UGRGC Program Fall 2010

POSTER SESSION: PHYSICAL & LIFE SCIENCES
MC Crossroads
4:30 PM

Daniel Zimmer, Electrical Engineering
Jason Schofield
David Call
Kyle Wilkins

Levitating Light Bulb

Through the use of wireless power transfer, we will light a small light bulb that will be suspended by a magnetic field. The light bulb will consist of a number of small LEDs packaged into a standard household light bulb which will receive power from reciprocating resonance coils, one placed in the base of the apparatus to transmit the power, and another in the base of the bulb to receive the power through induction. This bulb will be magnetically held in place through the use of a Hall Effect sensor at the top of the apparatus, coupled with a small rare-earth based electromagnet, which interacts with a small rare-earth magnet in the top of the bulb to maintain lift.

Brandan Lym, Exercise Science
Natalie Scherher
Ron Garner
Cassie Robertson

A New Method for Determining Exercise Intensity to Meet Cardiovascular Needs

The purpose of our study was to determine whether work at lactate threshold (LT) or ventilatory threshold (VT) is optimal for improvements in cardiovascular fitness. 27 college-aged students (7 females, 20 males) participated in the study. Subjects were separated into groups based on fitness levels, sedentary (SED), average (AVG) and fit (FIT). Subjects participated in a graded exercise test (GXT) to determine LT followed by a VO2max test. VO2 at LT was used to determine work rate for a final run where time to exhaustion (TTE) was recorded. No differences (p = 0.079) in TTE were found between groups SED, AVG, and FIT, therefore all groups were combined for further analysis. TTE = 33.96 ± 10.97 min; HR at LT = 167.77 ± 9.12 bpm; RPE at LT = 13.19 ± 1.36; VO2max = 53.35 ± 7.67 ml/kg/min-1; VO2 at LT = 39.46 ± 6.02; ml/kg/min-1. Percent VO2max at LT = 74.04 ± 5.26% TTE was not related to VO2max (p=0.9; r = -0.009). Additionally, TTE was not related to VO2at LT (p = 0.24; r = -0.2). The study determined no correlation between TTE and fitness level measured as both VO2max, and VO2 at LT. General guidelines typically recommend between 30-60 min of exercise most days of the week. Other guidelines use RPE, % VO2max, or HR to determine exercise intensity. We found that by exercising at LT, total exercise time fell within the recommended guidelines of the ACSM and the CDC for both duration and intensity. Exercise at LT or VT fell within the recommended guidelines for duration of exercise regardless of fitness level. We recommend using LT or VT as the guideline for determining exercise intensity.
Kevin McGuire, Geology

The Geochemistry of the Chalk Hills Member of the Catahoula Formation

The Catahoula Formation is found throughout eastern Louisiana and Texas and is composed of layers of fine to coarse-grained sandstones, shale, and volcanic ash. This research focuses on providing a petrographic and geochemical description of the Chalk Hills Member of the Catahoula Formation. The ash is composed of bubble shards, the majority being hydrated with a minority remaining glassy, and less than five percent subhedral to euhedral sanidine crystals. A TAS plot indicates that the ash is dacitic in origin. Spider diagram comparisons with EMORB, OIB, and upper and lower crust show strong negative K, Sr, and Ti and positive Th anomalies. They also indicate that the Catahoula ash is close to OIB in composition. This implies a magmatic plume-sourced eruptive center as the possible source of the ash. The REE trend shows a strong negative Eu trend, which, coupled with the negative K and Sr anomalies in the spider diagrams, suggests a strong effect of plagioclase/sanidine crystallization on the magma evolution. In addition, a comparison of the ash/OIB REE trends against elemental partitioning in rhyolites produces trends that nearly mirror each other, suggesting that plagioclase fractionation was the dominant process in the final magmatic evolution of the sample.

Clayton Pace, Geology

Provo Standstill Wave Energy

During the late Pleistocene, Lake Bonneville was at its highest level known as the Bonneville Highstand. The lakes threshold failed causing the lake surface to drop more than 100 m to the level known as the Provo Standstill. The landforms that developed during the Provo Standstill were determined in large part by the shoreface wave energy. Wind velocity, direction, and storm duration are factors influencing wave energy; however, this data is unknown. In order to determine Lake Provo wave energy, the fetch and slope were calculated at 500 m intervals along the shoreface. Fetch and slope data can be analyzed alongside the geology of the shoreface in order to determine the correct wave energy. Elevation corrections were made to the Provo Lake data accommodating the isostatic rebound that occurred because of the decreased load on the crust. Examination of the Lake Provo landforms in combination with the fetch and slope calculations help us understand the wave energy that was present during the Provo Standstill.

Meesha Ard, Geology

Petrology of Basaltic Pillow Lavas in Teton Canyon, Idaho, U.S.A.

