected using a mouthwash.

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# Abstracts

## Depegylation of Red Blood Cells in Clinical Situations Consistent with Transfusion

*Zachary Robinett, Eric Okelberry, Krystle Cordingley, Alex Drake, Scott Moore  
(Kara Hasen-Suchy)*

*Oral Presentation*

*Clinical Laboratory Science*

Recent attempts have been made to create the use of universal red blood cells (RBCs), which would have tremendous positive implications in transfusion medicine. By covalently binding long polymer chains of polyethylene glycol (PEG) to the erythrocyte membrane, prior researchers have created PEGylated red blood cells (PEG-RBC), which effectively repel the attack of antibodies on RBC surface membrane antigens. The purpose of this study is to verify the durability of the PEG-RBC complex in the conditions that commonly accompany blood transfusion. This is important because any degree of dePEGylation could seriously harm the recipient as donor RBCs would be left unprotected and hemolytic transfusion reaction would occur. Major transfusion recipients consistently experience the following conditions: acidosis, bacteremia, and exposure to radiation. We have designed methods simulating these conditions and have monitored the effects of the various simulations using anti-D surface antigen to detect exposure of the antigen, a stain to detect the viability of the cell, and a scoring system to quantify any dePEGylation that occurred as a result. By simulating the conditions seen during blood transfusions in vitro with controlled processes, we have evaluated and compared the durability of the PEG-RBC complex in modified RBCs created by two different methods.

## Decreasing Stat Turnaround Times With Stat Monitor Screen

*Christy James Achter, Randee Hess, John Hansen  
(Leonard G. Nielsen)*

*Oral Presentation*

*Clinical Laboratory Science*

Decreasing STAT turnaround times in hospital laboratories is critical to patient care. McKay-Dee Hospital Laboratory has adapted a STAT monitor screen that displays every STAT test received in the lab that has not been resulted in the computer. The screen is currently mounted in the Chemistry department; however, every technician can open the STAT screen on any terminal in the lab. All tests are color-coded based on how long each test has been pending in the lab. Once the test has been completed and reported out, it is automatically removed from the monitor screen. To determine if the monitor screen has decreased STAT turnaround times we will be using data from 3 months prior to the screen, opposed to 3 months following the implementation of the screen. The tests we will be specifically monitoring are: CBC, PT, PTT, BMP, CMP, TCA, UA, Serum/Urine HCG, Fecal WBCs and CSF cell count/diff. We will be using the time stamp from when the sample was accessioned in the lab to the time the result is verified or entered into the computer. Using the 10 tests mentioned before, we will also break down these results based on shift and department.

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## Parental Dental IQ

*Chelsea Buckwalter, Lindy Gale, Nicole Lewis  
(Kami Hanson, Stephanie Bossenberger)*

*Oral Presentation  
Dental Hygiene*

“Dental caries remains the single most common disease of childhood that is not self-limiting or tractable with antibiotics.” There are many children around the world that unfortunately are affected by this disease. Dental caries can cause severe pain, abscesses and decreased immune systems; therefore affecting mental social and physical aspects of their lives. “Early childhood caries (ECC) is a serious public health problem in both developing and industrialized countries...Untreated ECC can lead to harsh consequences such as abscesses, pain, malocclusions and lasting psychosocial impediments.”

We are presenting data we have collected on how much parents know about their Child's oral health. We studied if parents do have knowledge of their child's oral needs, are they accurately applying it to their child's oral care? These are the four ways we addressed the knowledge of the parents: 1) Are parents aware of the oral hygiene needs of their child? 2) Do the parents value the care of deciduous teeth? 3) Do parents know that dental caries can affect mental, physical, and social aspects of their child's life? 4) Are there education materials available to the parents so they know what the problems are, and how to solve childhood caries?

## HPV and Oral Cancer: What Dental Professionals Need to Know

*Julie Christiansen, Denae Lemich  
(Kami Hanson)*

*Oral Presentation  
Dental Hygiene*

Current research shows that the HPV vaccine, Gardasil, is effective against 4 strains of HPV, 6, 11, 16, and 18. Two of these strains (16 & 18) are considered high risk factors for Oral & Oropharyngeal Squamous Cell Carcinoma (OOSCC). Approximately 1/3 of OOSCC cases can be attributed to high risk HPV infection (16 & 18). Studies are currently being performed to provide evidence that widespread vaccination for the HPV virus has a great potential for reducing the number of OOSCC cases each year.

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# Abstracts

## **Eating Disorders: A Study of High School Students' Awareness**

*Becky Jackson, Janet Johnson, Camille Shumway  
(Kami Hanson)*

*Oral Presentation  
Dental Hygiene*

While the general population acknowledges anorexia and bulimia as eating disorders, there are many other ways in which an eating disorder can be manifest. Not only are eating disorders detrimental to overall health, but there is a relationship between eating disorders and oral health. The harmful habits and nutritional deficiencies that often accompany disordered eating can have severe consequences on oral health. It is important to be aware of the types of eating disorders, risk factors, systemic effects, oral manifestations, and treatment considerations.

We conducted a survey to research the awareness of high school students in Weber County regarding the types and the oral affects of eating disorders. We hypothesized that the majority of the population would recognize the adverse oral effects of bulimia, but fail to realize that other eating disorders are related to oral health. We also hypothesized that the majority of the population would not be aware that there are so many different types of eating disorders. The results of the survey showed that only twenty-six percent of the sample population was aware that anorexia has harmful effects on oral health.

Seventy-three percent had not heard of more than three types of eating disorders.

## **Excessive Use of Dental Barriers**

*Claire Allred, Emilie Egan, Chelsie Baumgartner  
(Kami Hanson)*

*Oral Presentation  
Dental Hygiene*

The issue of disposable plastic barriers is important to investigate because of clinical research that undermines the merit of its use and because dental professionals should be more environmentally conscious. The principle of Community found in the Code of Ethics is based on the responsibility to preserve natural resources and protect the environment as much as reasonably possible. There should be a reduction in the amount of plastics used in dental operatories should be reduced to only that which is necessary. The purpose of our research is to investigate the usage of plastic surface barriers in general dental offices. The guiding research questions are: 1) what percentage of general dental offices across the United States use plastic surface barriers? 2) what surfaces in a dental operatorie are covered by barriers, 3) how much waste is produced each day? Our research is geared toward the current use of disposable plastic barriers in private dental offices. We will be conducting a survey consisting of 4 questions to 2 dental offices in each of the 50 states. Data for this research is pending currently, but will be completed at time of presentation.

*Weber State University*  
*Sixth Annual Undergraduate Research Symposium*

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*College of Science*

*Abstracts - College of Science*



*Scientific research consists in seeing what everyone else has seen,  
but thinking what no one else has thought.*  
*-Unknown*

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## Abstracts

### **Germination of *Cypripedium parviflorum* (orchidaceae) Seeds Using Crude Soil Inoculum**

*Meghan McCormick (Ron Deckert)*

*Oral Presentation*  
*Botany*

*Cypripedium parviflorum* is a species of temperate terrestrial orchid having a widespread distribution in the United States; however, it is listed by the USDA Forest Service Rocky Mountain Region as a sensitive plant species. *C. parviflorum* seeds lack nutrient reserves and require fungal symbionts to germinate. The effect of soil on *C. parviflorum* germination rates from 10 sites was studied. I tested the hypothesis that germination rates of *C. parviflorum* will respond to the presence or absence of particular fungal symbiont species in the different soils. Sites ranged in quality from known orchid sites to orchid hostile habitats. Seeds were exposed to crude soil inoculum using one of three germination techniques: 1) Petri plates containing cellulose agar, 2) Petri plates containing a simplified soil microcosm, and 3) ex-situ seed baits in pots with soil collected from test sites. Asymbiotic germination of seeds on nutrient agar was used as a control. The asymbiotic germination percentages were low (<5%). The simplified soil microcosms exhibited higher seed vitality rates with treatment of soil from known orchid sites, suggesting that germination rates will be correspondingly higher in those sites. Soils from sites that co-relate with high seed vitality may indicate potential *C. parviflorum* habitats.

