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WINTER SEMESTER
APRIL 4, 2013
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The Winter 2013

Thursday, April 4th, 2013

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### Agricultural and Biological Sciences
- **Biological & Physical Sciences, Poster Presentations**
  MC Grand Ballroom: 03:00 PM to 05:00 PM.

### Business and Communications
- **Economics, Oral Presentations**
  MC 176B: 04:30 PM to 06:30 PM.

### Engineering
- **Electrical & Computer Engineering, Poster Presentations**
  MC Grand Ballroom: 03:00 PM to 05:00 PM.
- **Mechatronics I, Poster Presentations**
  MC Grand Ballroom: 03:00 PM to 05:00 PM.
- **Mechatronics II, Poster Presentations**
  MC Grand Ballroom: 03:00 PM to 05:00 PM.

### Language and Letters
- **Creative Writing, Oral Presentations**
  MC 176A: 04:15 PM to 06:45 PM.
- **Literary Analysis, Oral Presentations**
  MC 176D: 04:30 PM to 06:30 PM.

### Physical and Mathematical Sciences
- **Mathematical & Economic Analysis, Poster Presentations**
  MC Grand Ballroom: 03:00 PM to 05:00 PM.
- **Physical & Analytical Chemistry, Oral Presentations**
  Tay 237: 04:15 PM to 06:30 PM.
- **Physics & Geology, Oral Presentations**
  TAY 111: 04:15 PM to 06:30 PM.
## Social Sciences

### Family & Relationships, Oral Presentations
MC 176C: 04:15 PM to 06:30 PM.

### Media & Society, Oral Presentations
TAY 105: 04:30 PM to 06:30 PM.

### Philosophy & Humanities, Oral Presentations
Tay 211: 04:30 PM to 06:30 PM.

### Political & Cultural, Oral Presentations
TAY 147: 04:15 PM to 06:30 PM.

### Psychology, Poster Presentations
MC Grand Ballroom: 03:00 PM to 05:00 PM.

### Sociology in Economics, Oral Presentations
TAY 247: 05:00 PM to 06:30 PM.

### Sociology in Education, Oral Presentations
TAY 248: 04:30 PM to 06:30 PM.

### Sociology in Health, Oral Presentations
TAY 120: 04:15 PM to 06:30 PM.

### Study of Abuse & Violence, Oral Presentations
MC 174A: 04:30 PM to 06:30 PM.

## Visual and Performing Arts

### Dance, Live Performance
MCS&D: 02:00 PM to 03:00 PM.

### Music Performance, Live Performance
MC 372: 03:00 PM to 05:15 PM.

### Visual & Performing Arts, Oral Presentations
TAY 140: 05:15 PM to 06:30 PM.

### Visual Arts, Poster Presentations
MC Grand Ballroom: 03:00 PM to 05:00 PM.
Analysis of Le Chatelier’s Principle Using Diet Coke and Mentos

Spenser Washburn, David Collins (Mentor)

Exploration of Le Chatelier’s Principle was done through the use of Diet Coke and Mentos. It was accomplished by proving that gas solubility decreases as temperature increases. The experiment has been done before, but only with room temperature sodas. This experiment shows that Le Chatelier’s Principle is a contributing factor in the eruption through the use of warm and cold sodas. The experiment was performed using roughly 00 C sodas and 220 C sodas. One Mentos was then placed in each soda and the eruption height was recorded. As has been shown in other studies, Diet Coke had the greatest eruption when it was warm. Cold sodas on the other hand had very small eruption heights. This experiment can be used in classrooms to show how Le Chatelier’s principle is used.

Analysis of the Decomposition of Sodium Bicarbonate and its Relation to Viscosity

Heather Jones, David Collins (Mentor)

A leavening agent is used in cooking to make dough or batter rise. One common leavening agent is sodium bicarbonate. This study was conducted to determine how the leavening properties of sodium bicarbonate are affected by solution viscosity. Mixtures of flour and water at varying viscosities and differing amounts of sodium bicarbonate (0.58, 1.15, 2.30 and 4.61g) were cooked and their change in height was measured. Change in height was directly related to viscosity and amount sodium bicarbonate. This work showed that the viscosity of a liquid and the amount of sodium bicarbonate both affect how much it increases in height when heated. There is likely an optimal viscosity-to-sodium bicarbonate ratio that allows for greatest rising of flour-water

Boltzmann-weighted energies of pinene-based hydroxy-peroxy radicals

Elizabeth Buchmiller, Glenn Mumford, Lauren Holden, Kathleen Gienger, Jaron Hansen, Ryan DaBell (Mentor)

Pinenes, a class of bicyclic organic compounds found in pine resin, are one of the most common biogenic organic emissions found in the atmosphere. Previous calculations suggest that pinenes may form hydroxyl-peroxy radicals by binding of hydroxyl radical across the double bound, followed by addition of oxygen. These radicals may contribute to a variety of atmospheric processes, such as the formation of tropospheric ozone or NOx. Recent work indicates multiple low-energy stereoisomers of the radical may be simultaneously present due to minimal energy differences between them. Current efforts are summarized in this work to calculate Boltzmann-weighted average molecular energies for pinene-based hydroxy-peroxy radicals. Further studies are planned to compile Boltzmann weighted average radical-water complex binding energies and equilibrium constants that will be used to assess the overall predicted behavior of these species.
**Effect of vitamin A on early intramuscular adipogenesis: a model for improving marbling in beef**

Schneider Jessie, April Gibson, Cooper Trost, Shaun Harris (Mentor)

Marbling is consistently identified as one of the top beef quality problems. Marbling, or intramuscular fat, is vital for the perceived flavor, juiciness, and tenderness in beef. While intramuscular fat in beef can be improved through genetic selection, prenatal and postnatal factors have profound impact on intramuscular fat development. Vitamin A deficiencies in cattle during late pregnancy and early lactation are not uncommon. While the effect of vitamin A or retinoic acid (RA) on late intramuscular adipogenesis and lipid accumulation has been well characterized, its effect on early adipogenic differentiation has not been characterized in beef cattle. The objective of this study was to evaluate the effect of vitamin A on early adipogenesis. Stromal vascular (SV) cells were obtained from Angus muscle, which were sorted based on their expression of platelet derived growth factor receptor (PDGFR)α. These cells were then exposed to four different treatments, with or without RA and with or without adipogenic media. Cells treated with adipogenic media in addition to RA had the greatest proliferation rate (P < 0.05), while there were no differences among other treatments. mRNA expression of peroxisome proliferator-activated receptor (PPAR)γ tended to be higher for both treatments containing RA after 2 d of treatment (P < 0.1), while treatment with both adipogenic media and RA enhanced Zfp423 mRNA expression (P < 0.05). After 6 d of treatment, Zfp423 expression was the greatest when treated with both adipogenic media and RA (P < 0.05). Our results suggest that RA has a stimulatory effect on Zfp423 expression and early adipogenic differentiation of cattle SV cells. These data imply that supplementation of vitamin A to pregnant cattle, especially during late gestation and early lactation, may be an effective method to enhance intramuscular adipogenesis and marbling in beef cattle.

**Estimation of Hydrogen Gas Concentration in Aqueous Solutions via Oxidation-Reduction Potential Measurements as a Function of pH**

Tyler LeBaron, David Collins (Mentor)

Hydrogen-rich water provides significant therapeutic effects for a number of disease models and has the potential to be used as a medical gas for the prevention and treatment of disease. However, the relatively low solubility of hydrogen gas (0.8 mM), coupled with the rapidity of hydrogen bubble coalescence and its subsequent effervescence decreases the lifespan of this therapeutic water. As the concentration of H2 in solution decreases so also does the therapeutic potential. Moreover, it is difficult to determine if the H2 concentration in water is high enough to exert therapeutic effects. This work attempts to estimate the H2 concentration in aqueous solutions. A standard plot was prepared by bubbling H2 into water at varying pHs (2-13) and comparing the measured oxidation-reduction potential (ORP) of each solution to the predicted values calculated with the Nernst equation. The ORP decreased with increasing pH in a linear fashion; however, the measured ORP was significantly less than the predicted values, suggesting potential supersaturation. Estimation of H2 in this manner provides a quick way to determine if the H2 concentration in the water is high enough to exert its therapeutic effects.
Neurogenesis in Crayfish

Jennifer Cutler, Courtney Albert, Hannah Peacock, Elliot Weideman, Ben Clark, Holden Higginbotham (Mentor), Holden Higginbotham (Mentor)

Neurogenesis, the birth of new neurons, was believed to only occur in developing brains. In the 1960s, adult neurogenesis was discovered but not observed in adult humans until the early 90s. Neurogenesis occurring throughout life could provide the ability to form new memories and gain new skills. There are also many pathological implications, such as Parkinson’s and Alzheimer’s disease. Individuals with these types of diseases suffer from neuronal loss which causes overall brain function to decrease. Neurogenesis may be able to slow down this deterioration process. Our proposed research is to test whether neurogenesis will occur in crayfish as a result of changing various factors, including diet and the environment. We hypothesize that an enriched environment and a healthy diet will increase neurogenesis. To test this hypothesis, a few experimental conditions were set up (enriched environment, specific diet, and spacious tank size). After two weeks in the experimental condition, crayfish brains will be processed using immunohistochemistry and will then be imaged with a confocal microscope.

Simultaneous chromatography and electrophoresis: Characterizing the Electric Field

Paul Powell, Jacob Parkman, Kei Furukawa, David Collins (Mentor)

Simultaneous chromatography and electrophoresis has allowed for improved planar separations of complex mixtures. Separations of vitamins, amino acids and dyes have been demonstrated producing repeatable results. However, streaking and unexpected motion of certain analytes have inspired efforts to further improve separation conditions. There is convincing evidence that the induced electric field is not uniform across the TLC plate. It is assumed that the electric field non-uniformity is static due to repeatable results. However, the electric field’s strength and effect on analyte mobility is difficult to characterize under these conditions. Recent experiments have focused on new plate design and adjustment of experimental parameters to maintain the electric field uniform across the TLC plate.

Simultaneous Chromatography and Electrophoresis: Comparison of Copper and Platinum Electrodes

Justin McKell, Tyrel Murphy, David Collins (Mentor)

Simultaneous electrophoresis and chromatography (SCE) is a novel two-dimensional separation technique that allows for concurrent, orthogonal chromatographic and electrophoretic separations. Effective peak capacity is improved in comparison to one-dimensional chromatographic separations, with no increase to analysis time. Separations of dyes, amino acids, and vitamins have been previously demonstrated employing copper electrodes. However, copper electrodes potentially undergo oxidation at the anode producing undesirable products, which are apparent as blue streaks and large dark regions under ultraviolet light. In an attempt to eliminate these effects, platinum electrodes were investigated. A design change to the SCE separation apparatus was required to accommodate the smaller platinum electrodes. Comparisons of SCE separations employing copper and platinum electrodes were made. Separations with platinum electrodes showed reduced oxidation effects with no significant change to compound retardation factors or apparent mobilities.
The Role of Primary Cilia in Directing Cell Migration

Joseph Knight, Craig Jarvis, Hans Olaveson, Robert Cox, Meredith Dickson, Cece Elam, Leanda Akuoko, Emily Peterson, Holden Higginbotham (Mentor)

Primary cilia are also known as “sensory cellular antennae”. Just as antennae act as electromagnetic signal sensors, the primary cilia act as chemo-sensors, mechano-sensors, and thermo-sensors that communicate extracellular signals into intracellular responses. Since primary cilia are found on nearly every type of cell in humans, their dysfunction causes widespread problems. Disruptions of primary cilia function (ciliopathies) cause problems ranging from the formation of cysts to infertility to mental retardation. It has recently been shown that primary cilia play a vital role in neuron migration, a key process in the formation of the cerebral cortex. It is thought that during brain development, the primary cilia of migrating neurons are thought to sense guidance cues sent from other areas in the brain. Disruption in this process because of cilia defects may underlie the mental retardation observed in people with ciliopathies. The purpose of our study is to further investigate the role and function of the primary cilia in neuronal cell migration. As a proxy for migrating neurons, we will study cilia function during cell migration using a cell culture model of fibroblast wound healing and real-time fluorescent microscopy. We hope these studies will give additional insight into the role cilia play in cell migration and advance our understanding of how these diseases of cilia dysfunction might be treated.
**CYP1 A1 and B1 Location and Activity in the Mink Uterus**

Dallin Sumpter, Matthew Morgan, Jason Hunt (Mentor)

The Cytochrome p450 (CYP) family of enzymes play an important role in regulating the implantation of the blastocyst in the uterus. They metabolize estrogen into Catechol estrogens—an important signal in a cascade of events that build up glycogen stores within the uterus. These stores could be an important food source for sustaining life in the Blastocyst during diapause. To understand the function of the CYP1 enzymes, the location of gene expression was examined. In situ RNA hybridization was used to find the location of the CYP1 mRNA transcripts. This technique uses DIG-labeled riboprobes to hybridize with the mRNA present in the cell. When treated with anti-DIG antibody and a chromogen substrate, dark staining occurs in the locations where the probe hybridizes. Mink uterine tissue was sampled for the presence of CYP1A1 and CYP1B1 proteins. These results, coupled with quantitative PCR results showed that the CYP transcripts were indeed present in the uterus, and the location of these transcripts was specific to uterine epithelial tissue. This evidence supports the idea that the CYP enzymes are converting estrogen to catechol estrogens in the epithelial tissue, triggering glycogen stores to be built up within the tissue.

**Adenovirus Delivered Gene Therapy for Ovarian Cancer Using the HE4 Promoter to Drive Expression of HSV1-TK**

Kiara Vaden, John Griffith (Mentor), Jennifer Rawlinson (Mentor), Steven Christensen (Mentor)

Ovarian cancer persists as the deadliest of the gynecologic cancers. Despite advances made in the biomedical field, no improvement of mortality rates have been seen for more than 40 years due to difficulty in detection of early stage ovarian cancer and few treatment options. Our research goal is to develop a gene therapy that effectively causes ovarian cancer cell death with minimal immune response or damage to normal cells thus potentially improving treatment options and increasing survival rates. We aim to achieve this by using an adenovirus to successfully infect and transfer our gene therapy to ovarian cancer cells. This gene therapy involves the use of an ovarian cancer specific promoter used to drive expression of a suicide gene. The Human Epididymis Protein 4 (HE4) is over-expressed in ovarian cancer cells, and is currently used as a biomarker for early detection of ovarian cancer in the clinic. The promoter region of HE4 has been shown to be transcriptionally active, yet maintains low activity in normal tissue. It has recently demonstrated great potential to drive high gene expression in a tissue-specific manner. We have successfully cloned the HE4 promoter followed by the well-known suicide gene Herpes Simplex Virus 1 Thymidine Kinase (HSV1-TK) into a plasmid vector, and are currently working to transfer that construct into an adenovirus. Cells expressing the HSV1-TK enzyme have the ability to phosphorylate the drug Ganciclovir (GCV), which is then incorporated into elongating DNA chains and causes premature cell death. Efficient adenoviral infection should result in sufficient HSV1-TK expression, driven by the HE4 promoter, to sensitize ovarian cancer cells to GCV and cause cell death.
The location and role of glucose transporters in blastocyst implantation.