Three basalt lava flows are exposed near the mouth of Teton Canyon, Idaho, U.S.A., each with a base of pillow lavas. These flows erupted from a shield volcano on the Rexburg bench, south of the canyon and dammed the river at three levels. The absence of paleosols between the flows indicates they were emplaced shortly after one another—likely from the same eruptive event. The basalts contain phenocrysts of euhedral plagioclase, euhedral to subhedral olivine, & Fe-Ti oxides. The oldest & youngest flows also contain euhedral clinopyroxene. Like other normal Snake River Plain basalts, these flows are ferroan, calc-alkalic, medium-K2O, and Nb-rich. The younger flows contain progressively smaller plagioclase; more euhedral olivine phenocrysts; lower Cr & Ni concentrations; and higher Rb, Zr, & Ba concentrations—indicating that the magma system became progressively less evolved as the eruption progressed. This study is part of a larger study to understand the nature of basalt-river interactions in southeast Idaho.
The Energy Expenditure of Ballroom Dance

Ballroom dance is quickly becoming a popular form of physical activity. There have been limited studies regarding the energy expenditure of ballroom dance. The purpose was to determine the energy expenditure of ballroom dance and compare these results with current ACSM and CDC guidelines for physical activity. Participants consisted of 24 college-age individuals (12 male, 12 female). Oxygen uptake was recorded and used to determine energy expenditure during 30-minutes of ballroom dance (waltz, fox trot, swing, cha cha). Dances were performed in four-minute intervals with two-minute rest periods between each dance. The swing dance was repeated in order to reach 30-minutes of total activity. Mean energy expenditure during the 30-minutes of total activity including rest was $5.88 \pm 1.7$ kcal/min. Energy expenditure during the waltz ($6.01 \pm 1.8$ kcal/min), fox trot ($6.01 \pm 1.9$ kcal/min) and cha cha ($6.41 \pm 2.1$ kcal/min) were considered moderate activity according to CDC and ACSM guidelines. The energy expenditure of both swing dances ($8.14 \pm 2.5$ and $7.92 \pm 2.5$ kcal/min) were considered vigorous activity by the same guidelines. Ballroom dance is an acceptable form of exercise and can be used to reach recommended prescription guidelines for physical activity.

Histone Deacetylase (hDaC) Inhibitors Induces Apoptosis and Inhibits Cell Proliferation in 7TD1 Cells: Implications in Treatment of Multiple Myeloma

Suberoylanilide hydroxamic acid (SAHA) is a histone deacetylase inhibitor that has become a promising antitumor agent in Multiple Myeloma. In this study, we examined the effects of the HDAC inhibitor SAHA on the cell proliferation and apoptosis in both dexamethasone sensitive (7DT1) and resistant (7TD1-DXM) Multiple Myeloma cells. Apoptosis was determined by flow cytometry analysis of Annexin V binding populations. Acetylated histones and apoptosis-associated proteins were detected by Western blotting. SAHA (0–20µM) induced apoptosis in a concentration- and time-dependent manner in the two cell lines: 7TD1 (IC50 of 0.05µM) and 7TD1-DXM (IC50 of 0.5µM). SAHA treatment caused an accumulation of acetylated histones (H3), an increase in Bax proteins, a decrease of Bcl2 and Bcl-XL proteins. Treatment with low doses of SAHA significantly increased the sensitivity of both cell lines to dexamethasone. These finding will be of enormous benefit to clinicians and patients. Inhibition of HDAC may decrease the dose of adjunct chemotherapy used in routine clinical practice and also prevent the development of resistance.
Petrology of the Igneous Rocks of the Centennial and Henry’s Mountains, Idaho

The Centennial and Henry’s Mountains are located near the Continental Divide on the Idaho-Montana border and contain ~40 km³ of Eocene shoshonite aa lava flows that overlie local Paleozoic strata and are cut by feeder dikes. These rocks are exposed in three discontinuous areas each roughly 5 km (E-W) wide in a 10 x 30 km region. The youngest flow from the westernmost area has a 40Ar/39Ar age of 49.94 ± 0.038 Ma. Because these rocks are located between the Absaroka (to the east) and Challis (to the west) volcanic fields their petrogenesis may yield useful insights into the Eocene petrotectonic history of western North America. The volcanic features, petrography, and composition of the Sawtell Peak shoshonites are remarkably uniform. The flows are sometimes vesicular or amygdaloidal, are crystal rich, and contain euhedral cpx phenocrysts, commonly-altered ol phenocrysts, and microlites of plag and Fe-Ti oxides. Major and trace element compositions suggest that these rocks erupted during (at least) three eruptive episodes; are compositionally similar to the mafic rocks of the Absaroka (rather than the Challis) volcanic field; and include a significant subduction zone compositional component—likely from the subduction zone that existed beneath western North America during the Eocene.