### **The Migration of Plants and Culture: The Presence of Traditional Mexican and Central American Medicinal Plants in the Latin Markets of Ogden, Utah**

*Cheyenne Church-Herland*  
*(Susan Young)*

*Oral Presentation*  
*Botany*

Plants sustain every ecosystem and culture. Plants, people, and information are all migratory and knowledge of indigenous plant use resides within the minds of individuals; as individuals move, so too do their culturally important plants. An increasing Latin population in Ogden, Utah prompted an investigation of the connection between traditional plant uses and immigration. Eighteen local markets were surveyed for the presence of seven sample plants. Demographic research verified a growing Latin population. Interviews with Mexican immigrants, including two traditional healers, illustrated a changing Latin world-view. As culture undergoes rapid change, the plants necessary for strong cultural maintenance are represented most consistently in the continuance of traditional cuisine. Plants not used in foods and medicines or other daily customs fall out of use.

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**Analysis of Titanium Oxide in Liquid Paint by X-ray Fluorescence Spectroscopy**

*Rachelle Maass, Hyun Ah Choi  
(Ed Walker)*

*Poster Presentation  
Chemistry*

Titanium oxide pigments are incorporated into paint to enhance color, opacity, and durability. Titanium oxide accounts for about one-third of all pigments used in paints, often formulated into liquid paint emulsions at relatively high concentrations. An important aspect of quality testing is the determination of titanium oxide in liquid paint emulsions. Traditional methods of analysis require extensive sample preparation, such as ashing and subsequent dissolution, prior to atomic absorption or emission spectroscopy. In an effort to provide a more rapid and simplified test procedure, X-ray fluorescence was successfully applied to whole liquid paint samples. A method was developed using a mobile, hand-held x-ray fluorescence instrument that accurately determined total titanium levels in just 30 seconds. The method exhibits linear correlation across a range of 0-10%(w/w) TiO<sub>2</sub>. Higher concentrations deviated somewhat from linearity, but were readily measured based upon a second-degree polynomial calibration curve.

**Rapid Analysis of Tin in Zirconium Alloys by X-ray Fluorescence**

*Spencer Barrett, Rachelle Maass  
(Ed Walker)*

*Poster Presentation  
Chemistry*

Zirconium is an important metal used in the nuclear fuels industry. Adherence to rigid specifications for Zr alloys, called Zircaloy, is critical to ensure its performance and efficiency in the extreme environment of nuclear reactor cores. Tin is present in Zircaloy at low concentrations, typically 1.5% (w/w). The most common method for determination of Sn is ICP spectroscopy. We report the application of XRF for analysis of Sn in both solid metal samples and aqueous solutions of Zircaloy. By virtue of the different emission energies of Zr and Sn, this analytical method does not suffer from commonly encountered difficulties caused by high Zr levels during ICP analysis.

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# Abstracts

## Rapid Determination of Gold During Plating Operations by X-ray Fluorescence

*Brandon Burnett, Andrew Giles  
(Ed Walker)*

*Poster Presentation  
Chemistry*

The process of electro-plating gold onto conductive surfaces electrochemically deposits a very thin layer of metallic gold over the surface of the item to be plated. This process can impart some of the desired properties of the gold to the entire piece being plated at a fraction of the cost of solid gold. In many cases, the important mechanical properties of the substrate can be maintained to obtain the desirable benefit of an exposed gold surface. The concentrations of gold and various additives in cobalt-hardened plating solutions affect the cathode efficiency. The purpose of this study is to determine the influence of gold concentration on the cathode efficiency of the plating cell in the presence of typical additives. A mobile hand-held X-ray Fluorescence (XRF) instrument was utilized to successfully analyze gold in plating solutions at concentration ranges of 0-12 g/L in the presence of several additive ions including: Co, Ni, K, Mn and Cr. XRF was also utilized to determine the thickness of gold layers plated on copper substrate up to 10 microns. The cathodic efficiency of the plating process was then studied using this method, revealing that an optimum gold concentration of 7.4 g/L under our experimental conditions.

## Phosphate Removal

*Ty Flint  
(Tim Herzog)*

*Poster Presentation  
Chemistry*

With EPA regulations soon to be imposed for wastewater treatment plants to regulate phosphate levels in effluent wastewater, phosphate removal methods are needed. Using an electrolysis reaction, the abilities of aluminum and iron electrodes to remove phosphates was investigated. Our goal was threefold: 1) to calculate phosphate concentrations in water samples, 2) to reduce phosphate levels in those water samples, and 3) to analyze how much phosphate has been removed. Two aliquots of a particular water sample were placed in two separate beakers. Two aluminum electrodes were placed in one beaker and two iron electrodes were placed in another. Using a variable transformer, a 30 V potential was applied to the electrodes for 30 minutes. Gas evolution at, and solid deposits on, the electrodes was observed. Using a visual indicator (an Ascorbic acid, Ammonium Molybdate, Antimony Potassium Tartate, Sulfuric acid solution mix) the amount of phosphate left in solution was calculated using a spectrophotometer measuring absorbance at 880nm wavelength. The phosphate concentrations before electrolysis were measured as well. The process was a typical visible spectroscopy method employing linear regression and standards made of distilled water and potassium phosphate. It was observed that both types of electrodes removed phosphates. It was also generally noted that Aluminum electrodes removed more phosphates than Iron electrodes.

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**Observations of Weathering and  
Microbiological Alterations on the Surface  
of Calcite Buried in Arctic Soil**

*Sara Summers*

*(Marek Matyjasik, Colin E Inglefield)*

*Poster Presentation*

*Geosciences*

This study focused on the direct observation of chemical weathering and biological activity on mineral surfaces in the newly forming arctic soil of West Spitsbergen. Chemical weathering and soil forming processes associated with glaciers may affect several geochemical cycles, including global carbon cycle, and as a result, have negative feedbacks on the global climate. Study areas are the forelands of the Werenskiold glacier, continuously retreating by several meters a year. Several samples of freshly cleaved calcite had been buried in the soils for one year. Samples were analyzed with the use of Atomic Force Microscopy (AFM). Results of AFM investigation show changes observed on a calcite sample located respectively about 2500 meters (sample calcite 1) and 100 m (sample calcite 2) from the glacier front as compared to a control sample calcite 0 that has never been exposed to glacier environment. Samples calcite 1 and calcite 2 were recovered from Spitsbergen after 1 year.

Compared to the control sample calcite 0, which displays sharp edges and smooth surfaces, both field-treated samples calcite 1 and calcite 2 display rounded edges, irregular surfaces, numerous dissolution features, and rounded pitches associated with bacterial activities. The observations suggest that both samples calcite 1 and 2 undergo intensive and rapid chemical and biological weathering when exposed to relatively unsaturated with respect to calcite glacial meltwaters. Several types of analyses have been applied to various regions and lines on the calcite surface.