Alex Hallam, Craig Steward, Jason Hunt (Mentor)

Histotroph is a uterine secretion necessary for blastocyst development and glycogen is a major component of histotroph. Energy needs in mammals are adapted to glucose as the primary source of energy, which is broken down and released from the carbohydrate polymer glycogen. Glucose (GLUT) transporters are essential and vital in the transport of glucose across cellular membranes. Glucose is also an essential nutrient for embryo survival and implantation in mink. Therefore, we hypothesized that adequate glucose transport from the uterus to the lumen is imperative in the process of blastocyst implantation. We have recently showed that expression of the glucose transporter (GLUT 1) was increased according to qPCR data. Although evidences were present for the up regulation of GLUT 1 there lacked protein evidence and location in uterine tissue. To show protein existence and localization immuno histochemistry (IHC) techniques have been employed to address the issue of where and if the GLUT transporters are present. For qPCR, uterine tissue samples from time course experiments. Uterus samples were taken proestrus, estrus, and pregnancy. RNA was extracted and gene expression was analyzed. For IHC uterine samples were treated with estrogen then sectioned. The sectioned tissue was then labeled with GLUT1 antibodies. We found that the GLUT1 transporter was located on the lumen of the uterus. We found that estrogen increases the number of GLUT in an effort to export glucose from the uterus to form histotroph to increase the viability of the developing blastocyst.

Exploring the role of chlorogenic acid in the attenuation of reactive astrogliosis

Jacob Thatcher, Holden Higginbotham (Mentor)

Worldwide, stroke is the second leading cause of death, claiming a life every six seconds. Stroke is a cerebral ischemic or hemorrhagic emergency due to the disturbance of blood supply to the brain, which ultimately results in neuronal damage or death. One response to dead or damaged neural tissue following stroke is the activation of neuroglial cells, which are support cells that help maintain a homeostatic environment (comprised of astrocytes, microglia and oligodendrocytes). Activated microglia respond to damaged or ischemic tissue by secreting pro-inflammatory cytokines. Later, activated astrocytes will contribute to the formation of a glial scar. Although this process (termed gliosis) plays a crucial role in the healing of the damaged tissue, there are also some deleterious side effects associated with it that may complicate recovery for stroke victims. Therefore, one therapeutic approach to stroke is to investigate ways that limit the extent of gliosis by modulating the activation of neuroglia. One approach to limit gliosis is to introduce into the diet factors that might reduce the activation of neuroglia. In fact, as part of a thirteen-year study, the American Heart Association showed that consumption of four cups of green tea or one cup of coffee per day decreased the risk of stroke by 20%. Chlorogenic acid (CGA) is a major component of coffee, green tea and many other commonly consumed foods and has recently been shown to prevent the activation of cultured microglia after exposure to lipopolysaccharide (LPS), a gram-negative bacteria that can activate microglia. A similar study has been conducted with caffeine, suggesting that some dietary compounds might be able to modulate the extent of neuroglial activation and gliosis. Although these studies analyzed the effects of CGA and caffeine on microglia activation, no studies to date have addressed whether these same compounds affect the activation of astrocytes, another major player in gliosis. Our project shows that exposure of astrocytes to CGA can have a protective effect by reducing the activation of cultured astrocytes that have been exposed to ischemic conditions such as stroke.
Comparison of bacteriophage lethality on Ampicillin resistant Eshera Coli vs. stock Eschera Coli

Ryan Smith, Tyler Allen, Holden Higginbotham (Mentor)

Antibiotic resistance in the U.S. is a growing problem, with 880,000 Methicillin-resistant S. Aureas infections reported annually and 20,000-40,000 deaths reported from these infections per year. One potential therapeutic option that could treat infections with antibiotic resistant bacteria is bacteriophage therapy, or the use of viruses that are pathogenic to bacteria applied topically as well as internally. Theoretically bacteriophages would infect and lyse antibiotic resistant bacteria in the same way they replicate and lyse bacteria without antibiotic resistance. However, little is known about the effectiveness of phage therapy in destroying antibiotic-resistant bacteria. Our research question is: is there is any difference in the lethality of lambda phage in an antibiotic-resistant E. Coli strain versus a non-resistant strain? To address this, we will use stock E. Coli and ampicillin resistant E. Coli cultures and infect them with Lambda phage, an E. Coli-specific bacteriophage. We will then measure lethality with a zone of inhibition test. We predict that the zone of inhibition will not show a statistically significant difference in a resistant culture versus a non-resistant culture, and that Lambda phage is equally lethal to antibiotic resistant E. Coli and non-resistant E. Coli.

Sound Pollution

CallyAnn Hamilton, Brooke McKenna (Mentor)

We live in a society that is saturated with noise. Unfortunately, sound pollution is more than just an annoyance or inconvenience: it can actually be harmful to your health.

Aryl Hydrocarbon Receptor Complex

Matthew Widdison, Jason Hunt (Mentor)

The process of blastocyst survival and implantation is a complex and highly regulated cascade of events. Successful implantation requires communication between the cells of the uterus and the embryo. This study suggests that a key step in this process appears to be a class of Aryl Hydrocarbon Receptors. These receptors, along with other factors regulate the expression of the Cytochrome p-450 (CYP) genes (CYP1A1, CYP1A2/1B1) in the uterus. Preliminary studies suggest these cytochrome genes may assist in the coordination of blastocyst implantation. Aryl Hydrocarbon Receptors (AhR) are basic helix-loop-helix (bHLH) heterodimeric ligand activated transcription factors found within the cell. Upon activation of AhRs the receptor enters the nucleus, associates with DNA, and acts as a transcription factor. The aim of this study was to find the relative location and activity of the AhR complex by using AhR specific antigens and immunohistochemistry procedures. Results suggest AhRs are predominantly localized in luminal uterus cells over glandular cells. This is seen by the heavy staining in the lumen while only light staining is found within the glandular cells. These findings suggest to us that although luminal and glandular uterine cells are categorized as epithelial cells, there appear to be different and distinct actions of the two cell types. Further research is in progress to determine if the distinct location of the AhR complex is also associated with a distinct expression pattern of CYP enzymes.
Phototrophic E. coli via Heterologous Expression of Proteorhodopsin

Skyler Hebdon, Holden Higginbotham (Mentor), Shane Ruebush (Mentor)

Proteorhodopsin (PR) is a light activated proton pump which provides an energy source for oceanic bacteria, such as Vibrio harveyi. Recombinant PR in a diazotroph, such as Azotobacter vinelandii, could provide an excess of energy which would potentially result in higher rates of nitrogen fixation, thus creating a light-dependent, nitrogen fixing bacterial factory. This work explores the use of PR as a recombinant energy source in a model organism, E. coli. The PR gene was isolated from the genomic DNA of Vibrio harveyi and expressed in competent E. coli. To test recombinant PR as a source of energy, PR+ E. coli were incubated in the presence of azide, a respiratory poison that blocks E. coli’s normal energy sources. Loss of motility of E. coli confirms the effect of the azide poison. A return of motility in the presence of light and azide confirms the phototrophic capabilities of recombinant proteorhodopsin.
Does an Economic Downturn Affect the use of Credit Cards in America?

Jordan Kendall, Judith Ayala, Jessie Anderson, Mark Minarik, David Barrus (Mentor)

Credit Cards have been around since the 1920’s. They first were introduced for people to use on fuel purchases, but have since become an easy form of payment for all goods compared to using cash. Since there has been a large increase in usage of credit cards in recent years, many things have been written about why American’s have shifted from cash and to plastic. For example, the article The Swipe and Spend Economy talks about credit cards and their increasing popularity. The idea of just swiping a card and dealing with the cost later has become a widespread mentality. In the beginning, consumers were required to pay off their credit card balance at the end of each month. This practice has now changed to become more of a convenience to the consumer. Credit card companies now do not require a full payment at the end of every month, but only partial payments over a certain period of time. Not only does this allow for the owner of the credit card to pay off the balance over a longer period of time, but the interest tied to the outstanding balance allows credit card companies to make a higher profit. In 2009, a survey conducted by the magazine Newsday shows us regardless of social class, how reliable Americans’ are to their credit cards today. With technology and fashion always changing, people naturally want to have the newest and best of everything. Even during a recession when most people are probably earning less, they still continue to use their credit cards to buy the newest and best while also using them for every day purchases like food and gas (Plummer, 1971). Because of a credit cards’ new convenient “buy now pay later” philosophy, they have become a lifeline for consumers rich or poor. With the popularity of credit cards today, it has led to this research if there really is a difference between how Americans’ use their credit cards depending on what type of economy they are living in. The alternative hypothesis is that credit card convenience has become so much a part of consumers’ everyday life, that regardless of what’s going on in the economy around them, whether it’s good or bad, they still would use them the same way.

EB-5: Boosting America’s Economy

Jacob Tolman, Jeremy Lamoreaux (Mentor)

The employment-based visas have five different categories. The fifth, or EB-5, visa option represents a way for foreigners to come to the United States as investors, bringing their capital and expertise to American businesses and industries. These investors and their families are those who seek stability in their lives that is not currently found in their home country due to political or economic issues, while simultaneously gaining access to the prestigious institutions of higher education in the United States. This research represents hundreds of hours of research, interviews with program pioneers and professionals, going in to the brief history of the program, the job creation it has brought about, the businesses it has positively affected, and the potential future that it holds.
Price in the BYU-Idaho Housing Market: An Econometric Analysis

Bryan Faulk, Jimmy Ayama, Brandon Waters, David Barrus (Mentor)

Every semester thousands of BYU-Idaho students browse the catalog of housing options and decide where to live. Will it be in the new, spacious, expensive complex, or the older, cheaper complex located a mile from campus? At the same time, dozens of apartment complexes compete for tenants by striving to supply comfortable living arrangements at a reasonable price, but what qualities and amenities do students care about most? This study aims to discover what factors students look for when making housing decisions by determining what influences price in the BYU-Idaho single student housing market. One need not look far to see the rapid expansion of the BYU-Idaho housing market. Complexes appear to sprout from the ground every semester in anticipation of expected enrollment increases. This study can help those new developments understand the market they are entering and price their rooms accurately. It can also aid older complexes looking to increase revenue in the long run. By understanding how much each variable affects the price, a firm can make the changes that will matter most. The result will be higher revenues for the firm and a more pleasurable living experience for the consumer. Additionally, it will offer tenants the ability to determine whether their current landlords overcharge or undercharge compared to the rest of the market and may help them make future living decisions. Data for ten of the eleven variables used in this model come from the publicly available information offered on the BYU-Idaho website. The other, distance from campus, was measured for each firm individually using Google maps. An ordinary least squares regression was then performed on the data using statistics software; this regression created a model which is currently under evaluation by our team of researchers. Though we are still scrutinizing the model, our analysis has already produced interesting results. Why do women pay $50 more than men for an apartment of equal quality? And why does an apartment’s base price increase by $0.66 for every dollar increase in an application fee? These questions, and more, will be discussed in our presentation.

The Potato Pale Cyst Nematode: Robbing Idaho Economically

Mandy Kilburn, Stephen McGary (Mentor)

Idaho potatoes are the State’s largest valued agricultural crop with annual revenues close to $1 billion. Indeed, potatoes from Idaho are recognized around the world for quality and quantity. In 2006 it was discovered that a potato field in Bingham County was infested with the Potato Pale Cyst Nematode (PCN) a pest that attacks healthy potato plants, causing severe reduction in yields, ranging from 50-70%. The discovery of the PCN in Idaho has caused severe negative economic impacts not just in the potato industry, but to the State overall. Since the discovery of the PCN, approximately 2,000 acres of potato ground has been removed from potato cultivation, leading to an immediate reduction in economic returns to the industry and the State overall. In 2012 the direct loss was estimated to be $4.4 million. In addition it is estimated that there are 171 fewer jobs, statewide with a value of $8.6 million in income that has been lost since 2006. Overall, the State GDP has decreased by $33.2 million while total tax revenues have been reduced by $1.2 million, most of the losses attributed in part to the PCN infestation. The PCN is a serious concern to Idaho’s economy and must be eradicated in order to maintain economic growth and a viable potato industry. This report is directed to industry participants and policy makers in providing information for the development of actions in controlling and eradicating the PCN.
What Causes U.S. Airline Fares to Fluctuate?

Jordan Welch, Amanda Rosier, Brynn Dalby, Christopher Coley, David Barrus (Mentor)

Airfares have fluctuated greatly over the past years. Comprehending how combined factors affect airfare prices has always been of interest to frequent travelers. This study used the Bureau of Transportation Statistics and Bloomberg Airline Industry Dashboard to collect data from 2003 to 2011 on airline information leading to possible airfare variation. The purpose is to identify consistent variables that cause airfare fluctuation within that time frame. Variables used within this theoretical model explain 83 percent of airfare fluctuation. The remaining 17 percent that explains airfare fluctuation cannot be pinpointed to specific variables that are included in this model.

Wheat Yield Forecasting

Brandon Hawkes, Parker Johnson, Justin Baker, David Barrus (Mentor)

For our project we wanted to understand if there was an ability to analyze weather data and predict wheat yields for both irrigated and non-irrigated spring wheat in Idaho. Initially we gathered data for a specific county in Idaho but the data did not have enough observations to be significant. We then changed our model to include weather data and wheat yields for all of Idaho. The model includes the precipitation and temperature of the months prior to planting (Oct – March), and the yield amounts of spring wheat. The model also included some of the input costs that would go into the planting and harvest of wheat to see if there was any effect on the overall yield. We estimated that due to the unpredictability of weather that we would be able to have many significant variables that a farmer would be able to use to help predict their future yield, and thus make managerial decisions that would affect farming operation profits.
Brigham Young University Idaho Student Movie Viewership In Comparison to National Averages

Chelsey Clark, Juliana Aguilar, Josh Shumway, Joanne Montoya, Melynda Myrvang, Christopher Hannan, Lane Williams (Mentor)

As a group we decided to focus on this topic for our research project because we all had a personal interest in movies. We are curious about what types of movies BYU-Idaho students watch and why they are watching these specific movies. At first we wanted to focus purely on the ratings of the movies but we found that we would get more out of our research if we just simply asked BYU-Idaho students what movies they watch. We discovered that if we included the rating, genre or actor preference, we would have too many variables that could potentially hinder our findings. We have decided that simplicity is key. With one simple question we will be able to retrieve a plethora of findings from our final analysis. Our interest in knowing what movies BYU-Idaho students watch stems from our love of movies. Being a part of this student body and living certain standards we are curious to know what types of movies our peers are viewing.

Does Color Code effect perception to facial expressions?

Lisa Welch, Mark Grow, Jessica Madsen, Lane Williams (Mentor)

The research project that is going to be displayed and explained are the results of a survey we have conducted with students here on campus. The Hartmans Color Code Test is a test that was developed to analyze our personalities. The test helps the person understand what motivates them, what career paths they may take etc. The test is based on four colors Red, Blue, White and Yellow. Our survey will ask these different color personalities to answer some simple questions about how they perceive facial expressions. Does a persons color personality effect their perception to facial expressions?