Affordable Green Energy

Alternative energy sources such as hydro, thermal, and wind are becoming very popular in today’s “Green” environment. This semester we looked specifically at using wind to develop a relatively inexpensive generator using an array of permanent magnets. Using E&M principles we designed and built a working 3-phase dc generator. Our target power output was 400 watts (enough to power a small dwelling in a developing country). Our design budget was $300.00. The purpose of this project was only to develop the actual generator. The mechanical means to turn the generator such as a windmill, turbine, or other source were outside the scope of the project.
Erika Hales, *Psychology*

**Gender Differences in Body Satisfaction and Estimated Weight**
For my study, I wanted to see whether males and females at BYU-Idaho tended to overestimate their weight or underestimate it and if there was a difference between the genders. I also wanted to see whether body satisfaction played a role in the estimation of weight. The literature shows that females report more body dissatisfaction than males. However, on the issue of whether a specific gender tends to over or underestimate more than the other, research conclusions can be found to support either viewpoint. I hypothesized that women would overestimate more than men and men would underestimate more than women. After conducting this study, I observed which findings in the literature most closely resembled my results.

Kacie Birtcher, *Psychology*
Veronica Zanni

**Motivation: What Factors Encourage Students to Graduate?**
We want to see what the contributing factors are in student’s motivation to complete their education. In order to gain quantitative data we created and sent out a survey via email to 500 students from freshman to senior year to evaluate what motivates them to graduate. In analyzing our feedback, we have discovered that more internal factors, such as satisfaction and self-fulfillment held more weight than external factors, such as good income and career aspiration.

Matt Nearents, *Psychology*

**The Faces of Cars: Impacts on Trait Attribution**
My study aims to explore how people see facial expressions in cars and anthropomorphize human characteristics onto cars in the form of trait attribution. My study takes four cars, removes the identifying information and asks participants to rate the car on two personality characteristics: friendly-hostile, and submissive-dominant. Participants are also asked to rate whether they perceive a facial expression on the car front and which universal expression they see.

Travis Bowers, *Psychology*

**Do Grades Affect Student Evaluations?**
The purpose of this study is show evidence that student grades affect instructor evaluations at Brigham Young University-Idaho. Evaluations from six colleges were collected from the winter 2010 semester. Three of the colleges had high GPA’s and the other three had low GPA’s. From each college 2 classes were taken. One of the classes had a high GPA and the other had a low GPA. For this study we hypothesized that a high class GPA’s correlates with a high instructor rating; we used a point biserial correlation to show this. We also hypothesized that a student’s expected grade will significantly relate to a high or low class GPA; we also used a point biserial correlation to show this. Our results show that the grade’s students receive in a course affects their rating of the instructor and the course.
Individualistic and Structural Attributions of Poverty in the LDS Population

Because of the importance and prevalence of poverty in the world there has been a significant amount of research done on the lay attributions of poverty and the subsequent influence on helping behavior. The purpose of this study was to further the work on how religion mediates poverty attributions by extending the research into an LDS population. 144 BYU-Idaho students filled out an internet based survey. The survey used a 5 point scale to measure students attributions of poverty. A factor analysis revealed six factors that accounted for 62.9% of the variance, while an ANOVA test showed that an individualistic and structural attributions were used more than fatalistic attributions to explain poverty. Because of the high Conservative influence in the LDS sample we hypothesized that the individualistic attribution would be the more popular. Our hypothesis was only partially supported. It appears that religious influence reduced the effect that political orientation exerted on poverty attribution.

The Effect of Warm and Cool Colors on the Desirability of Food

Many factors contribute to the overall desirability of food. On such factor is the color of both the food, and the packaging it is presented with. This study investigates the affect of the warmth or coolness of the packaging color of a food has on its overall desirability. It proposes that warmer colors have a greater positive impact on food desirability then cooler colors.

The Comparison of Methods for Coping with Stress in Combat Situations from the Vietnam, Gulf, and Iraqi/Afghani War

This study discusses how stress affects militants within the United States Army, and does a comparison of lifestyles to analyze how each person handled their respective stressful situations. This is a pilot study of seven people because of limitations placed on the study itself, and it was conducted here on the BYU-Idaho campus. This study is a Mixed Methods study. There was an Interview conducted with each person and a questionnaire given to each person to better measure it from an empirical stance.
ORAL SESSION: LANGUAGES & LETTERS  
MC 176A  
6:45 PM

Sarah Baird, English  

Animal vs. Human: Exploring Carnality and Rationality through Zoomorphism in “The Horse Dealer’s Daughter”

D.H. Lawrence’s short story, “The Horse Dealer’s Daughter,” has received very little attention in the world of critical analysis. Those who have written on it have mainly focused on how the story is a journey from misery to an awakening and spiritual re-birth. All of these critics make valid points that I agree with. However, I take a different approach to this famous short story. In the research I have done, none of the critics take a deeper look into the animal imagery within the story. There is too much animal imagery contained in the story for it to be ignored. I argue that in “The Horse Dealer’s Daughter,” Lawrence compares the striking contrasts between the carnal human being and the rational human being through his use of zoomorphism, or the giving of animal mannerisms to human beings. Through my analysis, the audience will discover the natural or carnal instincts of human beings when faced with desperation, which can lead to irrational thinking. Through my analysis of the heroine’s decision to walk away from these instincts, readers will also learn how rationality overcomes carnality.