Selected regions on the calcite surface included: (a) the entire area of the observed surface, (b) top step region roughness, and (c) bottom step region roughness. Selected line parameters have been calculated along: (a) three randomly selected parallel lines, (b) top step line roughness, and (c) bottom step line roughness. Both surface area roughness and line roughness are calculated as the mean deviation of the height. Significant differences have been observed between the same.

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# Abstracts

## **Constructing a Baseline Model of Alpine Wetlands of the Uinta Mountains**

*Sonya B. Welsh, Kevin S. Severson,  
Lee M. Bartholomew (Marek Matyjasik,  
Rick Ford, and Michael Hernandez)*  
*Poster Presentation  
Geosciences*

Alpine wetlands of the Uinta Mountains contain a variety of groundwater-dependent ecosystems. Unlike their counterparts in other areas of the Rocky Mountains, these systems have been relatively unstudied. The primary goal of this study is to establish the functional links between the geomorphology, hydrogeology and the constituent plant communities. Geospatial technologies are being used to analyze both field data and archived multispectral imagery. The hydrology of these wetlands is dominated by groundwater discharge, and their surface is dominated by string-and-flark morphology, making these montane wetlands classic patterned fens. Major plant communities have been identified within the wetlands, as well as within hummocky transition zones between wetland and non-wetland areas. Analyses of water-chemistry data will be used to identify discrete water sources and to characterize the degree of water mixing within the system, as well as to help identify the biochemical requirements of the different plant communities. Results indicate that the chemical composition of the main creek reflects the cumulative effect that the peaty flarks have on the creek as it passes through the wetland system, with pH decreasing downstream (7.3-7.0). String groundwater is characterized by relatively high pH (6.0-7.1); while flark ground water has relatively lower pH (5.6-6.8).

## **Survival of Escherichia coli in bruised apples and Salmonella Enteritidis in tomatoes**

*Casey Johnston, Brian Bentley, Tyson Steel,  
Ryan Adams, Nate Brooks (Karen Nakaoka)*  
*Oral Presentation  
Microbiology*

Recent outbreaks of bacterial infections occurred after consumption of uncooked fruits or vegetables. While washing should prevent most of these infections, some outbreaks occurred because the uncooked foods contained internalized pathogens. To understand more about pathogen survival inside fruit, E.coli was inoculated into bruises of apples. Apples were incubated up to 15 days at room temperature or in the refrigerator. The bacteria in the bruises of refrigerated apples survived a few days, then decreased, while those in bruises of room temperature apples multiplied slightly. Fortunately, bacteria remained only in the bruise. Likewise, tomatoes were immersed in an aqueous solution of Salmonella Enteritidis for 1 minute or 1 hour, mimicking irrigation using non-potable water. The tomatoes were air dried and incubated up to two weeks at room temperature or refrigerated. The outer skin was removed and inner portions of the stem and bottom end of the tomatoes were screened for Salmonella, Results indicated that Salmonella entered into the tomatoes, but their numbers declined over time. Counts were lower in the refrigerated tomatoes. Results of both experiments indicate that since these pathogens can survive inside of apples and tomatoes, appropriate measures should be taken to prevent this.

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**Antibiotic Susceptibility in Halophiles Found in the Great Salt Lake**

*Brandon Cassel  
(Craig Oberg)*

*Poster Presentation  
Microbiology*

Halophile isolates from the Great Salt Lake (GSL) were analyzed for their susceptibility to common antibiotics. Twenty halophilic strains were tested against tetracycline, ampicillin, vancomycin, doxycycline, sulphamethazole/trimethoprim, and oxacillin. Results show only ampicillin and sulphamethazole/trimethoprim inhibited all 20 halophile strains. *Salinivibrio costicola* (S22), *Idiomarina* sp. (S3), *Salinococcus* sp. D23.3 (S29), and *Halomonas* sp. LCKS0 (S26, S34) were also susceptible to oxacillin. Only *Salinivibrio costicola* SV2 showed a susceptibility to tetracycline. Halophile strains generally appear to be susceptible to antibiotics that deal with transcriptional activity and seem resistant to antibiotics that inhibit peptidoglycan synthesis. The halophile isolates were resistant to most antibiotics, which could be transferred from enteric bacteria that also inhabit the south arm of the GSL. This could be an indication that antibiotic resistance from bacteria, whose source is local sewage plants and migratory bird populations, can be found in halophiles that also inhabit the GSL, suggesting lateral gene transfer may be occurring in this environment.

**Method Development to Study Lysogenization in Halophiles Isolated From the Great Salt Lake**

*Karli Oberg, Christie Jensen, Adam Hutchinson,  
Trever Gray (Craig Oberg)*

*Poster Presentation  
Microbiology*

Limited research has been performed on lysogenization in halophilic bacteria found in moderately halophilic environments. Thirteen halophile bacteria strains were isolated from the south arm of the Great Salt Lake. Broth cultures of these isolates were exposed to either UV radiation at various time intervals or to mitomycin C to induce prophage induction. Growth conditions included various NaCl concentrations, nutrient levels, and incubation temperatures. A comparison between untreated control tubes and UV treated tubes showed much slower growth in treated tubes over time, indicative of prophage induction. Some of the treated culture tubes showed the characteristic drop in OD600 indicative of prophage induction. Of note, many of the halophilic strains were very sensitive to UV treatment surprising since these isolates are exposed to UV light in their environment. Spot tests with a soft agar overlay using filtrates from treated cultures have proved inconclusive. Results suggest the existence of prophage in some halophile isolates. Continued method development to induce prophage induction will include: varying the concentration of mitomycin C treatments, and utilizing variations in UV exposure intensity.

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## Abstracts

### **Evaluation of Soil Microbiota and Soil Chemistry in Competitive Success of *Halogeton glomeratus***

*Benjamin Lewis, Kelly Thomasson  
(Barbara Wachocki, Mohammad Sondossi)*

*Poster Presentation  
Microbiology*

*Halogeton glomeratus* is a highly invasive plant species toxic to livestock and is a great concern in the arid rangelands of the Western US. To better understand the invasion of *H. glomeratus* into native plant communities an investigation of soil microflora was carried out. Soil samples were collected at the Desert Experimental Range (DER), Utah, in mid June and mid August. Samples from areas dominated by *H. glomeratus* (HZ), areas dominated by the native species, winterfat (WZ) and between the two, ecotone (EZ), were plated on triptic toy agar, Sabouraud dextrose agar and Actinomyces agar. This culture dependant method did not reveal an overall difference in microbial counts among zones. However, on Sabouraud dextrose agar, higher levels of Penicillium-like molds were found in June HZ samples when compared to other zones. This difference was not seen in August samples. This may be important since seed germination occurs earlier in the year. Recently it has been suggested that the mechanism of *H. glomeratus* invasiveness is due to changes in soil chemistry and ecology. This suggestion was based on soil analysis and microbial functional diversity based on carbon source utilization richness. Our findings do not clearly support notable differences in microbial population diversity.

### **Calcium oxalate crystals in leaves of *Halogeton glomeratus***

*Benjamin Lewis  
(Barbara Wachocki, Mohammad Sondossi)*

*Poster Presentation  
Microbiology*

In plants, calcium oxalate deposition is common. Oxalate-producing plants, which include many crop plants, accumulate oxalate in the range of 3-80% (w/w) of their dry weight. Oxalic acid is believed to promote mineral weathering and formation. Oxalic acid also increases the mobilization of poorly-soluble nutrients and toxic heavy metals in the soil and consequently influences their bioavailability. Dry leaves of *Halogeton glomeratus* contain 172 to 346 g kg<sup>-1</sup> of soluble oxalic acid, with the total concentration of oxalic acid being 218 to 387 g kg<sup>-1</sup> (Williams, 1960). The possible functions of oxalic acid in plants are: plant protection against herbivores, insects, and microbial pathogens; pH regulation and osmoregulation; and precipitation of excess cations including toxic heavy metals. A Quanta 600, Environmental Scanning Electron Microscope, Phillips FEI, was used to examine the presence and crystal morphology of calcium oxalate in the leaves of *H. glomeratus*. Extensive presence of druse crystals was recorded. Elemental analysis of these crystals confirms their chemical composition, calcium oxalate, with some minor presence of magnesium and aluminum oxalates. Presence of and annual deposition of such large quantities of oxalic acid and its salts to the soil may play a role in invasiveness of this poisonous plant.