How does media affect men’s perception of how they should look or act?

Bridget Lundy, Brayden Christiansen, Kris Bennett, Brittney Long, Lane Williams (Mentor)

There is a plethora of articles that have insight on women and how media affects them and their image of how they should be. The information on men, however, is sparse. Articles that have been found express what was efficacious with the men and what inspires them to make changes. This includes how effective media was in their goal. There are articles that show how research was done to find answers similar to the meta question being focused on. The focus group conducted consisted of up to ten men at a time being shown images; opinions were expressed that we believe can be replicated. We will analyze the data collected and compare it to the research that has already been gathered by academic scholars. After analysis, illustrations of trends between men and how they feel the media influences them will be made.
**How does message headings effect survey participation?**

Alex Orme, Brandon Adawi, Andrea Mehner, Lane Williams (Mentor)

Meta question: How does message headings effect survey participation? To answer the Meta question, we are going to send out two different surveys to random samples using Qualtrics. The first survey will have an informal message heading of “Hey” and the second survey will be have a more formal message heading of, “Please participate in this brief survey.” The research questions will be discovered based on the questions in the surveys that will be sent out. Both surveys will have the same questions, just different headings. Our objective is to see which type of heading is most effective when it comes survey participation.

**The Mobile of Web Development**

Ronald Consoliver, Kent Jackson (Mentor), Lee Barney (Mentor), Kory Godfrey (Mentor)

The project goal is to develop a web application that would eventually be able to give meal recommendations for a user. Currently, the focus of the project has been on the design of the user interface using HTML, CSS, JavaScript, and JQUERY. The audience that is being targeted for the application is young married couples, which has turned the project to be developed primarily for tablets. In order to achieve this, I have sketched some of the pages, looked for input on possible changes, and started building prototypes for others to view. The project itself is important because it demonstrates some of the uses of web technology presented in the mobile environment as well as the design process involved. Since this is a new and growing area of technology, it can be enlightening for others to see a little bit of the process that goes on for development.

**University Facebook Page**

Casey Ross, Radhames Gomez, Kristin Smith, Julie Westergard, Lane Williams (Mentor)

BYU-Idaho has an official Facebook page where information about devotional and other things is posted. This is a study on the effectiveness and usage of BYU-Idaho’s Facebook page. The study includes opinions of students and conclusions about what would make communication between students and the university more effective. A focus group was conducted with students so they could share ideas and give their opinion on the Facebook page. The students gave suggestions of what they would like to see from the university through Facebook. This study is a valuable contribution because social media can be a tool for the university to better connect with students on campus and off.

**(Adam Quarterly) DTK**

Zachary Mercado, Nicole Kuiken, Jeff Slagle (Mentor)

Rexburg, Idaho, BYU-Idaho, and its surroundings have inspired or facilitated inspiration for people living in the area to write and create different forms of art. Even though BYU-Idaho gives students the opportunity to submit to a literary journal sponsored by the school, there’s an even more expanded view from the students and the surrounding community. This view is often not seen. Having been inspired by literary journals and magazines, I decided to invite those I’ve met in this area to independently publish their works of writing and art in a quarterly published, independent electronic magazine/journal called Adam Quarterly. The magazine will be published as an e-book/magazine, as well as have a website to host the content online in order to expose the writers and authors that the magazine personally endorses. The design, format, style and idea will be presented.
Buoyancy and Draft of Touring Kayaks

Brett Wilson, Brian Pyper (Mentor)

Touring kayaks are often used for overnight camping and multiday excursions. On a multiday excursion the small kayak needs to be able to hold a passenger and all of his or her gear. Knowing the loading capacity and draft of your boat is important to its safety and performance. When designing a new kayak the buoyancy and draft need to be calculated and tested. This project includes a new kayak design with the predicted buoyancy and draft compared with the tested buoyancy and draft of a scale model.
**AC to DC Power Conversion**

Lucas Lehman, Phlatt McLean, Richard Grimmett (Mentor)

We would like to demonstrate the conversion of an alternating electrical current to a direct current through the use of an electric circuit which, when provided an AC signal of 120 VAC such as that found in common wall outlets as input, would output a DC signal in the range of 12 to 18 VDC. The functionality and potential applications of such a circuit would be described and demonstrated as a portion of the presentation, including the presence of schematic diagrams describing circuit design as well as the actual device.

**Bob: The Animatronic head**

Paul Rossi, Paul Mitchell, Kara Webb, Richard Grimmett (Mentor)

This project is an animatronic head that speaks to you. In order to achieve this objective, servos (motors) are used to create two axis rotational movement for the eyes and jaw movement. This project also incorporates sound output and computer interface to send responses to the skull.

**Cantenna Radar**

Derek Nelson, Tiago Rodrigues, Taylor Martin, Richard Grimmett (Mentor)

We will demonstrate how to use RF waves to create a radar. Using a MATLAB program, we will convert the reflected RF waves into data that will be able to show how far away an object is.

**Flying Autonomous Multicopter**

Andrew Baker, Rachel Wynder, Richard Grimmett (Mentor)

Our team will be designing and building an autonomous quadcopter that takes off and lands through GPS coordinates by a computer; instead of a remote control. We will be building with a multicopter build, structured after the x525 frame along with using an APM 2.5 control board. The area of performance requested will consist of strapping the quad with a rope, tied down to a cylinder block for safety. Then showing it successfully traveling from one point to the other. There are so many possibilities with working on this multicopter. We are excited to expand, push the limits and create something even better.

**Home Automation**

Von Hugo, Stuart Wilson, Shea Peacock, Benjamin Limb, Mike Galloway, Andy Griffin, Mark McCann, Adam Dean (Mentor)

The purpose of this project is automate several features of a home for the comfort and ease of the occupant. Initially a rocking chair and television have been set up to recognize when a user sits down. Then the chair commences rocking and the television is turned on automatically. Further, an application for the ipad or iphone has been developed to control additional home devices. The controllable devices include door locks, lights, and thermostat. The status of each device is monitored and displayed in the mobile application. This includes displaying to the user whether the lights are on or off, the door is locked or unlocked, and the current temperature of their home. Along with the status of each feature, control of each feature is accessible remotely and by location of the user. This allows for home automation and control of the locks, lights, and temperatures simply by proximity or by remote access through the internet.
Jarvis

Tiago Rodrigues, Rob Small, Richard Grimmett (Mentor)

The purpose of this project is to present a voice controlled house. The voice command will control the LEDs in the model house, which will represent the lights in a real house. The blinds will also be controlled by voice.

MowBot

Riley Nielson, Jacob Skousen, Jordan Nielsen, Daniel Bryner, Adam Dean (Mentor)

Introducing this years hottest mechatronics device: The MowBot! The MowBot is here to solve all your lawn mowing needs. Using an RC controller, the MowBot can be controlled from up to 25 feet away. Complete with blades that lift and lower, this little guy works hard so you don’t have to. In case the user isn’t paying attention, this MowBot can sense obstacles from 2 feet away and safely stop to avoid unwanted collision. The MowBot is a must have for all wish to spend more time relaxing and less time mowing.

Multi-Function Radar

Zack Sheffield, Phlatt McLean, Richard Grimmett (Mentor)

Radar that offers speed and range sensing with the aid of MATLAB.

Radar Apparatus

Lucas Lehman, Kara Webb, Richard Grimmett (Mentor)

We would like to present an electronic radar device with multiple functions including Doppler Vs. Time as well as Ranging Vs. Time capabilities. Circuit schematic diagrams as well as overall descriptions detailing how the device operates would be included. Demonstrations of the radar in operation would also compose a portion of the presentation.

Table Tennis Menace

Zack Sheffield, Bryce Perry, Richard Grimmett (Mentor)

Automated robotic arm capable of sensing and responding to incoming ping pong balls. Two color-sensing webcams, situated in a way that provides real-time, 3-dimensional positioning, allow a computer to calculate the trajectory of a ping pong ball and return a volley to its opponent. This technology can be extended to other applications such as assistance to disabled, dynamic object tracking, and other things that require real-time tracking of a specific object.

Using a Campfire to Charge a USB Device

Sean Nicolaysen, Shashi Sharma, Richard Grimmett (Mentor)

A pressure vessel, turbine, electrical windings and power rectifier designed to charge a USB device such as a cell phone or GPS unit using the heat of a campfire. Majority of outlined research includes turbine and winding interface and rectifier system that converts the turbine’s generated current from AC to 5V DC.
**War of the Currents**

Taylor Martin, Cody Marshall, Richard Grimmett (Mentor)

*We will explore the positives and negatives of AC and DC electricity as methods for power distribution. Key Principles investigated will be: complex power (real and imaginary computations), which current is best suited for each type of power generation, importance of transformers/3 phase power transmission, no phase matching for DC transmission lines We are also going to demonstrate how to convert from AC to DC and DC to AC using rectifiers and inverters.*
Advanced Medical: Ovarian Cyst Removal Tool
Rachel Jones, Nyssa Ramirez, Erik Lindstrom, Leon Van Sickle, Austin Kinghorn, Sean Walker, Alan Dutson (Mentor)

Product development was use to design and develop a device for removing ovarian cysts. The device will make the ovarian cyst removal procedure more conducive to outpatient surgery. It will do this by reducing the amount of anesthesia used for surgery and by reducing the time it takes to recover from said surgery. This device was also designed to reduce the patient’s time in surgery and to aid in the containment of possible cancer cells.

Gynolight
Kelsey Bernard, Brent Crowther, Dan Cutler, Nathan Keilbart, Cayd Brunson, Alan Dutson (Mentor)

The Gynolight is an exam light used in a medical office to examine patients. It is placed inside of the drawer for and exam table. The light is designed to pop up and turn on when the drawer is opened and close down and turn off when the drawer is closed. This project is meant to help doctors see parts of the patients they need to see while still keeping everything sanitary. This is made possible with the gynolight because it does not require adjustments therefore keeping the medical instruments, the table, and the patient sanitary and safe.

Safety device to enable persons with various disabilities to safely perform riveting operations
Jesse Holdaway, Tyler Seamons, Aaron Madsen, Jacob Hill, Alan Dutson (Mentor)

Development Workshop provides vocational training, paid employment, and placement services to many individuals with disabilities who are striving for greater independence. As individuals are taught new tasks and given new responsibilities, they experience a great joy in their newly found independence and abilities. However, there are many tasks that prove too dangerous and remain out of reach of these individuals. The goal of this project is to create an assistive, safety device which allows persons with various disabilities to perform riveting operations safely, without automating the process. The focus is to maintain the amount and difficulty of the work while creating an environment that prevents injury to the persons. This focus will enable more individuals to perform this task while still offering a challenging responsibility that will further increase their confidence and independence.

Snowmobile Redesign
Harold Bishop, Aaron Schellenberg (Mentor)

I redesigned the snowmobile to make it cheaper to produce, lighter, and easier to maneuver. The basic layout of the track, skis, and engine remain the same, but the manner in which these components are connected together and supported is drastically changed. The ideas for these designs which originated from snowmobiling experience started out as pencil sketches on paper, but were later made using Autodesk Inventor 2011. This CAD software demonstrated the need for additional design changes which will eventually result in the design of a functional vehicle. Although this snowmobile has not yet been manufactured, the CAD software has eliminated many design flaws which would not have shown up until the product was manufactured. The result is a cheaper and easier product to produce. Education is also a large part of this project. In the progression of the design knowledge gained in engineering courses continue to contribute to the overall objective.
**Spirit Aero Systems-Modified manufacturing processes**

Bryan Wright, Scott Holt, Mark Campbell, Stewart Boydston, Landon Lines, Alan Dutson (Mentor)

For our Mechanical Engineering Capstone class we have been sponsored by Spirit Aero Systems to create 3 working prototypes to help fix an error with their current manufacturing process. The process involves a track system that moves hinged doors that are currently getting stuck open. We have taken the process and created 3 optimal designs that are optimized to working conditions, cost, and ease of replacement.

**Team Tonitrus: An ASME competitive rocket launching project**

William Slade, Russell Daines (Mentor)

In June Team Tonitrus will travel to northern Utah to compete against other universities in a rocket launching contest. The rules of the contest is that our rocket needs to reach 10,000 feet, do so with a ten pound payload, and then return to the ground in good enough condition to be launched again. In order to receive special recognition at the competition, we have built our rocket entirely from scratch, without any standard parts or instructions. We have also created an outreach program that encourages kids in local schools to be excited about science and engineering. The rocket is mostly made out of high strength cardboard. It is eight feet tall, six inches wide, and weighs about thirty pounds. The motor is a polymer matrix containing Aluminum and Ammonium Perchlorate. Ammonium Perchlorate is a very dangerous oxidizer; it is so volatile that when it combusts with Aluminum the motor puts out 1500 pounds of thrust. It is dangerous enough to require an Explosives License from the federal government for the amount that we are using. Once the rocket reaches 10,000 feet, an on board altimeter shuts off the motor and launches the drag chute out of the nosecone. The drag chute is cross shaped and only measures three feet across. This causes the rocket to fall in a fast but controlled manner until it falls most of the way back to the ground. At that point the rocket splits in two and releases the main parachute, which is circular in design and much larger. The main chute slows the rocket down to a safe landing speed. Once the rocket is on the ground, the parachutes are stuffed back inside of the rocket, the nosecone and two body halves are reattached, and a new motor can be installed for immediate relaunching.

**The FIT Phone Case (Digital/Physical utility)**

Nial Spencer, Austin Lovell, Dan Ard, Wade Huntsman (Mentor)

My project and presentation will be based off a product that has not yet been seen in the current market place. I hope to show the need and the convenience of my product and how beneficial it will be to have the advantages of both a digital and physical utilities in your front pocket. My product takes the basic idea of a mobile phone case and adds additional features to it, which in return makes it more of a useful tool rather then just protection for your phone. Digital utility (Smart Phone)+ Physical utility (screw driver, knife, scissors, pen, tweezers, etc.)= A Truly Unique Tool!
The Spoodle
Riley Nielson, Brady Wilcox, Joe Maestas, Daniel Bryner, Tyler Baker, Alan Dutson (Mentor)

Our project is a device that cuts an adhesive sheet into thin strips, or noodles, for the company Spirit AeroSystems. Spirit AeroSystems builds the nose cone fuselage for the Boeing 787. The adhesive noodles attach to the ribs on the skin of the fuselage to provide support. The noodle splitter uses 42 spinning blades to quickly slice through the adhesive.
Automated Paintball Security

Brandon Nelson, Shea Peacock, Chris Blanchard, Troy Seletos, Greg Roach (Mentor)

Pests and Intruders are problems for many people in the world. In order to present a solution to this problem, the team has designed a motion detecting paintball gun. This design calls for a paintball gun mounted to a tripod, which will be fired by a servo motor, after an IR motion detector signals it. Most of the components for this design were purchased by outside manufacturers, the tripod mount was made by the design team. This design is tailored to specific customer needs, which were discovered after weeks of research.