7:00 PM

Benjamín Ocampo, History  

Steinbeck’s Marginal Man in Tortilla Flat  

The examination of the marginalization of Danny of Tortilla Flat, the main character of the novel demonstrates the perils of the marginal man and how in the end he cannot belong to two societies without ultimately choosing one or the other, and losing his previous identity. In short, Danny is an example of the marginal man and through this marginalization his primitive identity is challenged by civilized society and is ultimately lost.

7:15 PM

Rosa Lea V. Ojeda, English  

The Gift of Exposure  

O. Henry’s short story, “The Gift of the Magi” has typically been viewed as the ultimate portrayal of altruism. Henry’s stories are known for their surprise endings of bringing good out of bad situations. Could it be possible that the “good” he has written actually disguises the bad? In “The Gift of the Magi” Henry attacks women. For example, the first description of Della is that of a sobbing woman, who does nothing but think about how little money she has. Her hair, representing her beauty, is her most prized possession. Her beauty is everything to her, and to her husband. When she cuts her hair, she doubts her self-worth, showing us that a woman is only as good as her looks. Della continually asks for her husband’s approval of her looks, implying that a woman’s worth is determined by man. That Della loses her worth when she cuts her hair is evident because Jim never actually tells Della she is pretty. Henry also makes a point to describe Jim as “needing a new overcoat” and “without gloves.” Instead of buying Jim what he actually needed, and what she could afford, Della chose to sell what was important to her for a man. Della sacrificed a part of herself for her husband because women’s needs come secondary to men’s. Henry wrote “The Gift of the Magi” while he was in prison, calling his credibility into question. Many women in Henry’s life died, causing him to view women as weak and feeble and to blame them for his grief. Henry’s seemingly sweet tale blinds readers to what the story actually does: demeans, objectifies, and marginalizes women through the use of diction, tone, and symbolism.
New Texts from Social Media: Tweets from Beyond the Great Firewall

The introduction of Web 2.0 social media has given a new voice to millions of Internet users all around the globe; nowhere has this been more apparent than in China and Far-East Asia. Since the fiber-optic boom of the mid-1990s, the world has become connected to a previously unfathomable stream of communication and information that is changing not only individual and social behaviors, but is affecting highly influential topics like global politics as well. With a focus on current Chinese social media trends, particularly in regard to their adoption of the micro-blogging platform Twitter, this study will observe how new and influential literary texts are being created, despite opposition from an increasingly aggressive Internet censorship regime originating from the nation’s communist government. The study will further analyze the authors of these new texts, namely native political dissidents who are taking advantage of the latest Internet technologies, to inform and voice their criticisms to not only their oppressors, but the rest of the world. Although the phenomenon is relatively new and still in its early stages, the research will reveal historical precedents to these dissident texts that stretch as far back as the days of imperial rule, to events that have occurred as recently as within this last generation. In addition, the study will speculate Twitter’s potential role in encouraging political reform within the Chinese mainland.

A Matter of Choice: A Critical Look at C.S. Lewis’ The Great Divorce

At troubled times like these, the tendency to ask the age old questions of “what is my purpose?”, “why am I here?”, and “where am I going” seem to become more important. It is a mystery that men for thousands of years have tried to solve. The unknown world of the afterlife is so easily attained, yet many do not have any clue to what it may be like. Is there really a heaven or a hell? And if there is, what do you do to get there? C.S. Lewis, in his book The Great Divorce, attempts to answer these questions. The focus of his book revolves around a trip from Hell up to Heaven. Each character that arrives is given the opportunity to make a change in their life that would allow them to stay, but many refuse such an offer. Critics have argued a variety of reasons regarding the Lewis’s purpose: teaching doctrine of good vs. bad, the principles of turning toward God, and the description of the righteous and evil—but they have only barely glazed over one of the most important concepts of the entire novel—the principle of agency. An understanding of this concept, (sometimes described as the innate power each man has to make decisions for themselves—regardless of anything or anyone else), is critical to the overlying message of the novel. Everything ties back into this principle. Once the reader sees how this fits, they can understand more fully why the difference between Heaven and hell is a matter of personal choice.
**Oral Session: Life Sciences**