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**Mycorrhizal Associations in  
*Halogeton glomeratus***

*Benjamin Lewis, Kelly Thomasson  
(Barbara Wachocki, Mohammad Sondossi)*

*Poster Presentation  
Microbiology*

Most published studies note an absence of mycorrhizal associations with roots of *Halogeton glomeratus*, a highly successful invasive exotic plant species introduced to the Western US over 80 years ago. However, our initial preparations of root samples, taken from the Desert Experimental Range (DER) in Pine Valley, Utah yielded observations of a possible mycorrhizal interaction. Collection of intact root samples and associated hyphae proved to be a difficult task. To ensure collection of intact mycorrhizal/root samples an in situ root sampling technique was developed. This involved delicate washing away of the *H. glomeratus* rhizosphere to a depth of 50 cm and the transportation from the DER to WSU of samples frozen on dry ice. This procedure revealed the presence of an extensive delicate and external network of fungal hyphae associated with *H. glomeratus*. Standard preparative procedures for microscopic observation of ectomycorrhizal and endomycorrhizal associations were carried out. Specific staining of the fungal hyphae clearly showed the presence of mycorrhizae associated with the roots of *H. glomeratus*. To our knowledge this is the first report on this subject related to *H. glomeratus*.

**Preliminary metagenomic survey of bacteria  
associated with Great Salt Lake brine flies**

*Christy Cottrell  
(Jonathan Clark, Mohammed Sondossi)*

*Poster Presentation  
Microbiology*

Brine flies are important components of the Great Salt Lake ecosystem, removing organic matter and serving as a food source for millions of birds. In spite of their biological and economic importance, little is known regarding the adaptation of brine flies to the extreme conditions associated with the Great Salt Lake. It is possible that bacteria may play a role in allowing brine flies to thrive in this high-saline environment. Metagenomics involves the study of DNA isolated directly from environmental samples. This permits identification of organisms regardless of whether they can be cultured in the laboratory. In this study, a metagenomic analysis was used to identify prokaryotes associated with Great Salt Lake brine flies. Brine fly larvae were homogenized in a sterile solution and half of the homogenate used for DNA isolation, and half used to isolate microorganisms on agar plates. Among the isolates, a wide range of salt tolerance was observed. Following DNA isolation, a region of the 16S rRNA gene was amplified and its DNA sequence determined. By comparing the DNA sequences from the flies and from the cultures, it will be possible to evaluate the data obtained with culture-dependent techniques to those of culture-independent techniques.

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## Abstracts

### **Bacteriophage Inhibits *Erwinia carotovora*, a Well-known Bacteria that Causes Potato Spoilage**

*Adam Sessions, Corey Layton  
(Matthew J. Domek)*

*Poster Presentation  
Microbiology*

Potato spoilage due to bacterial contamination causes major economic loss in the potato industry. *Erwinia carotovora* (*E. carotovora*), is commonly found in soil and is associated with potato spoilage. In this study, we sought to identify bacteriophages that would inhibit *E. carotovora* and prevent potato spoilage. Soil samples were collected from surrounding potato farms. Extracts of the soil samples, which potentially contain inhibitory phages, were treated with chloroform to kill bacteria. The extracts were then pooled together in groups of five and tested against ten different strains of *E. carotovora*. A plaque assay in soft agar was used to determine the susceptibility of *E. carotovora* to the bacteriophage. Three different isolates of *E. carotovora* showed inhibitory plaque formation by bacteriophages present in the soil extracts. These bacteriophages will be used to test if a potato slice can be protected from spoilage by *E. carotovora*. Successful protection against spoilage has implications for decreasing spoilage of stored potatoes.

### **Biodegradation and Biodeterioration of Hydrocarbon-Based Fuels by Enriched Microbial Consortia**

*Alexander Villeda  
(Mohammad Sondossi)*

*Poster Presentation  
Microbiology*

Biodegradation of selected hydrocarbon fuels by enriched cultures obtained from contaminated and uncontaminated soils was investigated. Enriched cultures were obtained using a variety of paraffinic (PH) and aromatic hydrocarbons (AH). Using the microbial consortia from enriched cultures, biodegradation of 10 different hydrocarbon-based fluids and fuels were evaluated. Actively growing consortia were obtained in minimal media (MM) using hydrocarbons as the sole carbon and energy source. Microbial growth kinetics were tracked on selected hydrocarbon fuels (Bio-diesel, diesel, kerosene, and unleaded gasoline) inoculated with microbial consortia developed using AH and PH. Biosurfactants produced by consortia during growth on hydrocarbons were isolated using acid precipitation. Biosurfactants are surface-active compounds produced by microorganisms that have many applications. We concluded that both soil samples contained microflora with the capacity to utilize PH and AH. Unleaded gasoline did not support the growth of microbial consortia; therefore, it was not a preferred carbon and energy source. However, it did not have an apparent toxicity on microbial inocula in MM. Microbial growth kinetics indicated rapid growth of enriched cultures on selected fuels. All fuels tested were susceptible to contamination, biodegradation, and biodeterioration under conditions favoring microbial growth.

### **A Role for Microfibril-Associated Glycoprotein-2 in Wound Repair**

*Christian Francom  
(Barbara Crippes Trask, Thomas Broekelmann,  
Russel Knutsen, Robert P. Mecham)  
Oral Presentation  
Zoology*

The principal components of 12nm microfibrils are members of the fibrillin family, although other proteins, including microfibril-associated glycoproteins-1 and -2 (MAGP-1 and -2), may contribute to the function of these structures. Both fibrillin and MAGP-1 have been shown to interact with members of the TGF- $\beta$  family of growth factors and modulate their activity in vitro and in vivo. To investigate whether MAGP-2 might also interact with growth factors, the binding properties of recombinant MAGP-2 were studied using surface plasmon resonance. Solid-phase binding assays were also performed to identify insoluble binding partners. These studies revealed novel interactions including an MAGP-2 self-association and an interaction with the active forms of TGF- $\beta$  family members. The association between MAGP-2 and TGF- $\beta$ 1 is of particular interest given the biological importance of binding between the latent form of this growth factor and fibrillin. Because a delay in wound closure has been observed in MAGP-1 deficient mice, cutaneous wound-healing assays were performed in MAGP-1/MAGP-2 null (DKO) mice and wound closure rates relative to WT and MAGP-1 knockout animals were compared. Although no obvious abnormalities were evident in histological sections of skin from either of the MAGP-null animals, a significant lag in the initial rate of wound closure was observed in both groups of transgenic mice. MAGP DKO animals displayed a greater initial delay followed by quicker overall wound closure when compared to MAGP-1 null and WT animals. These studies suggest a biological role for MAGP-2 different from that of MAGP-1 in wound repair.