Automatic Toilet Paper Dispenser

Alyssa McCarter, Taylor Pogue, Brad Plummer, Enzo Ramirez, Greg Roach (Mentor)

This project involves reducing germ spread on public bathroom toilet paper and to control the amount of unused toilet paper by designing a fully functional automatic toilet paper dispenser. The automatic toilet paper dispenser targets high flow traffic bathrooms, where it aims to increase sanitation by easily dispensing toilet paper rather than the conventional manual method. In order to develop this product, key processes such as surveying, benchmarking, completing a failure mode and effect analysis, and prototyping were implemented. The final product resulted in a high volume industrial toilet paper that functioned both automatically and manually using an ultrasonic sonar proximity sensor, a high torque 60 rpm DC motor, and a programmed Arduino Uno board all encased in a Georgia Pacific toilet paper dispenser housing. Through creating a functioning automatic toilet paper dispenser, this decreased human contact with the toilet paper and resulted in a more accommodating, enjoyable, and sanitary experience for customers using public toilet paper.

Custom Fit Headphones

Justin Deitrick, Trenton Evans, Tyson Goddard, Joseph Gosar, Greg Roach (Mentor)

Custom fit headphones are out of reach for the average person due to their high prices. Our team wants to come up with a cheap alternative to high priced custom headphones. Since no two ears are the same achieving a perfect fit is unlikely to accrue by off the shelf headphones. To achieve this perfect fit silicone will be molded into the ear and a headphone place into the silicone. After drying a reinforcing shell will be added for looks and durability. This cheap alternative for custom headphones will be great for the budget conscious.

Game Cart

Darren Saunders, Dave Clark, Shaun Rorrison, Justin Dastrup, Greg Roach (Mentor)

The Dead Sled is designed and built to be durable and accommodate a wide variety of users. It will mainly be used to assist hunters in retrieving big game animals that have been harvested. Some of the unique features of the Dead Sled include its one wheeled design, braking system, loading arrangement, and handle adjustability to accommodate different sized users. The driving force behind these features was to reduce user fatigue and improve the big game hunting experience. Market research and lead user input directed these efforts. The critical dimensions of the cart were also derived from user needs and the potential operating environments of the Dead Sled. These environments were simulated using finite element analysis to ensure durability and reliable operation. Included with this report are detailed drawings and assembly instructions as well as long term financial projections.
Soil Removing and Grinding Device

Von Hugo, Steve Eliason, Bryce Merrill, Woody Layne, Greg Roach (Mentor)

To decrease the time required during the soil compaction tests, two tools have been made for the removal of soil samples from the test cylinder and for the thorough grinding of the soil for subsequent iterations of soil compaction tests. A test cylinder full of compacted dirt is attached to the rotating part of the first tool: the table-mount soil-remover. The cylinder is rotated downward onto a blade which scrapes layers of the soil out to be measured for moisture content. Remaining soil is then ground to sufficient degree of fineness using the second tool: the hand-held dirt grinder. Once the soil is sufficiently ground, iterations of the soil compaction tests commence.

Solar Sensor Tester

Fielding Sarager, Andrew Jarvis, Brian Garcia, Jacob Skousen, Greg Roach (Mentor)

A contraption was made in order to test the accuracy of different solar sensors that are used in vehicles to determine the strength of the solar rays that in turn stabilize the climate control system in the vehicle. The contraption consists of a base, two cross rods, and a top plate where the sensors are placed. There are two servos placed on each of the rods that can move the horizontal rod 90 degrees and the vertical rod 360 degrees. This tester will simulate the sun at every possible angle by moving the platform. Data will then be transferred to a computer to determine how accurate each sensor read the sun.

Speed Loader

Nick Cummock, Dustin Whittaker, Ben Edwards, Kyle Johnson, Greg Roach (Mentor)

There are many speed loader designs for revolvers. To increase the usability and universality and decrease the number of motions and required time to use speed loaders, team Lightning Loader has designed a magnet powered speed loader for .357 revolvers. This speed loader is meant to allow the user to use only one hand to hold the speed loader; the user simply presses the speed loader against the revolver cylinder after which magnets force the ammunition into the cylinder. The device is quick, clean, and easy to use.

Top Shot

Joseph Cardwell, Jesse Cottam, Adam Valentine, Mauro Artica, Levi Lynn, Greg Roach (Mentor)

The Project Team Top Shot is designing and assembling an adjustable gun rest to be used by the general public. After determining significant customer needs and appropriate specifications for this gun rest, a concept to satisfy those needs and specifications was selected. This concept chosen is that of an adjustable bipod with the ability to freely swivel and lock in position. A universal mounting apparatus was also included to connect the bipod to a standard size swivel stud included on most rifle stocks. This bipod is also designed to fold up quickly and compactly without tools to allow for easy transport.
Wing It

Monty Anderson, Garn Brady, Brandon Self, Jake Anderson, Greg Roach (Mentor)

A female molding technique was developed and used to produce hollow wings fit for use in Dynamic Soaring. The molds were required to have dimensional stability of wing foil design and plan form. The molding technique was also required to include the process of loading wing material into the mold, how to vacuum bag, and how to connect wing halves together. The project was successful and proved to be a versatile way to produce hollow wings.
**Behind the Red Curtain**

Rachel Jones, Scott Samuelson (Mentor)

This story is a short piece of creative nonfiction. It examines the tensions that arise between the living and the dead. It is a reflection of my experiences on the stage, and how they have paralleled the relationship I developed with my older sister. It addresses the frustrations that come with learning to live in the shadow of another person, and the struggles that come with leaving it.

**Drawing Fire**

Jenalyn Cloward, Josh Allen (Mentor)

"Drawing Fire" is a short story about Elix, a seventeen year-old boy living in a world where magic is a way of life and where all nobles—and some of the richer middle-class—attend the Elemental Academy, an elite school that teaches Elemental magic. Elix is in his fifth and last year of the Academy, which is the year students learn fire magic. Elix is behind in his studies and is having difficulties conjuring fire, and must learn how to do it in his own way. This short story is intended to be an excerpt of a larger story about Elix and his twin sister, Elin. Even as they are learning Elemental magic, a secret society is on the rise that claims to have the secrets to a new, better magic, one that can change one element into another. This new magic threatens the idea of stability and balance that is the central philosophy of Elemental magic, thus threatening the entire social structure of the country. The main idea is the story of Elix and Elin as they rise to the challenge to find a way to face this threat to their way of life.

**In a box of crayons, people, places, things...**

Arthur Thomas Lee, Matt Babcock (Mentor)

A collection of poems diverse in style, structure, and message—from identity, color, and sin to freedom, redemption, and childhood. I have long since loved to write fiction, long and short. I took an opportunity to try and capture that raw, basic element that binds us all together, no matter how different we are. "Poetry is a vine-ripened grape sweetened with frost; aged cheese, cured in stony room, made sharp by time; a knife through chocolate cake, like a body cutting black ocean waves. Each poem a pebble, collectively turning the river’s course. It is the stone skipping over glass, and clear distorted reflection. Let he who is without poetry cast the first. It is the rock in David’s sling, the hole in Goliath’s head. In the bleating heart, it is blood the color of grape juice turned wine, the sacrament by which we remember."

**Initiatory**

Christopher Cunningham, Matt Babcock (Mentor)

This is a creative writing work. The protagonist dealing with feelings of inadequacy within his nascent marriage. While attending the temple he discovers the unity of imperfection within the church, allowing his marriage to transform from a primarily romantic construction to a social/spiritual construction. The story examines topics such as gender roles, the LDS marriage culture, the spiritual function of temple attendance, romance, and imperfection. I plan to write it in the first person point of view of the protagonist in the recent past tense. I plan to set the story in contemporary Rexburg.
**Pear Girl**

Anna May, Jim Richards (Mentor)

*Pear Girl* is a retelling of the Italian folktale "The Little Girl Sold With The Pears," staying true to the theme and style of the original tale. In it, a kitchen maid named Mabel but called Perina is given a task by the King: reclaim the evil Witch’s stolen treasure. In order to break a curse on the man she loves, Mabel must face the unknown and great danger, with only a fairy's advice and the power of love to aid her.

**It's Life**

Kelsey McMurtrey, Matt Babcock (Mentor)

As I am nearing graduation, I can’t help but reflect back on my education as an English major here at BYU-Idaho. I have struggled to find a voice of my own as a creative writer, but my professors have really propelled me to keep digging until I find it. At times, it has solely been their encouragement that has driven me to keep writing, and for that I am grateful. Their encouragement, along with my persistence in exploring the field of creative writing, has lead me to sincerely appreciate poetry in particular, and to find my voice as a young poet. The poem “It’s Life” is an exploration of what poetry means to me, and how I view poetry as a means of connecting the beauty of everyday life to written language. Poetry isn’t about losing the reader in obscure language or intangible meaning. Instead, I believe that it is about connecting with the reader through small bits of truth and real experience. “It’s Life” connects small but meaningful moments, stringing them together to define what poetry means to me. The simplest things in life can bring us the greatest joy, and this happiness is what I have tried to capture and convey in this poem.

**Remnant Rays**

Bobbie Gross, Kip Hartvigsen (Mentor)

*Remnant Rays* is a collection of five poems that center around loss, grief, and fading memories. "The Princess and the Sky" explores a beach through the eyes of a child, setting the tone for vivid memories that adults can never keep. "Threadbare Notes" describes the feeling of memories fading through the extended metaphor of a fading dream and is primarily written in iambic heptameter. "Blue Eyes Crying for Lorraine" deals the most directly with death and loss and was written in tribute to my grandmother who passed away last June. It is from the perspective of my grandfather and uses Southern gospel and old country music lyrics in combination with vivid imagery to express the loss that we feel when memories begin to fade. "Death of a Clock" and "Dandelion" show the death of ordinary objects, ending in peaceful feelings that contrast with the despair of "Blue Eyes Crying for Lorraine." Most of the poems are written in a conversational tone, and all are experienced best through being read aloud.

**The Fall of Noldur: Lessons learned from writing a myth-interpretive novel.**

Robert Fletcher, Brooke McKenna (Mentor)

This is a full-length novel, unpublished, written based on the Scandinavian myths of Ragnarok and the mostly dead religion that believed in it. It will cover parallels to Christianity and insights into the mindset of the ancient Norse based on my study and attempted re-interpretation of their myths.
Two Cigarettes

Eric McLean, Matthew Babcock (Mentor)

A young girl named Robin steals cigarettes from her dad to smoke behind the barn with her brother and sister. The father, noticing the missing cigarettes, confronts his children and hands out his punishment. Robin begins to grow up as she is confronted with the hypocrisy of her father who continues to smoke and finds that many life lessons are not black and white.
**Faulkner’s “Barn Burning”: The Battle of Blood and Conscience**

Malea Potter, Eric d’Evegnee (Mentor)

I chose to analyze William Faulkner’s short story, "Barn Burning," and use it as an example to show that many moral dilemmas appear to be a struggle between two seemingly correct choices. However, I use Sarty’s situation to illustrate that one choice will almost always turn out to be more right. Sarty is only ten years old, but already he is caught in the middle of what could be a fatal battle between blood and conscience. Many will argue that William Faulkner’s “Barn Burning” depicts a moral dilemma with the main issue being the inability to choose between two seemingly right options. On one hand, his conscience calls for justice and truth while his father—his blood—argues for strict family loyalty. In addition, the examples set by Sarty’s parents are diametrically opposed to each other. Thus, it does appear that either choice—loyalty or honesty—is arguably correct or right. However, it is much more black and white than that. Faulkner gives subtle clues throughout the story which ultimately reveal that, as in any moral dilemma, there is one choice that is correct and one that is wrong.

**The definition of America in Owen Wister’s "The Virginian"**

Tiffany Dennis, Jason Williams (Mentor)

In "The Virginian," Owen Wister explores through eastern eyes the arrival of Miss Mary Stark Wood of Vermont in Bear Creek, Wyoming. The reader learns, with Molly’s arrival in cattle-land, of a slowly, developing love between Molly and a cowboy, the Virginian. Their romance, however, is tested by contrasting customs, culture, and lifestyle. Hence, the Virginian and Molly are challenged upon their opinions on topics such as the penal system, education, and duty. The discussions between Molly and the Virginian are not only of interest to the couple, but of rising importance to America. Wister starts a quest to interpret the definition of "True America". The eastern narrator defines the opening of a bridge after a difficulty on a train voyage the “Most American Moment” (201). This passage demonstrates the friendly union between Westerners made up of Cowboys and Indians and Easterners with their rich Anglo-Saxon genealogy. The unlike train passengers come together as a result of the crisis and stand as an example of an American union. The clashes of customs, culture and lifestyle in The Virginian demonstrate the rigid pathway of coupling the East with the Western states and territories. Critics support the idea as G. Edward White explains that “the Liaison of the Virginian and Molly demonstrates the “True America” and fosters a greater harmony in the United States” (White 143). In context of this argument, I analyze Wister’s use of the word “America,” and show that it is inclusive of all the settlers of American land. (Word Count 259)
Alive or Just Background?: The Role of the Landscape in Death Comes for the Archbishop

Carleigh Wallace, Jason Williams (Mentor)

Willa Cather's Death Comes for the Archbishop follows the experiences of Father Latour as he slowly moves to New Mexico, which at the time is very westernized in relation to both the people and the land, to become the archbishop in that area. In this story, Cather uses the land to form a character that influences other characters in the book, most especially Father Latour. Graham Kirkland wrote, “Cather moves further from Realism and its established cultural views, but she maintains a Romantic view of nature influenced by Western ideologies” (37). Many times throughout the novel, Father Latour comments on the landscape, sometimes wanting to change it and sometimes admiring it. When he wants to change it, he wants to Easternize it. When he admires it is when the land is changing him and he is becoming more Westernized. When Father Latour dies at the end of the book, he is mourned by the people who are Western. The land changed and accepted Father Latour throughout his life. His eastern ideals were changed by living in New Mexico for so many years, and this changed his very nature.