**MC 174A**

6:00 PM

Garrett Weldon, *Exercise Physiology*
Dane Owens

**Complex vs. Complex-Eccentric Training on Short Term Vertical Jump Height**

Recent evidence suggests that additional loading during the eccentric phase of lower body plyometric exercises may illicit greater increases in vertical jump height (VJH) when compared to results without additional loading (Myszka, 2009). The purpose of this study was to compare the effects on short-term VJH when additional loading during the eccentric phase of the plyometric portion of complex training (combination of resistance training and biomechanically similar plyometric exercises on each training day) is added to a standard complex training program. Ten subjects were randomly assigned to one of two training programs: complex training (CPX) or complex-eccentric training (CPXE). Five other subjects that did not want to participate in resistance or plyometric exercises were assigned to a control (CON) group. Each subjects’ VJH was recorded pre and post training. During the 5 ½ weeks of training both CPXE and CPX groups performed the same resistance protocol but differed in how the eccentric phase of the plyometrics were done. A one way ANOVA was used to compare changes. Vertical jump in the CPXE group (8.64 ± 2.75 cm) increased significantly (P < 0.05) when compared to both the CPX group (3.81 ± 2.69 cm) and the CON group (0.64 ± 0.73 cm). VJH for the CPX group alone did not significantly (P > 0.05) increase when compared with the CON group. In a 5 ½ week period of training CPXE increases VJH significantly when compared with CPX or CON.

6:15 PM

Aly Barthelmes, *Exercise Science*
Allison Eliason

**The Effect of Macronutrient Breakfast on Overall Calorie Intake**

Eating breakfast each morning is very important as it provides necessary energy. The type of macronutrient found in breakfast may influence type of food eaten throughout the day. Eating breakfast may decrease overeating and promote healthier eating, thus halting the steady rise of obesity. The purpose of our study is to determine whether a breakfast composed of a single macronutrient will affect the total caloric intake consumed each day. Thirty test subjects between ages 18 and 40 were recruited for the study. Each person was given a breakfast to be eaten every morning for five days consisting of either protein (chunk light tuna), simple carbohydrate (Berry Colossal Crunch cereal), or complex carbohydrate (old fashioned rolled oats). Test subjects recorded their food intake daily and researchers used that data to estimate calorie consumption per day for each individual. Data was then compared between individuals and among groups.
**ORAL SESSION: LIFE SCIENCES**  
**MC 174A**  
6:30 PM

Joshua Cady, *Biology*  
Chloe Stenkamp-Strahm  
Ailene MacPherson

**Neuropathy of the Enteric Nervous System Due to a High Fat Diet**

Mice fed a 72% fat diet have been shown to have symptoms of enteric neuropathy, insulin resistance and obesity at 8 and 16 week study periods. In an effort to monitor the early onset of these changes, mice were analyzed after a 2 week period. Data concerning glial cell integrity, sensory and excitatory motor neuron activity showed mostly non-significant values between test and control mice.

6:45 PM

Tyler W. LeBaron, *Exercise Physiology*

**Functional Water for Prevention and Treatment of Diseases**

The incurable, chronically ill, or otherwise afflicted have been pilgrimaging to Nordenua to drink the so-called healing waters. Clinical trials consisting of over 2000 diabetic patients have verified that these “natural reduced waters” can indeed improve important blood parameters. It has been revealed that the main agent responsible for these benefits is hydrogen gas. Recently, hydrogen has been extensively studied for its therapeutic properties as a regulator, antioxidant, anti-inflammatory and its anti-apoptotic protective effects. Electrolyzed reduced water (ERW) exhibits a negative oxidation reduction potential and zeta-potential, supersaturated with nanosize hydrogen bubbles existing in negative colloidal forms around the hydroxides. ERW was approved by the Japanese Ministry of Health and Welfare in 1965 for its therapeutic effects. Many studies have been published concerning its application; including, prevention and treatment of neurodegenerative diseases and atherosclerosis, reductions in pro-inflammatory cytokines, amelioration of impaired lipid and glucose metabolism, prevention of pancreatic β-cell dysfunction, suppression of cancer cell proliferation, and longevity. Though there are numerous studies on these topics, a comprehensive literature review does not exist. This will be the first review written, which will help move the scientific community forward in new directions for the prevention and treatment of diseases.