### **Ecomorphological Relations Between Cottus Species and Their Environment in Northeastern Utah**

*Nathan V. Holmes  
(Christopher W. Hoagstrom)  
Oral Presentation  
Zoology*

We compared body shapes of sculpin from 12 streams of northeastern Utah. We took 23 body shape measurements on sculpin over 71 mm in length, measuring a total of 373 individuals of 2 species (Mottled sculpin, Paiute sculpin). Head shape, body girth, mouth size, fin length, and prickle abundance were variable among specimens. Sculpin with longer heads, thicker bodies, larger mouths, and more prickles inhabited slower streams that had a greater abundance of brown trout and mottled sculpin as well as a greater number of fish species. Sculpin with narrower heads and shorter fins inhabited smaller streams with faster currents, deeper pools and a rockier streambed. These streams also had a greater abundance of brown trout and lesser abundance of mottled and Paiute sculpin. From this, it appears that competition and predation pressures combine with adaptations to local environmental conditions to influence sculpin morphology.

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# Abstracts

## The Efficacy of Dietary Fiber and Prebiotics on Intestinal Recovery

Todd Gilbert  
(Brian Chung)

Oral Presentation  
Zoology

A premature infant is usually born with serious complications and an array of barriers that impede stable health and normal development. One of the more serious complications that premature infants face is an undeveloped and non-functioning intestinal tract. Over-feeding of premature infants can lead to rapid death of the intestinal tract, often requiring surgical intervention. This further complicates the infant's development because the loss of intestinal tissue usually requires that a portion of the infant's nutrition be delivered intravenously (I.V.). While effective, I.V. nutrition bypasses the intestinal tract and has the side effect of further hindering intestinal development. Additional complications of I.V. nutrition include liver damage and increased risk of kidney stone formation. Our hypothesis holds that the inclusion of either fiber and/or prebiotic bacteria will promote the development of an immature intestinal tract and alleviate damage induced by I.V. nutrition. Newborn piglets were subjected to resection of 80% of their small intestinal length, placed on I.V. nutrition and randomized to receive either: normal infant formula, formula augmented with dietary fiber, formula with a prebiotic (*Lactobacillus GG*), or a combination of fiber and prebiotic for up to 7 days post-op. Liver and kidney samples that were obtained were obtained for analysis of histological signs of damage. This analysis is ongoing and we are in the midst of analyzing our liver specimens for telltale signs of hepatic damage induced by I.V. nutrition. The analysis of these tissues will pave the way for improved treatments in the future.

## The Comparison of Intestinal Amino Acid and Peptide Transport on Growth and Development

Jacob C. Wood  
(Brian Chung)

Oral Presentation  
Zoology

Proteins are the center of every living organism. In order to sustain life, organisms must obtain the components to build these necessary proteins via dietary consumption. Dietary proteins are first digested into amino acids and small peptides before being transported into the body through specific amino acid and peptide transporting proteins in the intestinal tract. The circulatory system distributes these amino acids and peptides to the cells throughout the body so that they can reassemble these products into their own proteins.

Our hypothesis is that the uptake of dietary peptides is more important than amino acid uptake on overall physiology. Our initial experiments seek to determine the growth rates of the nematode *Caenorhabditis elegans* in three growth conditions: control (agar plates seeded with *E. coli*), a liquid medium seeded with *E. coli*, and a chemically defined liquid medium containing only amino acids. Preliminary data indicates decreased growth rate in both liquid mediums when in compared controls. In future experiments, we will genetically hinder the expression of these peptide or amino acid transporters to determine the importance of these transporters on growth. Clinical applications of our data include improving the ingredients of infant formula in order to positively influence growth.

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**Effect of Selenium on the Brine Shrimp  
Artemia**

*Jeff Jepperson (Nicole Okazaki)*

*Poster Presentation  
Zoology*

The Great Salt Lake ecosystem supports a large migratory bird population and a brine shrimp cyst industry that are endangered by rising levels of selenium (Se). Se is released from various industries around the lake, including mining. This study attempts to quantify the acute and chronic effects of Se exposure on various brine shrimp *Artemia*. After 24-hour exposure, larval mortality increased from 35 to 98% at 0.1 and 1 mg/L Se concentrations, respectively. Adult mortality rate jumped from 9 to 98% at the above concentrations. Under chronic exposure (1 and 10 µg/L Se), the maturation time and number of eggs per brood were not significantly different from the control; however, a large number of broods might have had on-viable embryos. Tests for changes in superoxide dismutase, reduced glutathione, and lipid peroxide did not show any significant differences due to 24-hour exposure to Se concentrations ranging from 0.1 µg to 1 mg/L. A general protein profile after SDS-PAGE suggested that some proteins are up-regulated while others are down-regulated. Heat shock protein 70 was not up-regulated by Se exposure. Selenium appears to decrease egg hatchability and affect both larval and adult shrimp survival rate.

**Phylogenetic Analysis Of The Telomere-  
Associated Gene (HeT-A) In Drosophila**

*Natasha Neilsen (Jonathan Clark)*

*Poster Presentation  
Zoology*

The ends of eukaryotic chromosomes may shorten during replication and must somehow be regenerated to maintain vital cellular functions. Telomeres are regions of repetitive DNA at the ends of chromosomes that serve to protect the chromosomes from degradation. In most organisms, the enzyme telomerase adds specific DNA sequences to replenish the lost DNA. In contrast, the telomeres in the model genetic organism, *Drosophila*, are formed by a transposable element known as HeT-A. Transposable elements are DNA sequences that are capable of mobility in the genome. By examining HeT-A DNA sequences isolated from different species of *Drosophila*, it is possible to determine their evolutionary history. It is expected that the HeT-A genes from closely related species would be similar in their DNA sequences. With this information, we wanted to examine the evolutionary history of the HeT-A gene using phylogenetic analysis. We extracted DNA from nine different species of *Drosophila* and HeT-A specific primers were used to exponentially amplify this region of DNA using polymerase chain reaction (PCR). Analysis of the relationships of HeT-A sequences among the nine species allowed us to generate a cladogram or evolutionary tree. In general, the phylogeny of HeT-A parallels the phylogeny of the different species from which the sequences were obtained, consistent with its important cellular function.

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# Abstracts

## **Sexual Dimorphism of Syringeal Muscles in Songbirds**

*Jared Green, Amiko Uchida, Sarah Ahmad, Ron Meyers, Franz Goller  
(Ron Meyers)*

*Poster Presentation  
Zoology*

Male songbirds typically sing more frequently, and more complex songs, than females; in some species, females do not sing at all. This behavioral difference is paralleled by sexually dimorphic syringeal muscle mass, but whether it is also reflected in syringeal muscle architecture is unknown. Fiber type composition of these muscles was investigated using myosin ATPase and immunohistochemistry. Female and male members of 5 oscine species (European Starlings, *Sturnus vulgaris*; White-crowned Sparrows, *Zonotrichia leucophrys*; Red-winged Blackbirds, *Agelaius phoeniceus*; Brown-headed Cowbirds, *Molothrus ater*; and Bengalese Finches, *Lonchura domestica*) all showed similar syrinx muscle fiber morphology, with larger superfast fibers outnumbering smaller fast fibers (for starlings: superfast fiber mean diameter 31-38 $\mu$ m and ~70% of fiber population; fast fiber mean diameter 14-20 $\mu$ m and ~30% of fibers). In contrast, Zebra Finches (*Taeniopygia guttata*) showed pronounced sexual dimorphism, with males possessing a majority of superfast fibers (as in the other species examined) and females a majority of fast. This finding provides a structural explanation for equal twitch durations in male and female starlings and faster twitch times in male Zebra Finches relative to females.