Of Muggers or Men: Huckleberry Finn Chooses a Father Figure

Abby Stevens, Jason Williams (Mentor)

In Mark Twain’s novel, Adventures of Huckleberry Finn, the reader follows Huck through his own narrative as a thirteen or fourteen year old boy. Huck is at a point in his life when he is beginning to think about who he wants to grow up to be. Pap Finn neither nurturers or even remotely tends to Huck’s future, virtually making his son an orphan. Scholar Melanie A. Kimball writes that orphans “begin with a clean slate because they do not have parents to influence them either for good or for evil” (99). In Huck Finn’s unique orphan-like situation, Huck observes the men he encounters, wondering if he is doomed to revert to his father’s lifestyle of thievery and lies, or into a man with good values and morals. The man who proves to be most influential for good in Huck’s life is also the most unlikely kind of man for Huck to admire during that time period: the runaway slave Jim. Huck proves to be more loyal to Jim over his father, and he learns from Jim’s example of kindness and selflessness. Between his father and Jim, Huck is drawn to Jim because he is not only a convenient traveling companion, but also because he also maintains strong morals in tight situations. Although Huck has not mentally solidified his feelings, he chooses Jim as his father-figure because he serves as a moral compass that no other man has provided him.
Will You Take Me Home: Boo Radley’s Becoming

Andrea Dastrup, Josh Allen (Mentor)

The purpose of this essay is to examine the textual evidence which proves with certainty that the character Arthur Radley—Boo Radley—is the actual hero, not Atticus Finch, the more typically accepted champion of Harper Lee’s To Kill a Mockingbird. I will attempt to identify each piece of evidence using the theoretical grounding of Joseph Campbell’s model for the heroic journey, which he describes in The Hero with a Thousand Faces. I will also seek to clarify why Campbell’s model for the heroic journey rests superior upon Arthur Radley and, therefore, does not suit Atticus Finch’s character as well, contrary to popular belief. As I expanded my research of this topic to several databases, I found that there was, indeed, a vast amount of articles, essays, and even teaching aids written on Atticus Finch and virtually none written with the intent to memorialize Arthur Radley; that Arthur Radley’s name so rarely found is a problem. This study primarily focuses on, then, Joseph Campbell’s model for which Arthur Radley is a shy, but forthright instance of one’s passage through the Heroic Journey. Arthur Radley experiences Campbell’s Departure, Initiation, and Return upon his interaction with the Finch children, his saving their lives, and his return to the Radley House, respectively. Likewise, were the model to be used on Atticus Finch, there is clearly less change, maturation, and growth in his character. The purpose of using Campbell’s Heroic Journey is to recognize that a hero, upon his return, is not the same person to which an audience is introduced. I will argue that, though Atticus Finch has heroic elements attached to his name, he is merely a hero in Harper Lee’s novel, while Arthur Radley is the hero in To Kill a Mockingbird.

How Our Superheroes Are Letting Us Down

Susanne Robbins, Jeff Slagle (Mentor)

When superheroes first came into being they offered fortitude to people who were enduring the Great Depression, threatened by industrialism and haunted by the rise of tyrants. Superheroes once ennobled us with their willpower, selflessness and ability to overcome evil. They were a positive moral influence to their audience. However, as time has passed, society’s view of superheroes has changed. Today’s superheroes are praised for superficial and non-heroic qualities. Instead of promoting the values once used to raise people above societal concerns, superheroes now advance attitudes that exacerbate the problems society faces. The most fundamental trait of superheroes was that they represented a desire to do good. Another attribute of superheroes was selflessness. In addition, Superman and his fellows were once well known for their willpower. As our superheroes became more introspective, they completely forgot the world of humans. The selfless nature that used to be an integral aspect of the superhero is nowhere present amid the contests of strength and self-aggrandizement between today’s champions. As society accepts the egocentric superhero, motives that were once assumed to be above reproach are now doubtful. A desire to do good is no longer the main goal of a superhero. Some suggest we are attracted to role models that display the same frailties we have, but such a metamorphosis of the superhero prevents them from inspiring or motivating us to become better. They allow, or even encourage us to set aside a higher morality to embrace our lowest instincts. Whereas superheroes once clarified the difference between good guys and bad, now they are just another version of bad guy that we mistake as good.
Hawthorne's Embryonic Theme: Obsession and Isolation in Twice Told Tales

Christopher Cunningham, Dan Pearce (Mentor)

While the relationship between isolation and obsession becomes prevalent in Nathaniel Hawthorne’s writing starting with his 1846 short story collection Mosses from an Old Manse and continuing with his novels and other short stories, Hawthorne’s earliest publication, Twice Told Tales also explores this topic. The most prominent stories in this collection, “Maypole of Merrymount,” “Wakefield,” and “The Minister’s Black Veil,” all explore this theme. “Wakefield” and “The Minister’s Black Veil” explore this theme through a negative example (a character’s obsession leads to their isolation) a pattern familiar in Hawthorne’s other work, while “The Maypole of Merrymount” explores this theme through a positive example (Edgar and Edith avoid obsession and remain united). Through these examples it becomes clear that Hawthorne’s concern about the effects of isolation begins with the start of his career.
A Nonlinear Eigenvalue Problem for Fiber Optics

Matthew Jenkins, David Stowell (Mentor)

When modeling the guided waves in a fiber optic cable, Maxwell’s equations lead to an eigenvalue problem for the unknown propagation constant. A finite element discretization yields a nonlinear matrix eigenvalue problem. Such problems in general require iterative methods to compute eigenvalues and eigenvectors. In this project we will use the Newton’s Method and Inverse Iteration to calculate propagation constants. Numerical results, generated using Matlab, are presented.

Identification of short-lived radioactive isotopes using Bayesian methods

Daniel Watkins, Jeremy Kephart, Alexander Douglass, Steffanie Nestor, John Stephenson, Mitchell Breinholt, Ryan Hafen, Lawrence Chilton (Mentor)

In many situations, such as diagnosing malfunctions in the Fukushima reactor, it is crucial to be able to identify precisely which radioactive isotopes are present. Radioactive decay is a Poisson process with a decay rate depending on both the half-life of isotopes and on the number of atoms in a sample. When the half-life of an isotope is long relative to observation time, parameter estimation is well understood. However, many of the products of nuclear reactions have very short half lives relative to the observation time. We focus on this case. Here, we develop Bayesian methods to give both point estimates for the half life and the sample size as well as measures of uncertainty in the estimates. In addition, we provide demonstrations using simulated decay time data.

Modeling the Spread of Disease Using Delay Differential Equations

Scott Jordan, David Stowell (Mentor)

Delay Differential Equations are used to model phenomena in which there is a lag between interaction and reaction. Delay differential equations became popular around the time of World War I with the development of automatic control systems. Advances in numerical and computational tools have made it so they are prevalent today in many applications. In this project I explored the applications of delay differential equations in epidemiological models. I considered the SIR and SEIR models of the spread of disease. Numerical computations were done using Matlab’s DDE23 solver and the results are presented.

Momentum in the Stock Market

Mitchell Anderson, Allan Walburger (Mentor)

This study investigates the investment strategy that buying stocks that have performed well in the past will generate returns that outperform the strategy of buying a relative index and holding that index over time. Many studies, including the renowned, “Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency” by Narashimhan Jegadeesh and Sheridan Titman, have shown that buying past winners and holding them for a 3-12 month period of time, and adjusting this portfolio according to the previous 3-12 month period, will yield excess returns for investors. This study holds to the idea that investors overreact to information and a security that is trending upward will continue to trend upward until the momentum of the security has come to a stop. Therefore, buying a portfolio of stocks that are trending upwards will yield returns that are better than investing in a portfolio of stocks, from the same asset class, with a buy and hold strategy.
Orthogonal and Biorthogonal Wavelets and Image Compression

Sarah Hale, David Stowell (Mentor)

In recent years, wavelets have become prominent in image and signal processing. Like other filters, wavelets can be used to transform and compress data. This is particularly important in applications involving high-resolution images. In this project, the construction of two important classes of wavelet filters is discussed. Orthogonal filters are examined first, which are used to generate a multiresolution analysis (MRA). When symmetric filters are desired, biorthogonal filters are developed. The principle of biorthogonality is used to generate the CDF97 filter pair used for the FBI’s fingerprint compression standard. Numerical tests using various filters were performed using MATLAB, and the results are presented.

The effects of height on NFL running-back’s relative pay and performance.

N. Cole Lorimer, nelson Lorimer, Allan Walburger (Mentor)

The purpose of this project is to look into the effects of height on running-backs in the NFL. This analysis involves a basic econometric model which looks into the correlations between height, pay and performance. This is done to see if shorter running backs are discriminated against, when performance is controlled for. By taking the analysis of only the backs that are in their first contract, no adjustment to pay based on performance will be made. Thus the analysis looks into whether or not the NFL “got it right”, so to speak, in terms of payment. What will be shown is to exactly what degree height is a factor for these backs.

Video Analysis with Bayesian video decomposition and classification trees (or Where is Waldo?)

Steffanie Nestor, Mitchell Breinholt, Lawrence Chilton (Mentor)

In the past 15 years, video surveillance cameras have become very capable and inexpensive. As a result, terabytes of video data are collected daily (even at BYU Idaho) but using all this video effectively is humanly impossible. This study focused on indexing video to make it possible to quickly and accurately find objects and events of interest in the video (think Google for video). Two technologies were integrated to this end: Bayesian video decomposition and classification trees. Bayesian video decomposition is used to create a searchable index of video frames, and classification trees are used to rapidly locate search objects within the index.
Analysis of Fluoride Ion and Triclosan in Toothpaste via Gradient Ion Chromatography and High Performance Liquid Chromatography

Daniel Fry, Logan Cook, Ryan Dabell (Mentor)

Colgate Total toothpaste contains two health hazardous chemicals: triclosan and fluoride. Fluoride can kill in small doses and triclosan can bioaccumulate and interfere with thyroid hormone metabolism and damage the heart, kidneys, and liver. Colgate toothpaste packages indicate a specific amount of each chemical in each tube. The purpose of this research is to ascertain the triclosan and fluoride concentrations through high-performance liquid chromatography and ion chromatography, respectively. The concentrations obtained will be presented at the conference.

Spectrophotometric Determination of Iron in Bran Flakes.

Jeffery Powell, Rebekah Netherton, Kelly Wilson, Ryan DaBell (Mentor)

The amount of iron in generic Walmart bran flakes was determined using a spectrophotometer and potassium ferrocyanate as a standard. The bran flakes were first crushed using a mortar and pestle and then dissolved in 15M nitric acid. The unwanted organic species were then extracted using liquid liquid extraction and the iron retained in the water sample. The iron sample was then oxidized using hydroxylamine hydrochloride. Finally the iron was complexed with 1,10 orthophenanthonoline. A sample was then taken and a spectrogram recorded. This spectrogram was then compared to the standard to determine the amount of iron in the bran flakes.

Determining the Concentration of Cetylpyridinium Chloride in Mouthwash by Fluorescence Spectroscopy

Ross Davidson, Chris Hatch, Ryan Dabell (Mentor)

Cetylpyridinium chloride (CPC) is a common ingredient found in toiletries such as mouthwashes. It is a bactericide used to fight malodor or halitosis. It can also stain teeth. Ingesting too much of this ingredient can be toxic. It is not mentioned on most mouthwashes how much of this inactive ingredient is contained within the mouthwash. This experiment will help determine how much CPC is contained in five different brands of mouthwash. Fluorescence spectroscopy will be used to determine the excitation and emission peaks at various standard concentrations. This will provide the emission and excitation peaks of the five different mouthwashes to determine the concentration of each. It has been determined that other mouthwashes contain more than 0.05% concentration of CPC. The concentration will be used to rank them according to their bactericidal effect.

Determination of oxidative degradation processes of beta-carotene via UV-vis and HNMR spectrophotometry.

Parker Crandall, Jonathan Meyers, Ryan Dabell (Mentor)

Beta-carotene, a carotenoid commonly found in fruits and vegetables, is known to readily degrade by oxidative processes. Using ultraviolet-visible light spectrophotometry, the rate of degradation (kdeg) was calculated from crystallized samples under varying conditions (exposed to light, exposed to air, exposed to light and air, and isolated from light and air). Applying the Beer-Lambert law demonstrates the linear dependence of absorption on sample concentration to calculate the percent loss of the starting material over time by oxidation under these conditions. The principal oxidized product was then isolated using high-performance liquid chromatography and determined via proton nuclear magnetic resonance spectrometry.
**Analysis of Caffeine Concentrations in Several Beverages Using Capillary Electrophoresis**

Alec Larsen, Glenn Mumford, Ryan Dabell (Mentor)

A study of the verification of the concentrations of caffeine, benzoic acid, and aspartame in various soft drinks was done using capillary electrophoresis. Verification of these data was done by comparing measured amounts of these substances to the amounts advertised on the soft drinks dietary facts. Capillary electrophoresis is an attractive method of analysis due to the low cost and ease of use. The study revealed similar concentrations to the advertised amounts.

**Iron content in human blood**

Sabrina Atkinson, Tyrel Murphy, Ryan Dabell (Mentor)

There are many different methods used to determine iron content in blood. Two different methods will be explored to determine which will yield a more accurate result. These methods both will be analyzed using UV/VIS spectroscopy. The results will be compared to standard iron level values. These normal iron levels are about 30-150 ng/mL for females and 30-300 ng/mL for men.

**Analysis of UV Active Compounds in Sunscreen**

Brad Gibbons, Michael Fulton, Ryan Dabell (Mentor)

The use of sunscreen during sun exposure is a common and strongly encouraged practice. However, not all sunscreens are equally efficient or cost effective. Our research focuses on analyzing the light interactive properties demonstrated by several UV active compounds in commercially available sunscreen/sunblock. The objectives are to determine the effectiveness of these compounds at absorbing and deflecting harmful UV radiation, and whether UV activity is enhanced or inhibited in the presence of other compounds.

**Opiate Extraction from Poppy Seeds**

Lauren Holden, Justin McKell, Ryan Dabell (Mentor)

Opiates are a class of alkaloids, a nitrogen containing compound. Two such compounds, morphine and codeine, are readily extracted from the poppy plant, Papaver somniferum. These two compounds were extracted from commercially obtained poppy seeds and analyzed using a gas chromatograph - mass spectrometer (GC-MS). Data obtained from the GC-MS allowed for the determination of the concentration of these opiates in poppy seeds.

**Determination of Theobromine and Caffeine in Chocolate Samples by High-Performance Liquid Chromatography**

Lindsey Pruden, Emma Baker, Ryan Dabell (Mentor)

Caffeine and theobromine are stimulants found in the cocoa butter of chocolate bars. Caffeine and theobromine were extracted from three types of chocolate (white, milk, and dark) with varying percentages of cocoa. High Performance Liquid Chromatography (HPLC) was used to analyze the samples. The goal was to find a correlation between the amount of caffeine and percentage of cocoa in chocolate bars. Theobromine is relatively constant in all cocoa beans and thus the amount varies consistently with the percentage of cocoa found in the chocolate. This work could be useful in predicting the amount of caffeine found in chocolate and in comparing the reported percentage of cocoa on the packaging to what was obtained experimentally.
Computational Modeling of Positron Annihilation in Solids

John Barrett, Evan Hansen (Mentor)

This thesis provides an introduction to computational simulation of positron spectroscopy. The topic is approached by a two part method: first, a study of modern computational methods; and secondly, the juxtaposition of computational and experimental data, to test the accuracy of computational methods. A brief overview of positron spectroscopy provides a useful foundation, and allows for an exposition on the mathematical methods used in positron spectroscopy computation. Two Component Density Functional Theory is addressed as the principle method, along with useful simplifications; including, the Conventional Scheme, and Atomic Superposition. A case study compares experimental results of positron spectroscopy to computational results calculated from corresponding simulations. The MIKA Doppler program, developed at Helsinki University of Technology, is chosen as the main tool for the simulations because of its acceptance by the research community. The simulations model a copper super-cell—one with a single vacancy, and another with no vacancies. The resulting energy distributions are compared to experimental distributions, which were collected through positron spectroscopy on copper samples with varying amounts of vacancy concentrations. The data from the two methods show significant agreement in the effect of vacancy concentration on line shape parameter. Adversely, small characteristic differences between the compared distributions are identified and discussed. Overall, the collaboration between results in the case study lends credence to the validity of the computational methods discussed and used in this thesis.