7:00 PM

John Cornelius, *Biology*  
Ben Nelson  
Jose Alvarez  
Steven Miles

**Phagocytosis as a Viable Means of Horizontal Gene Transfer**

Horizontal Gene Transfer (HGT) is increasingly noted as the cause of the appearance of species specific sequences in other, non-related organisms. Previous work has indicated phagocytosis, the engulfing of extracellular bodies for nutrition, as a potential mechanism of transferring viable DNA sequences into *Dictyostelium discoideum* amoeba. As an extension of this work, we here investigate phagocytosis as a viable means of HGT in murine (mouse) microglia, the resident white blood cells in neural tissue. Successful insertion of transferred genes into these cells represents a novel mode of peptide delivery to the central nervous system.
**ORAL SESSION: LIFE SCIENCES**
**MC 174A**

7:15 PM

Jared Roberts, *Exercise Science*
Chris Madsen
Hyrum Anderton

**The Effects of Progressive Static Stretching on Anaerobic Power Performance**

Perceptions of a single bout of static stretching have been negative in correlation with anaerobic power performance. Studies have not concluded whether static stretching over an extended period of time will increase or decrease anaerobic performance. The purpose of this experiment is to prove that progressive static stretching over time will increase overall anaerobic performance. Nine active participants were assigned randomly to one of three groups and asked to stretch either before or after training. Testing was completed both before and after the study.

7:30 PM

Shaun Huntington, *Exercise Physiology*
Ryan Daw
Jessica Mearns

**How Unstable Training Affects Performance**

Performance in sports demands a high degree of coordination, muscle control, and balance, each of which are stressed by training the body in an environment that requires heightened proprioception and multiple muscle groups to be recruited simultaneously. When an individual is training on an unstable surface, balance and proprioception are increased. The purpose of this study was to determine if training on unstable surfaces had an effect on lateral movement, explosive power, and core strength. Ten male and female students ages 18-25 enrolled in a beginning weight training class, volunteered, and were randomly assigned to this study. Two comparison groups were established and each performed a total body workout with unstable squats and lunges as the variable. Workouts took place twice a week for approximately one hour over the course of a six week training period.

7:45 PM

Nathan O’Dell, *Exercise Science*
Robert Welker
Rachel Carlisle

**Effects of Squat Training Barefoot**

Studies have been conducted showing that wearing shoes decreased the natural calcaneal stability of the subject compared to the barefooted subjects, therefore this decrease in stability caused more injuries in shod subjects then to those who were barefoot. The purpose of this experiment was to study whether or not a strength training program conducted barefoot, would have increased power output compared to those who trained with shoes measured by a 1 repetition maximum in the back squat. Eight untrained college students enrolled in a Brigham Young University-Idaho weight training class were assigned to two groups prior to training: barefoot (B) and shoes (S). All students participated in the same strength training regime as prescribed by the strength and conditioning research team designed for six weeks. Pre- and post-training tests were conducted for the 1 RM back squat. Analysis of Variance was calculated for all dependent variable and significance levels were set a p<.05.
Scott Fuller, *Physics*

**Research Capabilities of BYU-Idaho Telescope and Variable Star Study of RV Ursa Major**

The BYU-Idaho Physics’ Department recently acquired a 250mm f/4 Maksutov Newtonian telescope for use by undergraduates and faculty. In order for students to obtain quality images that can be used for research, they must understand several techniques. These techniques include focusing, autoguiding, and image reduction. Images are taken with a SBIG ST-7XME charge-coupled device (CCD). CCDs are employed in many modern astronomical research projects and their solid-state design allows for detailed photometric studies such as variable star studies. Variable stars are those whose apparent brightness changes with respect to the observer. RV Ursa Major is one such star. Following detailed research of RV Ursa Major, its period was found to be $0.46746 \pm 0.00395$ days. The phase curve of the star was also created based on the results of images taken over an 11-day period in August 2010. This research is designed to guide future projects by BYU-Idaho undergraduates and faculty members.

Brett Stone, *Mechanical Engineering*

**A Hybrid Future and How BYU-I Students Can Help Shape It**

The feasibility of BYU-Idaho students from the Mechanical Engineering, Electrical Engineering and Automotive Technology Departments designing and building a hybrid vehicle was researched. A wide range of project ideas were evaluated against several important criteria using a decision matrix. Items such as cost, available space and tools, project relevance, and number of students who would benefit were included.

David Perry, *Biology*

**Using Gamma Wave Energies to Map Defects in Metallic Surfaces**

Annihilation events of positrons and electrons give off two gamma ray photons. The typical energy associated with such an event is 511 keV per gamma ray—the common rest energy of the electron and positron plus their kinetic energy. However, this can be affected by the velocity of the electrons in the annihilation events. When positrons collide with high momentum core electrons the spread of gamma wave energies typically widens. For example, instead of giving off two gamma rays of equal energies, such an annihilation event may give off one ray of greater and one of equally less energy due to the Doppler Effect. Using standardized samples of annealed and shot-peened copper we hope to identify which wave energies are typical of surface defects and use that data to make two-dimensional defect maps in other materials. We expect to improve the precision of the techniques to the point of consistently mapping 15 x 20 cm objects. Obstacles to our goals include short- and long-term repeatability of the process (including sample positioning error) and consistency of results compared to error tolerance. Using 15-minute data segments we intend to measure and minimize margins of error and improve the limitations of these techniques.
Composition and Petrogenesis of the Basalts of the Island Park Area, Idaho