Whereas female starlings, sparrows, and blackbirds sing occasionally, female Zebra Finches, cowbirds, and Bengalese Finches do not. Thus the presence of superfast fibers does not parallel the occurrence of singing in females. These findings suggest that superfast fibers may be a basal character of the oscine syrinx, or are essential for other vocal or non-vocal functions. Further investigation of closely related species and behavior is needed.

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**Dietary Analysis of Two Snake Species  
on Antelope Island**

*Lucas K. Hall (John Cavitt)*

*Poster Presentation  
Zoology*

Although the ecology of the Western Yellow-bellied Racer (*Coluber constrictor mormon*), and the Great Basin Gopher Snake (*Pituophis catenifer deserticola*), has been documented within the Great Basin, few studies have examined their feeding habits. This lack of basic natural history information is a major impediment to the conservation of these species, particularly in light of degradation of local island landscapes by exotic and invasive species. We collected data from June through September 2005 at Antelope Island State Park in Davis County Utah. Snakes were captured primarily using hardware cloth drift fences with funnel traps. However, dietary data was also collected from individuals captured by hand and from road-killed snakes. Dietary information was obtained from twelve racers and two gopher snakes. We found that stomach contents were similar to those previously reported for these species. Our data correlates with previous findings for racers in two ways: 1) they prefer orthopterans among insect prey and 2) larger females incorporate vertebrates into their diet. The results from this dietary analysis are comparable to other studies reported from the Great Basin. However, these results do provide the first published dietary records for reptiles inhabiting islands of the Great Salt Lake.

**Morphological Variation Among Humpback  
Whitefish in Interior Alaska**

*Michael Cranney (Christopher W. Hoagstrom)*

*Poster Presentation  
Zoology*

The ends of eukaryotic chromosomes may shorten during replication and must somehow be regenerated to maintain vital cellular functions. Telomeres are regions of repetitive DNA at the ends of chromosomes that serve to protect the chromosomes from degradation. In most organisms, the enzyme telomerase adds specific DNA sequences to replenish the lost DNA. In contrast, the telomeres in the model genetic organism, *Drosophila*, are formed by a transposable element known as HeT-A. Transposable elements are DNA sequences that are capable of mobility in the genome. By examining HeT-A DNA sequences isolated from different species of *Drosophila*, it is possible to determine their evolutionary history. It is expected that the HeT-A genes from closely related species would be similar in their DNA sequences. With this information, we wanted to examine the evolutionary history of the HeT-A gene using phylogenetic analysis. We extracted DNA from nine different species of *Drosophila* and HeT-A specific primers were used to exponentially amplify this region of DNA using polymerase chain reaction (PCR). Analysis of the relationships of HeT-A sequences among the nine species allowed us to generate a cladogram or evolutionary tree. In general, the phylogeny of HeT-A parallels the phylogeny of the different species from which the sequences were obtained, consistent with its important cellular function.



*Weber State University*  
*Sixth Annual Undergraduate Research Symposium*

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*College of Social & Behavioral Science*

*Abstracts - College of Social & Behavioral Science*



*Research serves to make building stones out of stumbling blocks.*  
*Arthur D. Little*

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# Abstracts

## **Uintah United - A Documentary Film**

*Issac Goeckeritz (Gene Sessions)*

*Performance Presentation  
Geography*

In 1922, a small Utah town was rocked with the news that Marlow J. Christensen, the local school principal, had shot and killed one of his students. The student was a member of a gang of boys who had been responsible for threatening and driving out eight prior principals. Shocked and deeply divided by the event, the community of Uintah broke apart. Uintah United tells the remarkable story of the principal's successor, Golden Kilburn, who masterfully transformed the lives and behavior of these troublesome boys and healed a community. Narrated by Dick Nourse.

## **Wildfire in the Wildland-Urban Interface: Comparison of Pixel- and Object-Based Classifications Using High-Resolution Aerial Photography to Construct Land-Use Land-Cover Maps**

*Gregory Fryer (Bryan Dorsey)*

*Poster Presentation  
Geography*

Urban development in the outlying transition zone of metropolitan and rural areas, regularly called the Wildland-Urban Interface (WUI), has brought a diverse range of challenges to forest managers as well as firefighting personnel. Wildfires that occur in these fire-prone areas are an increasing risk to life, property and natural resources. Forest and fire managers in Utah are in certain need for land-use land-cover maps to assist in their efforts. Research will focus on determining the best way to process imagery (pixel based or object based) to conduct classification of the wild land, urban interface and compile these maps. An overlay analysis of the maps will be conducted to pinpoint vegetation types, wildlife habitats, housing developments, and firefighter resource allocation, as well as roads for access and egress. Ultimately, I hope to provide a practical and inexpensive solution or helpful tool that can be implemented by forest and fire managers.

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**The Bikers at Angelo's Bar**

*Randy Bass (Kathryn MacKay)*

*Oral Presentation  
History*

My research includes Angelo's Bar on Twenty-fifth Street in Ogden as a "Third Place" that was "taken over" by Bikers in 1981. This "Third Place" has become a social focal point for local bikers to hang out, party, socialize, and has also become a staging point for rides; all of that defines what a "Third Place" represents. This research includes a brief definition of Biker culture, its history in Ogden, as well as the building occupied by Angelo's, interviews with some of its patrons, and local Biker Club members.

**Woods Cross Canning Company: Vital Davis  
County Industry**

*Janice LeFevre (Stan Layton)*

*Oral Presentation  
History*

The Woods Cross Canning Company was an important Davis County agribusiness from its organization in 1892 until it closed in the 1970s. The purpose of my research was to learn the cannery's history, how it functioned and the economic impact of this agribusiness on the Davis County community. I drew upon original source materials from various repositories and private collections. My research uncovered the cannery's ledger books and board meeting minutes that dated from as early as 1912. I also interviewed people who had managed, contracted with or worked for the cannery. I discovered that the cannery's three factories in Layton, Clearfield, and Woods Cross provided a stable and steady market for local farmers, infused much-needed currency into the local economy and also employed hundreds of people, primarily for seasonal labor. I was able to compile a detailed history of the cannery and how it operated. My research revealed that in its early decades, the cannery had significant impact on the county's economy—as much as 25-35%—and continued to be an important player until the 1950s. Due to time constraints, my presentation will focus on highlights of the cannery's history and contributions from 1892-1929.

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# Abstracts

## Women's Studies

*Holly Rawson (Kathryn MacKay)*

### *Oral Presentation History*

My Presentation at the Undergraduate Research Symposium will discuss why it took so long for the Women's studies program to be established at Weber State. When Dr. Gene Sessions attempted to bring the program to the University in 1979, he was met with opposition. The faculty of the time consisted of mostly males who did not see the need for such a program. Some of the few female faculty were pressured into not supporting the program by their male bosses. Without faculty support, Dr. Sessions proposal was rejected. In 1989 Dr. Kathryn Mackay was hired as the first female history professor. She brought with her the experience of having helped develop the Women's studies program at the University of Utah. Dr. Mackay worked with her colleagues for a year to develop a women's studies program. They met with other professors, seeking their support and discussing their concerns. Accepting women's studies as a program was important because of its rich scholarship, and having such a program was part of being a credible university. With much stronger support from the Female and Male Faculty the proposal passed and the women's studies program was established.

## The Junction City Big Band

*Adam Rosenberg (Dr. Kathryn MacKay)*

### *Performance Presentation History*

Documentary film about the Junction City Big Band that was organized at WSU in the 1980s. The Band has continued to be a popular local band presenting swing era music.