Will Yellowstone Erupt Again Soon? An analysis using minimum volume estimates of post-Yellowstone III Caldera silicic lava flows younger than 0.2 Ma, Wyoming and Montana

Cameron Taylor, Dan Moore (Mentor)

Volumes of post-caldera silicic flows younger than 0.2 Ma (millions of years) in the Yellowstone III Caldera (PCS), Wyoming and Montana, serve as a starting point to assess the potential for future eruptions from the Yellowstone hotspot. Minimum volume estimates have not been published for most PCS flows. We estimate the minimum aerial extent of PCS flows from digital elevation models and the flow boundaries mapped by Christiansen (2001) using zonal statistics in ArcGIS. We estimate a minimum thickness for each flow based on outcrop patterns, drill-hole data, and the morphology of rhyolite lava flows. We calculate minimum volumes for each flow using our estimates of aerial extent and volume. Using flow ages from Christiansen (2001) we graph extrusion volumes through time and calculate an average extrusion rate. We estimate that at least 339 km$^3$ of silicic magma has erupted since 0.2 Ma, which is 14% of the 2500 km$^3$ silicic magma erupted during the formation of the Yellowstone I caldera, 121% of the 280 km$^3$ erupted when the Yellowstone II caldera formed, and 34% of the 1000 km$^3$ erupted when the Yellowstone III caldera formed. We suggest—based on our minimum volume estimates, observed compositional trends of Yellowstone silicic volcanics, and the present state of the sub-Yellowstone magma chamber inferred from geophysical observations—that the likelihood of another large, caldera-forming eruption in the near future is low.
**Complete Modulus Trees**

Adam Nickle, Rick Neff (Mentor)

Complete Modulus Trees are the result of applying the Chinese Remainder Theorem to tree theory. Two such trees, the Prime Modulus Tree and the Diminished Prime Modulus Tree, combine concepts in discrete mathematics and number theory to create pattern-rich structures useful for the study of the distribution of the prime numbers. These structures have resulted in the creation of a new prime number sieving algorithm and several algorithms for the alternate representation of information (encryption). While this paper defines Complete Modulus Trees, it focuses mainly on two examples of these trees: the Prime Modulus Tree and the Diminished Prime Modulus Tree. Also presented are many of the properties of these trees that are useful for the study of residue systems, Euler's totient function, and potential methods for proving the long-standing twin prime conjecture. Potential applications and areas for further research are also discussed. The intent is to compile a collection of mathematical tools that may one day play a role in putting to rest some of the longest-standing questions in prime number theory.

**Subsets of Epistemological Beliefs Assessment for Physical Science Predicts Lawson Scores and Correlates with Conceptual Understanding**

Cameron Summers, Brian Pyper (Mentor)

Correlations between EBAPS (Epistemological Beliefs Assessment for Physical Science) and various other measures of student abilities and conceptual understanding have been established by previous studies. Through administration of EPABS and Lawson tests coupled with assessments of conceptual understanding, we have found surprisingly strong correlations of individual subsets of EBAPS with overall Lawson scores. These subsets and overall scores of EBAPS and Lawson seem to correlate with the conceptual understanding portion of the assessment. Specifically, the structure of knowledge subset (SOK) of EBAPS correlates strongly with how students score on Lawson assessments. We’ll report on these data as well as implications for instruction.

**Solar Spectroscopy and the Rotational Doppler Effect**

Scott Muller, Hill Joseph, Samuel Peck, Joseph Withers, Lines Todd (Mentor), Stephen Turcotte (Mentor)

Our research project’s goal is to determine the angular velocity of the sun by analyzing the difference in Doppler shift between the different sides of the sun along its equator. Light coming from the part of the sun rotating toward us has wavelengths that are compressed, such that its frequency will be shifted slightly toward the blue end of the spectrum (blue-shifted). The light from that part of the sun rotating away from us will instead have wavelengths that are expanded, and will therefore have light that is slightly red-shifted. We will therefore take pictures of the frequencies of light at both sides of the sun, compare them using computational methods, then from the difference, we will be able to perform some simple calculations to determine the angular velocity of the sun. This project is part of a contest being put on by the physics department at Montana State University. The contest is to build a spectrograph in order to conduct some sort of research. A spectrograph is a device that separates light into a frequency spectrum (like what rain does to produce a rainbow); the spectrum can then be analyzed to determine many things, such as the composition of the material emitting the light (since each element has a unique set of spectral lines). We are designing a spectrograph whose purpose is to separate sunlight into its frequency spectrum in order to analyze the blue/red shift.
Forest Fires and Landslide Potential in the Salmon River Country

Lance Jorgensen, Julie Willis (Mentor)

ABSTRACT: Wildfires in mountainous areas can largely affect the probability of post-fire erosion and debris flows, which are a threat to lives, property, environmental resources, and man-made structures. Many attributes must be evaluated to predict and estimate the magnitude of a potential slide such as 1) the amount of precipitation and saturation of the hill slopes; 2) the terrain and slope; 3) the post-fire alterations of the stream channels; 4) and the geology of the affected area. During the summer and fall of 2012, many wildfires burned throughout the state of Idaho. One of the fires, the Mustang Complex, is of great interest due to its mountainous terrain and proximity to the Salmon River in central Idaho. Testing on individual watersheds within this research area can be done to determine the probability of any future mass wasting due to the loss of vegetation. Wildfires and debris flows are a natural process of the earth’s surface. Understanding how they are occurring will help predict and prevent future disasters.

High Momentum Analysis in Doppler Broadening Positron Annihilation Spectroscopy

Timothy Harbison, Evan Hansen (Mentor)

When positrons, the antimatter counterpart of electrons, come into contact with electrons, both of these particles are converted completely into energy which is then emitted in the form of two gamma rays. Because momentum must be conserved in the annihilation event, the two gamma rays will have energies that are Doppler shifted based on the initial momentum of the positron and the electron. During this interaction the positrons exist at thermal energies; therefore, the majority of the momentum of the system is located in the electron. The electron’s momentum will also be larger if the electron resides in shells closer to the nucleus rather than in the valence shells. Because of this difference in the momentum of the various electrons, we are able to determine certain characteristics about the structure of the electron shells in an atomic lattice by detecting the resulting Doppler shift in the gamma rays that are emitted by an annihilation event. This data is organized into an S-parameter corresponding with the percentage of detected gamma rays that display low momentum Doppler shifts, a W-parameter corresponding with the percentage of detected gamma rays that display high momentum Doppler shifts, and a momentum spectrum to show the distribution of the momentum density of the electrons in the lattice. The purpose of this research is to increase our ability to detect and identify impurities and defects in metal lattice structures and to allow us to improve the capabilities of multiple industries that utilize these metals. This presentation will explain the physics behind the Doppler shifting of the gamma rays, the process used to collect and read the data that comes from these gamma ray emissions, the usefulness of the high momentum portion of the gamma ray spectrum, as well as show how this process can be used to improve defect and impurity detection in metal lattice structures.
An Airborne Multi-Spectral Imager for the Detection of Elevated CO2 Levels at a Carbon Sequestration Site

Sean Nicolaysen, Todd Lines (Mentor)

A project to prove feasibility of a tethered balloon multi-spectral imaging system used to measure CO2 leaks at a geologic carbon sequestration site. The imager uses reflectance to gauge vegetation health which in turn can be used to measure of elevated CO2 levels. The health of vegetation is determined through the collection of reflectance data in the red and near infrared and the calculation of normalized difference vegetation index (NDVI). The tethered balloon imager is compared to a scaffold mounted multi-spectral imaging system that is effective in discovering CO2 leaks through the calculation of NDVI. Both imagers gathered reflectance data at a test site used to simulate a leak from July-August of 2012. A characterization of both imager's transmittance profiles as well as simulated spectra used to create response profiles are included. These profiles are used to show the reliability of the airborne imager data acquired during the summer 2012 release of CO2 gas at the test facility.

Spud Theory: The application of pneumatic propulsion on tuberous projectiles

Robert Burns, Skyler Hebdon (Mentor)

I will design a pneumatic potato cannon that will shoot a projectile well over a mile. One part of my research will be the blueprinting and developing of the working cannon. The second part will be actually firing the cannon and running a statistical analysis of not only the range, but also the accuracy of the cannon. My goal is to be able to shoot a potato over a mile while accurately predicting the landing site. This will include the use of engineering skills, as well as the ability to apply a physics-based analysis of a predicted and actual trajectory propulsion of a potato. These statistical analyses will then be made on the grouping of the landing sites of the potatoes using GPS equipment to provide the most accurate measurements. The cannon will be powered by a pneumatic air compressor and shot at a minimum of 100 PSI.
How does gender impact jealousy in romantic relationships?
Lisa Fuentes, Tiff Jenson (Mentor)

Whether in a significant amount or a small amount, most people experience some type of jealousy during a romantic relationship. The key focus of this research is to see what are the gender differences in romantic jealousy and if there are any. Three main types of jealousy were measured; time, sexual and relationship jealousy. Various questions were asked to get a better understanding of which gender is more likely to be and get more jealous. After analyzing the data, the finding included that in actuality there are little to none differences in gender jealousy. Both genders get jealous, the only slight difference is that women are a little more likely to get jealous if they see their partner have an emotional connection with someone else while men are more likely to get jealous if they see there partner being physical with another person. There is a slight difference but it is very small as both gender share the same level of getting jealous in romantic relationships. This is significant as it disproves the myths of there being huge gaps of gender differences when it comes to jealousy. A generalization can not be made that either men or women are more jealous than one, instead it depends on the person and situation.

Does being raised in a single-parent household increase the chance of juvenile delinquency?
Sara Arnold, Tiff Jenson (Mentor)

This study examines the effects of a child being raised in a single-parent household and how likely they are to engage in delinquency. Data was collected from Waves 1 and 2 of the National Study of Adolescent Health during the school year of 1994-1995. An In-School questionnaire was given to a stratified random sample of adolescents in grades 7-12 in the United States and later the parents of these adolescents were also asked to complete a questionnaire about their families and relationships. The results show a high level of significance between the single parent households and delinquency. This study also includes research done in the past on this same subject, which also support these same results. As more families become single parent households, delinquency rates in the country might continue to rise.

Divorce and Child-Parent Relationships
Hilary Short, Tiff Jenson (Mentor)

Past research suggests that there may be a potential conflict between parent and their children post-divorce and that this divorce can have harmful effects on the children’s overall well-being. This particular study examines the influence that divorce has had on young adults, measuring the parent-child relationship and two different stages of their life. Data was collected by sorting through the divorce records in the state of Maryland and contacting those children who were between the ages of 18-23 to participate in the study. The survey was then given to those who were selected through a telephone screening process.
Parental divorce and the impact on Children’s views of Marriage

Jennifer Seegmiller, Tiff Jenson (Mentor)

Over the years there has been widespread research done on divorce and its effects on couples and the family unit due to the divorce rate at the time, given that that the divorce rate was ever changing. This study examines the influence of divorce and children’s views on marriage. Data was collected from a longitudinal study focused on examining the consequences of recent parental divorce for young adults. The sample consisted of 257 white respondents with parents that were newly divorced and 228 white respondents who comprised an intact-family comparison group. The sample was obtained through several steps to help eliminate persons whose parents were not still in an intact first marriage. The life course framework guided the study that focused heavily on young adult behaviors.

Divorce and Juvenile Delinquency

Bailey Taylor, Tiff Jenson (Mentor)

This paper examines the role of divorce in family life structures and a link to the cause of juvenile delinquent behavior. Drawing from the first wave of National Longitudinal Study of Adolescent Health 1994-2008. High schools throughout the United States were selected at random based on if they had an 11th grade and had more then 30 students enrolled. Then from that sample 27,000 adolescents where chosen at random for an in-home interview. This study represents adolescents from the 7-12 during the years 1994-1995, then follows them with in home interviews the last one being in 2008 their ages ranging from 18-26. This study adds support on past research and shows the importance of family structure. By knowing an affect of divorce on juvenile a family will be able to help reduce delinquent behavior.

SEM and marital satisfaction

Stephen Fernandez, Tiff Jenson (Mentor)

This paper analyzes the effects that a married male viewing sexually explicit material (SEM) will have on his marital satisfaction. Data analyzed in this study was taken from the 2002 wave of the General Social Survey. By viewing of the SEM the standards held for his sexual partner may be modified to a level which is not attainable except in fantasy and distorted reality. This delves into the process as to how sexual expectations change and the strain that can be caused on the marriage. With increasing sexuality in common media and increasing accessibility to SEM in a variety of forms, implications and findings of this paper may prove useful especially in marriage counseling.
How Family Structure Impacts the Education Attainment of Children

Alysa Thatcher, Tiff Jenson (Mentor)

What are the different family structures that can be a part of a child’s family and how do these family structures have an impact on the education that a child receives or the capacity that a child has to learn? We explore many different types of family structures, such as the traditional two parent family that consists of a mother, father, and their children. We will also examine family structures that consist of single parent households, which include a parent being widowed, parents who have been divorced or separated, and parents who have never been married. We then explore which types of family structures seem to be most beneficial for children and their educational attainment. We measure the educational attainment that children receive by how far children advanced in school and also by the ability that child has to learn. We found that children coming from traditional family structures of a traditional two-parent family, consisting of biological parents and their children had higher levels of educational attainments than any other type of family structure. We then discuss the implications of these findings and we finally propose possible solutions for family structures that are not the “ideal.”

Parenting and Delinquency

Amy Arndt, Tiff Jenson (Mentor)

Previous research has been done to suggest the relationship between a parent/guardian of a child and how it can influence the child to have delinquent behaviors. Various peer reviewed journals have conceptualized the outcome of delinquent behaviors by the style the parent uses to rear the child. Through the data collection of National Longitudinal Study of Adolescent Health (NLSAH), individuals between the age of 11 and 21 were interviewed about various family relationships, drug use and other delinquent behaviors.

The Impact of Familial Support on Emotional Health

Kortnee Robinson, Tiff Jenson (Mentor)

This study focuses on the familial aspect of social support systems and its effect on the emotional health of the individual; describing the importance of social bonding, recognition, acceptance, and belonging on the individual’s psychological well-being. Other variables used to examine this relationship will be, gender, ethnicity, number of persons living in the respondents household, socio-economic status, religion, and age. Data was abstracted from Epidemiology of Depression and Help-Seeking Behavior, 1979-1983, Los Angeles, California (ICPSR 24761); a survey conducted between 1979 and 1983. All respondents were 18 years or older; residing in the city of Los Angeles during the first administration. Questions used to support the study will identify respondents feelings toward certain behaviors and the role family members play in advice-seeking situations. Findings indicated that support within the family structure is significant to the overall well-being of the individual. This study will add to previous research and attempt to provide useful information that will improve methods used for finding solutions to emotional health disorders.
Media and it's Effects on Sexually Aggressive Behavior in Today's Young Adults

Travis Klug, Tiff Jenson (Mentor)

Several studies have been completed regarding the influence media has on violence and sexual behavior in correlation to young adults. An area that has not yet been explored is media’s effect on sexually aggressive behavior. As media continues to become more violent and more sexual in nature, it is important to find the influences thereof. This study uses the National Longitudinal Study of Adolescent Health (Add Health), 1994-2008, to examine how media consumption effects the level of sexually aggressive behavior within young adults, and whether there is a correlation. The results of this study include a deeper understanding of media’s influence on the lives and behavior of today’s young adults. With this understanding, media in the future might be adjusted to curve the sexually aggressive behaviors that are seen today.