The Island Park area is located in the southwestern portion of the nested Yellowstone I, Henry’s Fork, and Yellowstone II calderas in eastern Idaho. The area centers on the 1.2 Ma partially-filled Henry’s Fork caldera and is largely surfaced by mafic rocks. Like the Yellowstone II caldera, the Island park area records the transition from rhyolite- to basalt-dominated magmatism that characterizes the development of volcanic fields in the Yellowstone Snake River Plain volcanic province (YSRP). This study reports the compositions of the mafic rocks of the Island Park area and infers their petrogenesis by comparing their compositions to those of YSRP rocks for which petrogenetic models have already been developed. Like other mafic rocks of the YSRP those in the Island Park area are dominantly ferroan; calcic to calc-alkalic; low- to medium-K2O; and Nb-rich. Three basic petrogenetic magma series have been identified for the YSRP: 1) A distinctly bimodal basalt-rhyolite (normal YSRP) series. This series is volumetrically dominant and consists of upwelling-mantle-derived basalts and associated anatectic rhyolites. Fractional crystallization and minor assimilation variably contribute to compositions of this series. 2) A magma mixing series. This series is much less common and is characterized by compositions derived from mixing of the basalt and rhyolite magmas of the bimodal series. 3) An extensive fractional crystallization series. This series is uncommon and consists of the fractionation products—including rhyolite—of the normal YSRP basalt of the bimodal series. The mafic rocks of the Island Park area dominantly belong to the normal YSRP series. Like the Yellowstone system, the Henry’s Fork system includes above-average abundance of the extensive fractional crystallization series. Unlike the Yellowstone system, the transition to mafic magmatism in the Henry’s Fork system occurred with very little magma mixing—both in volume and in the extent of mixing. These observations suggests that magmas belonging to the magma mixing and fractional crystallization series are more common during the transition from rhyolite- to basalt-dominated volcanism in the YSRP, and that the abundance and extent of mixing during the transition is determined by the size and persistence of the granitic magma body of the system.

Summer at NIST

The first project I did at NIST was with a solar cell. The purpose was to find the External Quantum Efficiency (EQE) by measuring the current across the solar cell and by finding the intensity of light at the solar cell. I then started working on measuring the index of refraction (n) and dielectric constant (k) of a thin film of iron on silicon. I etched pieces of the sample for different amounts of time in phosphoric acid and then measured n and k. I graphed the data to find trends. Research is continuing on both of these projects by my adviser, Dr. Nhan Nguyen.
Jacopo Lafranceschina, Physics

**Deformable Mirrors in Close Loop**

Using a deformable mirrors device and optical instruments, we set up experiment to correct user aberration in close loop system. We developed parts of Matlab codes that run the algorithm that makes the system work.

Patrick L. Norby, Geology

**Coral Abundance, Diversity, and Body Size Decrease with Depth in the Early Mississipian Lodgepole Formation, Montana**

The Early Mississippian (Kinderhookian) Lodgepole Formation of southwest Montana was deposited in an upper ramp to slope setting situated between the Antler Foredeep to the west and a broad carbonate platform to the east. Three primary depositional environments are recognized based on predictable differences in sedimentology and paleontology, including from onshore to offshore: 1) outer ramp, 2) proximal slope, and 3) distal slope to basin environments. Rugose and tabulate corals comprise a large portion of the macrofossil fauna in the Lodgepole Formation. Solitary rugose corals are by far the most common coral taxa and are found in all three depositional environments. In contrast, colonial rugose and tabulate corals are comparatively rare and mostly occur in outer ramp and proximal slope environments. Generally, coral abundance, diversity, and body size decrease from proximal to distal slope environments. Colonial corals from the proximal slope are largest and exhibit the best preservation. Sedimentological observations suggest that colonial corals may have been limited in abundance and size by frequent turbidite disturbance. The observed size ranges of coral colonies suggest that the frequency of terminal obrution events during the accumulation of Lodgepole sediments was on the order of a few years to decades.
Elizabeth Anderson, English
Arwen Behrends

A Study of Note-taking Methods

Many students believe “that taking notes in class . . . helped them understand a class lecture” (Huang, 2006). Our hypothesis is when notes are handwritten and then transcribed connection, personal use and application, and later reference to the material will be greater than if the notes are taken only by hand or only with computer software. 72 randomly selected undergraduate students from BYU-Idaho received a survey of 12 questions that assessed their note-taking method, and if they connected their notes to other classes and personal experiences. The participants were sent an email containing a link to the survey. Only the responses that indicated using either hand or computer note taking methods were used in the analysis. SPSS was used to run statistical analysis of the results. The results were not significant for any of the factors tested. However, these results indicate that the quality of notes taken, rather than the method that increases connections. The conditions were largely uneven, with only one participant that reported using the note taking method this study sought to analyze. Future research may be designed to determine if quality of notes rather than the note taking is a better indicator for connections made.