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**The Crossroads of the West: Intensive Level Survey and Documentation of Structures within Ogden's Historical Downtown District**

*Joseph Jay (Kathryn MacKay)*

*Poster Presentation  
History*

In 2000, the United States Congress passed an act that created the Crossroads of the West Historical District within downtown Ogden. The purpose behind the creation of that district was to create oversight and protection for the significant history claimed by the railroad industry, which the city of Ogden has been a major contributor to over the decades. The act from Congress charged local governments and nonprofit entities to develop and improve the historical infrastructure within the district. In order for local governments to extend that protection, historical verification and significance needs to be assessed before the property can be listed on either the Ogden City Register of Historical Resources or the National Register of Historic Places. My project was to select ten of these properties that needed proper documentation to determine the structure's historical significance by completing intensive level surveys as prescribed by the Department of the Interior for historical structure documentation.

**Democracy and Equality: An Examination of Nations in Respect to Women's Rights and Achievements in Society**

*Kjerstin Myers (Leah Murray)*

*Oral Presentation  
Political Science and Philosophy*

The purpose of this study was to understand the relationship between democracy, equality and women's rights in different regions of the world. The assertion that democratic nations generally have more equality and rights for women was tested. An analysis of women's rights in 10 nations revealed that democratic nations did not necessarily have a greater level of equality and women's rights than those that are non-democratic. Therefore, democracy did not play an influential role in increasing and improving women's rights as was previously suggested, rather a country's human development levels played a role. Greater human development within a country led to a higher degree of gender empowerment and a more inclusive form of women's rights.

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## Abstracts

### **Perceived Cultural VS. Moral Similarity: Effects On Out-group Prejudice**

*Shawn N. Thompson (Azenett Garza)*

*Oral Presentation  
Psychology*

This study investigates whether people who are asked to focus on how different their ethnic group is to an out-group on cultural values will result in decreased prejudice towards that ethnic out-group, and whether people who are asked to focus on how similar their religion is to a religious out-group will result in decreased prejudice towards that religious group. A total of 170 participants were asked to make one of four types of comparisons resulting in a 2 (Values Comparison: Cultural vs. Moral Values Comparison), X 2 (Type of Comparison: Similarity vs. Difference), between subjects ANOVA. Participants were then given a self-affirmation task followed by either an ethnic or religious out-group prejudice measure. Results show participants who were asked to focus on similarities on moral values between religions rated their group as more similar and exhibited more prejudice toward a religious out-group. Furthermore, it was found that those asked to focus on differences in cultural values to an ethnic out-group rated their group as more similar and responded with more prejudice towards an ethnic out-group than those asked to focus on similarities. These findings seem fitting with the theoretical models of intergroup interaction, but fall contrary to our predictions.

### **General Anxiety, Depression, Social Anxiety, and Social Support: Prevalence and Comorbidity among College Students**

*Jason R. Swift, Sarah R. Wheelwright  
(Theresa Kay)*

*Oral Presentation  
Psychology*

This study investigated the relationships between general anxiety, social anxiety, and depression as well as the role of social support among college students. Various self-report questionnaires that have been deemed valid and reliable were used to measure these four variables. Two samples of students were taken. The first sample consisted of students from National Depression Screening Day. The second sample was taken from two Psychology 1010 courses. We hypothesized that general anxiety, social anxiety, and depression would be positively correlated. This hypothesis was based on previous research as well as on a theory that if an individual has high social anxiety, he or she would more likely be depressed due to difficulty connecting with others. We also hypothesized that there would be a negative correlation between social support and the previously mentioned conditions which would suggest that support from family and friends may play a vital role in preventing or alleviating negative psychological conditions. Our first hypotheses was confirmed with a statistical significance at the  $P < .01$  level. The second hypothesis was significant at the  $(P < .05)$  level.

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**Framing on Prejudice and Predictability of Personality Traits on Openness to Diversity**

*Nathan Taylor, Shawn N. Thompson, Sarah Wheelwright, Nicole E. Nordello, Samantha N. Burroughs (Azenett Garza)*  
*Poster Presentation*  
*Psychology*

There has been an increased interest in investigating the differential impact between multicultural and assimilation strategies (Richeson & Nussbaum, 2004; Wolsko, Park, Judd, & Wittenbrink, 2000). The current study wished to replicate Richeson & Nussbaum's study investigating whether priming participants with multicultural or assimilation ideology would affect implicit and explicit prejudice. The current study also wanted to assess the predictive ability of certain personality traits that have demonstrated to predict attitudes about openness to diversity or prejudice, the desire to learn and to accept other cultures, and the symbolic threat experienced towards immigrants. Participants were presented with a situation that described the U.S. as being culturally diverse or assimilated, followed by an implicit measure and explicit measure of prejudice, symbolic threat, and a Multicultural Personality Questionnaire (van Oudenhoven & van der Zee, 2002). Contrary to previous findings and predictions (i.e., Richeson & Nussbaum, 2004), the manipulations did not have a significant effect on measures of prejudice or symbolic threat. The personality trait open-mindedness significantly predicted desire to learn about and accept other cultures whereby greater open-mindedness predicted greater desire to learn about other cultures. It was found that the personality trait of social initiative significantly predicted symbolic threat.

**Cultural vs. Moral Diversity: Effects of Framing On Prejudice**

*Nicole E. Nordello, Sarah R. Wheelwright, Shawn N. Thompson, Samantha N. Burroughs, Nathan Taylor (Azenett Garza)*  
*Poster Presentation*  
*Psychology*

The U.S. has been described as a "melting pot" for centuries; the idea that different ethnic groups, cultures and religions mix together to produce new cultural forms and unite the nation. However, social psychologists have found that group conflict and inequality are omnipresent in society; a "harmonious melting pot" has not been achieved (Pratto, et. al, 1994). This study was designed to assess the predictability of ethnic out-group prejudice based on certain personality traits (such as open mindedness, cultural empathy, etc). More importantly, it also investigated whether four created scenarios depicting the U.S. as being either culturally and morally diverse, culturally diverse but morally assimilated, culturally and morally assimilated, or culturally assimilated but morally diverse affected how participants responded to an ethnic out-group and their openness to ethnic and religious diversity. It was found that when participants were told that the U.S. was culturally diverse, they exhibited more prejudice and less endorsement for diversity, the opposite of what was hypothesized to occur. In terms of the predictive utility of personality traits, it was found that individuals who are higher in cultural empathy and open-mindedness exhibited less prejudice towards ethnic out-group members and greater openness to ethnic diversity.

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# Abstracts

## **Personality Traits and Quality of Contact Predictive of Out-group Prejudice in Individuals Who Have Lived in Another Country**

*Samantha N. Burroughs, Nicole E. Nordello, Nathan Taylor, Shawn N. Thompson, Sarah R. Wheelwright (Azenett Garza)*

*Poster Presentation  
Psychology*

The purpose of the current study was to investigate how the experience of living in a foreign country is influenced by the amount, quality and type of contact with individuals of a foreign country and personality traits (such as cultural empathy, emotional stability, and social initiative). Furthermore, the study explored how these variables impacted attitudes about learning about different cultures and religions, and attitudes about out-groups in their home country. Participants recruited for this study included military members, religious missionaries, foreign exchange students, and students who had not lived in a foreign country. Correlations, simple regressions, and hierarchical regressions have been conducted. Results demonstrate that of the personality traits, openmindedness and flexibility are among the most reliable and strongest predictors of attitudes towards out-groups and desire to learn about other cultures; whereby the more open-minded individuals are the more they are open to and seek to learn about other ethnic groups and cultures and the less prejudice and threat they express towards out-groups. In addition, quality of contact is the most predictive of prejudice and threat towards out-groups, whereby the more positive the contact the less prejudice and threat reported towards out-groups.