Finding the Balance: An Exploration of Science and Dance

Emily Coons, Derek Jensen (Mentor)

Often seen as irreconcilable ‘cultures,’ the sciences and the humanities are usually regulated to their separate realms. However, throughout history artists have used scientific ideas as inspiration for their works. More recently, dancers and scientists have begun to collaborate to create ‘science dances.’ Like any artistic medium that explores complex scientific ideas, there is a spectrum of ‘excellence’ a performance can fall onto. In order to create a ‘science dance’ worth watching, true collaboration and commitment to the essence of science and dance is necessary. When scientists and dancers follow this guideline, dance depicts science in a way that enhances understanding of the science and artistic elements of dance; however, when one of these ‘two cultures’ becomes less important in the creation of the dance then both the science and the dance loses their impact. Creating a science dance that upholds the best parts of the science it depicts and the art type it uses requires a careful balance that only a few performances have been able to achieve. In order for ‘science dances’ to be a viable art form and to also explain complicated scientific ideas true collaboration is necessary.

Through the Lens

Rachel Fisher, Brooke McKenna (Mentor)

My presentation will be on the benefits of taking a photo a day. Not only will taking a photograph be a documentation of your life, it is also a resource for one to be creative and show others how they see the world. I will emphasize that you do not have to be a professional photographer to do this, you just have to use a phone, pocket camera, etc. To share with others some of the things you see each day. I will go over the importance of being creative and how it can benefit us in multiple ways as well as the benefits of taking photos. After awhile of taking one photo each day, you start to create a "life collage." You are able to share your life with others in a way that will help them come to understand you and provide a way for you to understand them as well. By being creative and showing your point of view gives you confidence and character as well. It will be my goal to share this concept with others at the conference to help them see the benefits of looking through the lens and sharing what they see with others.
Social Media Delivering News
Ashley Malan, Brooke Mckenna (Mentor)

For my project I will be presenting on how social media has aided and affected the spreading of news to mass audiences. My project will be a 10-12 minute presentation using PowerPoint and will demonstrate the skills I have learned this semester in my Com 273 class called Professional Presentations.

For Better or Worse: Media and Mental Illness
Andrea Newey, Derek Jensen (Mentor)

Deficiencies in mental health are not a new concept for mankind, yet that does not mean that these illnesses have not been plagued by misconceptions since the beginning of civilizations. Although most misconceptions about mental illness have been and are still caused by a general lack of knowledge and understanding, even in today’s “age of information”, myths, misunderstandings, and stigma towards the mentally ill are still thriving. In fact, due to such modern aspects as visual media, they may be flourishing. This paper seeks to illuminate the impact of visual media, namely cinema and television shows, on the misconceptions and prejudices toward the mentally ill and the mental health field in general. It is the author’s belief that visual media portrayals of the mentally ill have impacted and continue to impact the field of mental health in both negative and positive ways, including influencing mental health reforms, generating false assumptions about the mentally ill, and, for better or worse, causing an overall change in public perception of the mentally ill.

Ten Year Dating Comparison at BYU-Idaho
Drew Wright, Scott Dalpias, Matt Carey, Kelly McCoy (Mentor)

This research project will help us to see how the attitudes of dating and hanging out have changed in the past ten years at BYU-Idaho. The data collected from this survey will be compared to data collected at BYU-Idaho in 2003 that was gathered by professors from BYU in Provo. This promising endeavor is expected to yield valuable data on dating and hanging out trends and attitudes. In this study, dating will be defined in the traditional sense of going out on dates in which the man invites a woman to go out, picks her up, and pays for the date. Hanging out will be defined as a group of males and females spending time together, who are not paired off, and where there is no commitment in regards to a romantic relationship with each other.

Do you like me?: The impact of social networking sites on self-esteem
Jesse Hardman, Tiff Jenson (Mentor)

The use of social networking sites has exponentially increased, especially among adolescents and young adults. As this phenomenon is relatively new, the research concerning social networking sites is not as comprehensive as other topics. This study uses the Monitoring the Future: A Continuing Study of American Youth (12th-Grade Survey) 2011 form 2, to examine how social networking usage affects the users self-esteem and why. Results are pending. Forthcoming implications of this work include a better understanding of the impact of the widespread usage of social networking around the world. As we further understand the effects that social networking sites like Facebook and Twitter are having on our population we can better implement strategies that magnify the positive impacts and diminish the negative ones.
Happy Meal: The Effects of Obesity on Reported Individual Happiness Levels

Megan Harper, Tiff Jenson (Mentor)

The purpose of this study is to bring Americans toward a better understanding of the effects of obesity on reported happiness. Obesity has become a main focus in American media, government, and household discussion. While research has been conducted toward a biological understanding of being obese, the purposes here are to look at the societal factors that obesity stigma places on individuals and how this affects their happiness levels. This study uses The National Longitudinal Study of Adolescent Health (Add Health), Wave IV, collected 2007-2008 to gain insight into the relationship between obesity and happiness.
The Evolution of Man in Art

Madison Hixson, Derek Jensen (Mentor)

Throughout history, changes in technology, technique, and perceptions have led to a constantly changing depiction of the human form in art. Egyptians used art to display important people through scaling, stance, and the idealized form of the body in the eye of the Egyptians, as can be seen in The Fowling Scene of Nebamun. Commence the passage of a few hundred years and cue the Greeks and Romans who are famous for their human forms. However, instead of using it as a form of propaganda, the Greco-Romans perfected the technique required to present their own idea of the ideal physique that followed with the theme of knowledge that also came from this period, seen in the Elgin Marbles, specifically The Three Goddesses. In contrast, the Early Christian and Byzantine era began to abandon this perfected form and focus more on the individual being portrayed and began to stylize certain elements that symbolized devotion to God or the individual’s eternal destiny. This is especially evident in the mosaic, The Emperor Justinian and his retinue. The Renaissance saw a revival of the perfected form and the connotations of knowledge, but also blended the traditional Greco-Roman style with Christian doctrines and ideals, especially in Botticelli’s La Primavera. Finally, the Modern period chose to completely abandon all traditions and rebel against traditional depictions of man in favor of an abstracted and disturbing form that reflects the uncertainty and pessimism that circulated through the world at the dawn of the Modern period. No piece could better embody this than the hallmark of the Modern Period, Picasso’s Les Demoiselles d’Avignon. Ultimately, the depiction of the human form is indicative of the feelings towards man, regardless of the period or time.

Women’s Religions: The Connection Between Neo-Paganism and Early Christianity

Katie Cloward, Allyson Jones (Mentor)

In “Women’s Religions: The Connection Between Neo-Paganism and Early Christianity” the author argues that Neo-Paganism and Christianity share a commonality in that during the early years of their existence they have both been especially attractive to women. Reviewing the rise of Neo-Paganism, the author touches on the history of Wicca as well as other key branches before discussing the beliefs that most Neo-Pagans have in common. Describing the Old Religion of Goddess worship and its modern incarnations allows the author to show how the contemporary religion appeals to women by emphasizing their value. In comparison, the early years of Christianity are reviewed showing a predominance of female converts and their involved role in the church. The author addresses the differences between modern Christianity, which carries a history of downplaying women, and the early Christians who followed the example of Christ regarding respect and eternal life for all. Despite the differences that exist between the two religions today, the author shows that in the first few years of each religion, they share more in common regarding their attitude towards women than might initially be assumed.
Approaching Divinity: The Role of Beauty in LDS Aesthetics
Brandon Hawkes, Derek Jensen (Mentor)

In recent years, a hastening of the work of God has been discerned by Latter-day Saints. There has been an exponential growth of outward signs, such as temple building, church membership, and increases in missionary population. However, some wonder if that same growth is taking place in the spirituality of church members. One measuring stick for this spirituality is the art being produced and consumed, because as one scholar wrote, “art reflects the community in which it lives.” The purpose of this research is to examine the role of “beauty” in LDS aesthetics. The driving force behind this research is that beauty in the arts changes human nature by showing the divine and inspiring people to approach that divinity. Study will involve determining what “beauty” is according to LDS doctrine, and will compare and contrast LDS aesthetics with the traditional philosophy. One desired outcome is the realization of what students, teachers, and patrons of the arts must do in order to approach the divine. Through this, members of the church will not only grow spiritually, but will be empowered to transform those around them in miraculous ways.

The Why of Pro-social Behavior: Altruism vs. Hedonism
Ferry Fleurimond, Lindsay Anderson, Yohan Delton (Mentor)

Understanding human behavior has always been an interest of science and philosophy. Pro-social behavior, in particular, has attracted much attention. Why do people help, especially if there seem to be no rewards? This question has had a major influence on research in the scientific world. Two well-known approaches have attempted to explain the pro-social behavior debate. Altruism claims that pro-social behavior is a result of genuine interest for the welfare of others without any thought of rewards. On the other hand, hedonism argues that people help others to maximize pleasure and minimize pain. Pro-social behavior stories of September 11, 2001 are used, and are then explained using these two approaches. The implications are noted, such as the loss of parsimony and agency. Also, applications and future studies are mentioned. Despite the conflicting claims of the two approaches, people should hold themselves responsible for their actions in order to better themselves and society.

The Cure of Folly - Fact or Fiction?
Eric McLean, Derek Jensen (Mentor)

Hieronymus Bosch, in his painting The Cure of Folly (1475-1480), presents a scene where a man is having a stone surgically removed from his brain. This stone was thought to cause madness, or folly, and upon its removal the patient would be cured from mental illness. Most researchers agree that Bosch’s painting, as well as a handful of other Dutch and Flemish paintings depicting similar scenes, are fictitious and have no root in actual medical practices of the day. What if this isn’t true? What if Bosch was painting a genre scene that simultaneously showed an actual surgical practice as well as the folly in such a surgery? Looking at a Bosch’s painting and other similar paintings of the 15th and 16th century, there is some evidence, even archaeological data, to throw into question the established academic opinion that this practice of removing a stone of folly from the brain never occurred.
**How does education impact one's view on illegal immigration and why?**

Michelle Prieto, Tiff Jenson (Mentor)

Although there have been many studies performed on immigrants, there is a limited amount of information on the opinion of illegal immigrants. I hope to understand if there is a relationship between the opinion of illegal immigrants and the amount of education the respondent has received.

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**The Educated Terrorist: A study on the relationship between the education of a terrorist and their success in a terrorist attack.**

Josh Preator, Tiff Jenson (Mentor)

Many stereotypes show terrorist groups as organizations comprised of irrational radicalists who will do anything to promote their political agendas. This study examines the characteristics of terrorists and terrorist organizations on a more professional level; particularly how a terrorists’ level of education affects his or her success in a terrorist attack. Data was collected from The American Terrorism Study which compiled information of 574 terrorists arrested for terroristic crimes from 1980-2002. The data include background information for each terrorist including highest level of education attained, the number of charges against the individual, and the type of terrorist attack. The results show a high level of significance between the highest level of education attained and the success rate of a terrorist attack. These findings help researchers better understand terrorist organizations and the individual terrorists themselves. By finding out what makes a terrorist successful, we can know how to combat them more successfully.

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**Uneasy Neighbors: A Comprehensive Analysis on Illegal Immigration from Mexico to the United States.**

Jorge Alvarez, Luis Gonzalez, Jeremy Lamoreaux (Mentor)

This brief looks at the history of the Mexican-U.S. migratory relationship and reveals a pattern of mutual economic opportunism, with only rare moments of political negotiation. Throughout the last century the U.S government has liberalized or tightened its immigration policies based on the demand of low-skilled Mexican labor, while its southern neighbor has displayed a uniform pattern of diplomatic avoidance as illegal immigration enables Mexico to export the issue of high unemployment and base 23% of its GDP in American remittances. Additionally, the growing economic interdependence that both countries have experienced over the past few decades introduces two variables that directly correlate with the exponential increase of Mexican aliens into the U.S. since 1994: NAFTA and the War on Drugs. As of today, 56% of illegals in the U.S are Mexicans accounting for nearly 8 million. Additionally 1 in 3 murders in U.S. Border States is attributed to Mexican illegals, creating discontent among Americans. Conversely, Hispanic issues, such as immigration reform, have recently come to the forefront in American politics due to the political force that Hispanics possess, as illustrated during the 2012 presidential elections. This paper provides a historic analysis of major foreign and domestic policy/affairs in both nations that identify patterns of political and diplomatic nature that have 1) attributed to the restrictionist approach towards U.S immigration policy and 2) failed to provide adequate solutions to this ever present immigration issue. Finally, it surveys potential solutions that involve bi-lateral negotiations, since the absence of such helped trigger this problem in the first place.
Political Correctness: The Consequences of Intolerance for Intolerance
Charis Emrich, Sheldon Lawrence (Mentor)
This five page persuasive research paper discusses the development and overdevelopment of the political correctness ideology. Society is examined through specific incidents to show how the desire to avoid intolerance has crossed appropriate boundaries into the realm of punishing creativity and free expression.

Spanish Grammar: Prescriptive rules vs Common use
Denisse Baxter, Mar Ribera, Clint Dennis, Matthew Alba (Mentor)
Exploring the differences in prescriptive rules of Spanish grammar and how well they are applied in common everyday use. A focus of the Advanced Spanish Grammar class taught by Brother Matthew Alba is the in-depth study of prescriptive rules; understanding where they come from and how they are fully applied in communication. Yet even with these rules, we find that the daily use of language tends to invent or omit various rules on a daily basis. We will be focusing on a single prescriptive rule and through interviews with native speakers and research through an online corpus, find the commitment that everyday speakers demonstrate to following these rules.