Scott Hurst, Psychology

Effects of Parental Divorce on Adult Children

The methodology of the proposed study is straightforward; married BYU-Idaho students will be asked if their parents are still married or divorced and at what age they married. After collecting the data, populations of students with divorced parents will be compared with those whose parents are still married. The aim is to find a statistically significant difference in the age at which students married depending on the situation of their family of origin.

David B. Thacker, Psychology

Determinants of Attractiveness in LDS Culture

This study aims to see whether women will rate a man’s facial attractiveness higher based on whether he has completed certain religious tasks. The main research question to be answered here is whether a man is thought to be more attractive depending on whether he has or has not served a mission for The Church of Jesus Christ of Latter-day Saints (LDS Church). The participants include 53 LDS women in the control group and 16 LDS women in the experimental group. Data was collected via use of a slideshow featuring a fake biography followed by two pictures of a man’s face. ANOVA was used as the statistical procedure.
**ORAL SESSION: SOCIAL SCIENCES**

**MC 176D**

**6:45 PM**

Arwen A. Behrends, *Psychology*

**Handling Conflict in Online and Face-to-face Groups**

The purpose was to describe the different methods that a decision-making group uses when dealing with an uncooperative member in an online and face-to-face setting. The hypothesis was that the online group would spend significantly more time in opposition and engage in more confrontative or disagreement type comments. Fifteen BYUI students were recruited from either a random selection from juniors/seniors or were recruited from a general psychology and a foundations class. Participants were assigned to either an online or face-to-face group. Each group was given the prompt to come up with three ways in which BYUI approved housing needs to change and was given 20 minutes to come up with a unanimous decision. The face-to-face groups were video recorded and transcripts of the online groups were kept for analysis. A confederate was used to create conflict within the group by disagreeing with the final decision. The transcripts were analyzed with the Group Working Relations Coding System and the Interpersonal Conflict Interaction Coding System. Analysis found that the online group spent significantly more time in opposition and was less likely to engage in negotiation and used stronger confrontative remarks than the face-to-face group.

**7:00 PM**

Cody Naccarato, *Psychology*

**Self Diagnosing Depression**

This research looks at people are their ability to accurately diagnose their own level of depression in comparison to the “average” American. I believe because of self-serving bias that the subjects will believe that they are not as depressed as the average American. This study uses 33 participants of BYU-I, both male and female, who filled out a survey for determining current levels of depression along with what they believe their own level of depression is. SPSS will be used to figure out if there is any correlation between the levels of depression and the self-diagnoses.

**7:15 PM**

Justin Larson, *Psychology*

Kathryne Reinholm

**Marriage Satisfaction and Gaming: Are the Two Incompatible?**

The purpose of our study is to examine the effect that multiplayer gaming usage and addiction has on marriage. Our independent variable is the usage of video games and their impact on marriage—this study will help provide a better understanding of: the gaming behaviors of married individuals who play Massively Multiplayer Online Role-Playing Game(s)—i.e. World of Warcraft, Eve, any/all Facebook—internal games (i.e. Farmville, MafiaWars, Farm Town, etc.)—gaming addiction, time spent gaming, satisfaction in gaming participation, interaction between spouses gaming together, and the resulting marital satisfaction levels of both individuals in the couple.
How Does Level of Outgoingness Affect Dating Frequency?

The main purpose of our study was to examine the links between an outgoing personality and frequency of dating, with particular interest in social interactions on college campuses with rate of dating. The participants in this study were 400 single BYU-I college students (200 males; 200 females). The students completed a computer survey on their self-perceived outgoingness related to their dating frequency. T-test analysis revealed that higher levels of perceived outgoingness relate to a greater amount of dates. We found outgoingness to be a highly desired trait in a potential date, whether the person identified themselves as outgoing or not.

A Mixed Methods Investigation Comparing the Happiness and Enjoyment Levels Between Five Majors at BYU-Idaho

As a place of continuous educational innovation, BYU-Idaho has implemented several programs over recent years to enhance the student experience. Researchers in the field of positive psychology continue to explore human flourishing and enhancing the human experience. This report brings both missions together in an effort to apply principles of positive psychology to increase the classroom experience and overall experience at BYU-Idaho, focusing principally on the tested hypothesis that happier people are more productive and enjoy benefits that others do not. 300 students selected from the business management, English, mechanical engineering, music, and nursing majors were invited to fill out a brief online happiness measurement to see if different majors scored differently from one another. They were also asked provide insight as to what they enjoy about their particular field of study. Although the differences in composite score results of the happiness measure were not statistically significant, the motivations and sources of enjoyment within each field of study were significant and insightful. These insights will provide instructors with ideas that will make their curriculum and approach to teaching and learning more enjoyable, and that this will increase the happiness and productivity of students at BYU-Idaho.