## **The Effects of Fatigue on Cognitive Inhibition, Susceptibility to Affective Conditioning and Implicit Racial Bias in Police Officers**

*Christian Peterson  
(Azenett Garza)*

*Poster Presentation  
Psychology*

As fatigue and stress increase, overall cognitive functioning tends to decrease. In some circumstances, these effects extend to social interactions whereby reliance on stereotypes increases. This study was designed to assess the effects of fatigue on cognitive functioning; in particular, the use of racial stereotypes by police officers. Twelve correctional officers participated during their regularly-scheduled shift change. Data were collected at the end of the participants' shifts at both the beginning and the end of their work periods. Participants were asked to fill out a series of self-reported measures of sleep habits and fatigue. In addition, participants completed a series of cognitive tasks, two of which have implications in the likelihood of relying on stereotypes. Finally, salivary cortisol samples, which are indicative of levels of stress experienced, were taken at the end of the testing session. Results demonstrated that as officers became more fatigued across their work period, they were more likely to make errors on stereotype incongruent scenarios (i.e.; a White suspect as Guilty) and were quicker in responding to stereotype congruent scenarios (i.e.; a Black as Guilty). Understanding how fatigue and stress affects cognitive ability may prevent individuals and law enforcement personnel from making tragic mistakes.

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**Current Trends in Help-Seeking Behavior and Perceived Stress in a College Population**

*Kimberlee Taylor*  
(Theresa Kay, Dianna Rangel)

*Poster Presentation*  
*Psychology*

While in college, students experience varied bouts of stress. Although physical manifestations of stress may be more evident, one's psychological interpretation may alter the perception of the severity of stress, either undermining or embellishing the degree to which the stressor is detrimental. Thus, similar stressors may be interpreted in differing manners by different people. As such, we propose that as perceptions of severe stress increase, efforts to seek stress relief may become more prevalent. As such, perceived stress may mediate and facilitate efforts to seek help in alleviating stress. The present research consisted of three samples: 1) the first sample (N=154) took no proactive steps to relieve stress, 2) the second sample (N=78) demonstrated a moderate effort to relieve stress in a proactive, though not clinical manner, 3) the third sample (N=98) demonstrated active, clinical efforts to seek help in relieving stress. A between-subjects design compared differences in perceived stress between the three sample groups. Analysis of variance statistical procedures (ANOVA) revealed significant differences between the perceived stress levels of all three samples: sample 1: M=14.34; sample 2: M=19.46; sample 3: M=25.37,  $p < .002$ . These findings suggest an important relationship between the manner of stress perception and displayed help-seeking behavior.

**Education and Outreach at Weber State University: Brain Awareness Week**

*Kimberlee Taylor*  
(Matthew Schmolesky)

*Poster Presentation*  
*Psychology*

Throughout the Weber State University collegiate experience, community outreach projects are encouraged as Weber State both creates and bolsters relationships with new or existing community partners. "Brain Awareness Week," an annual event sponsored by The Society for Neuroscience, is an opportunity for Psychology and Neuroscience students to become involved in the community through sharing their knowledge of the brain's incredible functions. For the 2008 Brain Awareness Week, Weber State students conducted outreach and educational programs at local public schools, after-school programs, preschools and by advertising on campus and in local businesses. In 2008, student volunteers were Psychology and Health Professions majors who were well versed in brain anatomy and physiology. As such, students in the local schools, preschools and after-school programs were given the unique opportunity to dissect different specimens, such as sheep brains and bovine spinal cords.

Currently, plans for Brain Awareness Week 2009 are underway with double the number of volunteers from last year. Teaching demonstrations have been scheduled at two elementary schools, one junior high school, three high schools, two after school programs and two preschools. These community partnerships enhance the Weber State University experience for college students and supplement the education of the surrounding community.

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# Abstracts

## **A Longitudinal Study of Adolescent Risk-Taking**

*Kimberlee Taylor*  
(Eric Amsel, Leigh Shaw)

*Poster Presentation*  
*Psychology*

Adolescents participate in risky behaviors despite the fact that such behaviors are associated with a variety of negative outcomes (Johnston et al., 2002). Why then do adolescents engage in such risk behaviors? As such, the present study examined middle and older adolescent's views of risky behaviors from a social domain perspective (e.g., Turiel, 1983), which asserts that adolescent's risk taking is related to their understandings and evaluations of the moral (preventing harm to others), prudential (preventing harm to self), conventional (upholding social norms), and personal (asserting personal choice) aspects of risk taking. Risk-taking among adolescents (N=157) examined these realms: alcohol use, drug use and reckless driving. Risk intentions (avoidant, opportunistic, curious, risk-seeking) and subjective norms (teen's perceptions of friend's engagement in and opinion of risk-taking) were obtained in each realm; socio-moral judgments and justifications were obtained in a baseline (no socio-moral information) and a final (socio-moral information provided) scenario. Teens who were primarily avoidant in their risk-taking (N=72) were assessed again after six months. Results indicated that teens tended to display more curious intentions toward risky behaviors in the follow-up assessment. These changes appeared to be influenced by positive subjective norms and social appraisal of risk-taking.

## **The Effects of Violent Video Games on Physiological Stress Response**

*Jeff Davis*  
(Lauren Fowler)

*Poster Presentation*  
*Psychology*

Video games have become controversial and heavily researched due to their increasingly violent, realistic content. In the past, researchers have focused on psychological effects, such as aggression and anxiety, which people may experience playing video games. Fewer studies focus on physiological effects of video games. This study was designed to assess the physiological stress response caused by playing violent video games. Salivary cortisol may be a good indicator of stress arousal because levels tend to increase during stressful events. To assess the effects of violent video games on cortisol levels, 21 male participants played Halo 3 in groups of 4. Each participant played for 15 minutes against other members of his group. Participants gave a total of 4 saliva samples (before playing, immediately after, and then 15 and 30 minutes after playing). A repeated-measures ANOVA was used to analyze differences in salivary cortisol levels across time. Results indicated that participants' cortisol levels were significantly different 45 minutes post-baseline. Participants who played more than 3 hours/week showed an even greater surge in cortisol 45 minutes post-baseline. These results indicate that violent video games may cause a stress response in its players, especially those who play video games frequently.

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**Standpoint Variables: Super-Mom or Obsessed Mom?**

*Madelyn Jones  
(Susan Hafen)*

*Oral Presentation  
Social Work/Gerontology*

On January 26, 2009 Nadya Suleman gave birth to eight children in Bellflower, California. This event has sparked curiosity, fury, and outrage worldwide, as well as some sympathy and admiration. The event is controversial because of the mother's situation—she is single, unemployed, living in her parent's home, impregnated by in-vitro fertilization and now has fourteen children all under the age of eight (CBS News, 2009). The public's varied reactions may be partly explained by the economic atmosphere, as well as individuals' beliefs and perceptions. Harding and Wood's Standpoint theory argues that each group views an event differently based on their position in society or standpoint, "a place from which to critically view the world around us" (Griffin, 2008, p. 441). The intent of this paper is to examine the correlations between an individual's standpoints and how they view this event. Surveys given to students at Weber State University will correlate several personal background variables with their attitude towards the Suleman octuplets. Those variables will include sex, religious/nonreligious, marital status, and parent status. This information will be useful because it will indicate whether certain standpoints can predict attitudes in this situation.

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*Notes*

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