Criminal aliens: An analysis of the criminal behavior of immigrants to the United States
Alan Brereton, Tiff Jenson (Mentor)
The present study will investigate the possible correlational relationship between immigration and crime. This relationship will be analyzed using the National Neighborhood Crime Study (NNCS), a year 2000 amalgamation of census tract-level data involving the pertinent variables, immigration rate and crime rate, of 9,593 census tracts in 91 cities in 64 metropolitan areas across the United States, which are then compared at the appropriate region. The present study will speak to the often harsh accusations made by many that the entirety of immigrants are violent and immigrate to the United States in order to victimize American citizens. Analysis of the data reveals a weak negative association between immigration and crime, growing slightly more negative as other variables are controlled for—indicating that, if anything, immigration to an area has almost a suppressive effect on crime, however small. These findings, implicating and discussing the possible need for a change in criminal law and policy, immigration policy, or both, will be of interest to public officials and their constituents nationwide.
The Last Stand
Rodolfo Funes, Janet Christensen (Mentor)

The evident lack of empirical data present in the study of corruption creates an interesting atmosphere for its further development. Although corruption has proved difficult to monitor and eradicate, there are alternative remedies for this cancer which threatens our diverse global society. In this research we evaluate the different causes of corruption—including human nature, financial instability, and a self-perpetuating system of corrupt activity; also, the role that education, the Rule of Law, and a global anti-corruption task force could have in the fight against corruption. By evaluating these factors we find who the participants are, what their actions are and what they constitute; such as increased crime rates and a heightened perception of fear that intrinsically comes with corruption. Through the research we have been able to develop a definition of corruption that can be more narrowly tailored to each specific state, culture, and individuals. This is achieved by stating and defining specific actions that are immoral by nature. With the research done, a hypothesis is developed by which means corruption can be fought. With the implementation of the prescribed methods, this cancer can be defeated within our global network by allowing individuals to speak out against these practices, educating them on how to prevent being taken advantage of, and giving them the means by which to defend themselves through knowledge. Each step can be also applied to improving the economy and increasing bureaucratic efficiency.

The Gender Gap and the Glass Ceiling: The Choice Gap
Hannah Cline, Janiel Nelson (Mentor)

The phenomena known as the Gender Gap and Glass Ceiling are not so much the results of gender discrimination imposed by corporations or businesses, but occur more from either women’s conscious decisions or from psychological barriers imposed unintentionally by the women themselves. In this presentation, the author explores the viewpoint that, while a gender gap is a reality, it is not a result of attacks or judgment against women based solely on gender, but stems from the fact that men and women tend to make different life choices based on their different values and attitudes. Also, while statistics show fewer women in prominent positions than men in the workplace, this perceived “glass ceiling” is a psychological barrier erected in the minds of women who subconsciously lower their expectations for their careers. The biggest influences on these expectations are interactions within families or schools. Narrowing or closing the gender gap itself is not necessarily a high priority as it is mostly the result of women exercising agency in their own lives.

Understanding Cultural Problems in Mexican Classrooms: Identifying and Attacking the Root of the Problem
Alejandro Raygoza, Rex Christensen, Ruth Aquino, John Ivers (Mentor)

This document explains five different cultural paradigms in the Mexican culture: Power Distance, Uncertainty Avoidance, Long-Term Orientation, Polychronic time and Collectivism. It states the problems and misunderstandings that teachers and students face that are rooted in these cultural paradigms. The problems stated in this document have its source in the misunderstanding and misinterpretation of thinking and behavior driven by culture. The solution to these specific problems lies in teachers and students understanding their own culture which will lead them to realize how culture affects their thinking and behavior.
A Neurofeedback Study for the Psychology Department Website

McKlin Burnell, Shaina Tiritilli, Eric Smerdon, April Mitchell, Yohan Delton (Mentor)

Neurofeedback is an emerging technique for businesses to evaluate consumer responses. It entails consumers being connected to an Electroencephalograph (EEG) and being exposed to a product. In our study, we identified excitement and frustration levels while participants were surfing the official Psychology Department website. We had 5 participants connected to an EEG; each participant was asked to do 3 point-and-click tasks. We used the EEG Emotiv technology to support our observations and to offer recommendations to improve the website.

Creation of a Scientific Exit Survey for the BYU-Idaho Department of Religious Education

Lindsay Anderson, Yohan Delton (Mentor)

I created an exit survey for the Department of Religious Education at BYU-I to assess students’ changes in religious attitudes and habits as a result of the religion courses taken during their college study. To assess the change of religious attitudes, we received a list of objectives from the Religion Department and had students rate their growth in those areas using a Likert scale. We assessed changes in religious behaviors by developing a list of behaviors, such as prayer and scripture study, and had students rank their progress in these areas, also using a Likert scale. We tested the frequency and meaning of religious behaviors. We also assessed teaching techniques used in the religion courses, and compared the effectiveness of these techniques in on-campus versus online religion courses. A pilot survey was run on 100 seniors randomly generated from the student population, and the results were used to improve the quality of the survey. This measurement instrument will continue to be used to assess seniors at BYU-I and help the Religion Department improve their courses to better meet their department goals.

Does Eating Breakfast Impact One’s Academic Success? Exploring the Effects Eating Breakfast Has on Grades

Tressa Lyman, Jacqueline Roark, Eric Gee (Mentor)

Previous research has shown us the importance of eating a healthy well balanced diet and the impact that this has on day-to-day life. More specifically there has been research that points to the importance of eating a well-balanced breakfast. Because of this we know that there can be many positive effects that come through eating breakfast, in this study we would be exploring the impact that eating a healthy breakfast would have on a student’s ability score well on an academic test. To accomplish this goal we propose conducting a study at Brigham Young University, with 50 students, ages 18-45. In our study we would randomly assign each student to one of two groups. One group would be given breakfast, a lecture, and then an exam on the lecture. The other group would be given a lecture, a test on the lecture, and then breakfast. Once both groups have completed the study we will then look to see the differences in the test scores. We suspect that we will see an increase in test scores in our breakfast first group.
Eating Healthy Can Affect Academic Achievement
Jacqueline Roark, Tressa Lyman, Eric Gee (Mentor)

The main purpose of this study is to find out if healthy nutrition affects students’ school performance. It hypothesizes that students with a healthier diet do have significantly higher academic achievement. This study will send out surveys through electronic mail to 400 Brigham Young University-Idaho students. The survey design by the researcher, the questions will include how often do the students eat vegetables, fruits, and whole grains. The researcher was aiming to find out the academic performance by having students list their grade point average. The sole purpose of this research is to find out if there is a positive correlation between eating healthy and academic achievement.

Educating Learned Helplessness: An Experimental Attempt to Reverse its Adverse Effects
Sarah Trefflich, Eric Gee (Mentor)

Learned helplessness, as classified by Martin Seligman, can be defined as psychological phenomena wherein organisms placed in an experience beyond their perceived locus of control act helpless in similar situations wherein they feel no control. Research shows that one way to reverse a ‘helpless’ response in humans is to give positive praise to those effected, such that they feel their efforts, even when they did not succeed entirely, were not completely in vain. This experiment posited that perhaps another way to combat the adverse effects of learned helplessness is to educate participants about learned helplessness and its underlying concepts. We investigated whether or not the effects of learned helplessness (LH), once induced by an unsolvable maze, can be reversed by dividing BYU-I students into groups, administering the mazes and then an anagrams test. ANOVA test showed no significant difference between group means. Weaknesses of the experiment include the small sample size. Ideas for further research include what about the education itself helps reverse LH and how this can be applied in a practical setting.

Andrew Lowrey, Elliot Dennis, Michael Petty, Eric Gee (Mentor)

Collegiate group work is an ever increasing trend in American universities (Gamson, 1994; Colbeck, Campbell, & Bjorklund, 2000; Huxham & Land, 2000). However, when constructing collegiate groups, faculty members often use methods that lack empirical support (Huxham & Land, 2000; Hounsell, McCulloch, & Scott, 1996). Typically, groups are formed using one of the following methods: 1) Allow students to choose their own groups, 2) Allocating students to groups randomly (i.e. random assignment, alphabetical order, etc.), or 3) Engineer groups based on either homogeneous or heterogeneous characteristics (i.e. personality type, gender, age, etc.). Theory and research in this area conflict, suggesting constructing groups based on either homogeneous or heterogeneous characteristics is most effective (Jaques, 1984; Katzenbach & Smith, 1993) while most faculty disregard the conflict all together and use the practical approach of methods one or two (Hounsell, McCulloch, & Scott, 1996). Regardless of the method used to construct groups, an overarching motive is to increase performance, cohesion, and satisfaction within the group (Keyton, 1991). The attempts to engineer groups based on specific characteristics (either heterogeneous or homogeneous) produce results comparable to randomly assigned and self-selected groups (Huxham & Land, 2000). The present study will revisit group engineering, however, we attempt to measure the impact of a perceived characteristic commonality rather than an actual one. The current study will investigate the impact of a perceived fake personality commonality among group members.

Steer in the Headlights: A Practical Application of Cone Saturation

Risto Snow, Eric Gee (Mentor)

Driving on today’s roads at night can be perilous. The use of bright headlights from oncoming vehicles can not only hurt a driver’s eyes, but impair their ability to see everything that is happening on and around the road. It is essential that a driver be aware of other moving vehicles, road obstacles, and pedestrian intentions if they are to safely manage their own vehicle. Many accidents have occurred due to distraction and inability to correctly see what is happening on the road. The hypothesis of this study is that vehicle headlight color affects our ability to perceive road obstacles and occurrences. Our eyes can perceive every color in the visible light spectrum, though there are three different color-perceiving cones. Of the three, only one effectively perceives blue and purple wavelengths. The issue with bright headlights on vehicles is the intensity of the white light. White light is a mix of every color in the spectrum. Therefore, being exposed to bright white lights causes all three color cone types in the retina to become bleached, or temporarily less sensitive to light and subtle details. The cones need time to recover from the shock of too much visual stimulation, especially in the dark of night. If headlights were instead predominantly blue in color (affecting mostly one instead of all three color cones), a driver might be better able to perceive the road even if the oncoming headlights were very intense. This hypothesis was tested using 28 research participants on the 7th of March.
Student Leadership in the Research and Creative Works Conference

Anna Nielsen, Hector Becerril (Mentor)

The Research and Creative Works conference enables students of all majors to come together and present the fruits of their academic labors in a professional setting. As the only academic venue that reaches out to every corner of campus, the conference is also an opportunity completely unique to BYU-Idaho. No other university brings together this variety of submissions while maintaining a conference structure and providing individualized feedback to every participant. Another unique feature of the conference is that it is executed by students. Our student team works all semester to organize every aspect of this venue. As a result, the team gains valuable experience in leadership and teamwork while providing a service to everyone on campus and in the

The Effects of Music on Studying

Sarah Rae, Holly Vogelsberg, Eric Gee (Mentor)

College students of this generation have been raised and identify with music and spend many hours listening to the music of their choice (Becknell, M., et al, 2008). In a study done by Furnham and Bradley (1997), it was found that 68% of students listen to music while they study. The overlying goal of going to college is to graduate with a degree, so it’s important that every effort be made to inform students of things that could affect their performance on class assignments. College students have claimed that music is a stress relaxant and aids in being able to complete needed assignments, but studies have shown that our brains can only focus on a certain amount of tasks or incoming information at a time, so music may be a distractor (Konig, 2005). For many decades, a significant amount of studies have attempted to target the effects of background music on performance (Wolfe, D. E., 1983). Results are inconsistent, yielding different findings from study to study. Some researchers say that music improves or enhances performance while others say quite the contrary and state that it has no effects on performance whatsoever (Wolfe, D. E., 1983; Dobbs, S., Furnham, A., & McClelland, A., 2011). Because this is a largely practiced habit, there needs to be more concrete evidence to say whether listening to music actually improves the attention while studying. The proposed study will assess performance of students recalling a list of words they must attempt to memorize while listening to popular music of the day, instrumental music, or nothing at all. While attempting to measure the effects of listening to music vs. not listening to music, a third group is added to see if type of music makes a difference to the scores. We hypothesize that popular music will serve as the biggest distractor and lowest test scores, followed by instrumental music, while the studying in silence will yield the best results among students. If the hypothesis is correct, it will aid students in being able to study in an environment that is best suited to retaining information.
Fremont County Best Practices Analysis - Green Economy

Garin Rydalch, Becky Weger, Jack Fuller (Mentor)

The four counties of Southeastern Idaho and Wyoming received a sustainability grant from the US Federal government. A portion of the grant was used to conduct a best practices analysis of a green economy. The areas of the green economy that were researched include; Renewable Energy, Waste Management, Alternative Transportation, Water Management, and Land Management. Research was conducted on two communities, two cities, and two international countries to analyze and determine best practices. Renewable Energy, Waste Management, and Alternative Transportation, in their respective order, were areas of the green economy that were focused on the most throughout the research. Results have shown that improving community awareness of a green economy has been a vital start to developing a sustainable initiative. In Golden, Colorado and Moscow, Idaho the base of their foundation of a sustainable initiative has been in community awareness, cooperation, and local partnerships. Results have also indicated that on a community level job creation of a green economy is minimal. On a larger scale of Seattle, Washington and Portland, Oregon there is more job creation and opportunities to expand the green economy because of their overall resources. For Renewable Energy, creating a home energy audit program and a solar program yields higher job creation opportunities. For Waste Management, rural drop off stations throughout a community or city and partnering with the local recycling plant yields higher job creation opportunities. For Alternative Transportation, methane conversion and public transit yields higher job creation opportunities. The limitations of the report are that it is a broad overview of many best practices implemented by the communities, cities, and international countries as opposed to researching a couple best practices. Finally, overall research indicates that job creation potential is at its highest when the green economy focus area is highly populated.

"Spring Into Green"- A 4-H Day Camp

Kelli Radford, Brandi Evans, Shantel Tavoian, Alyssa Rangel, Melissa Hobbs, Leslie Hagen, Cheryl Empey (Mentor)

Juniors and Seniors in the Family Consumer Sciences Education major will present a Teach and Learn FCCLA STAR Event. It will be about developing, implementing and evaluating a community 4-H Day Camp. This camp was held on March 16, 2013. FCS Ed. students conducted a "Spring into Green" themed camp. Youth were taught in three areas of Family and Consumer Sciences Education: Foods & Nutrition, Textile Construction, and Housing. Students served on the 4-H Day Camp committee in preparation for this great day. Community youth were invited and enjoyed being educated by energetic college students. This will be the first "Teach and Learn" team presentation that will prepare them for national competition. They will be the first Collegiate FCCLA team to compete from BYU-Idaho. The presentation will showcase their efforts in developing the program, conducting the program and assessing it success.
BYU-Idaho Placement Analysis

Mitchell Dean Anderson, Ryan Burkhardt, Kevin Poaletti, Garin Rydalch, David Barrus (Mentor)

This unprecedented study investigates which independent variables influence the status of BYU-Idaho students at graduation whether they are employed, unemployed, or continuing their education at a higher level. It is hypothesized that various independent variables within different degrees, departments, and colleges will have specific significant levels that determine the students’ post-graduation opportunities. This study seeks to identify these variables, thus showing how successful BYU-Idaho is in preparing their students’ for opportunities after their education at this institution.


Harley Davidson, Janiel Nelson (Mentor)

Household outsourcing causes parents to be absent from the home, negatively affecting children through mental and psychological instability, increased crime rates, and lack of childhood and social skills. Household outsourcing is the act of “paying someone else to do one’s work” in work related to the home (Goldsmith, 2010, p. 300). Types of household outsourcing include meal preparation/cooking, child care, shopping, yard work, pool cleaning, interior design, home improvements, personal service companies, etc. Society has changed drastically in the last half century. In 1940 only 8.6% mothers were employed, compared to 70% in 1996. The growing trend is for the home to consist of two working and busy parents. The author, Harley Davidson, chose this topic as a result of her struggles in her childhood with two working parents. She has extensive experience with household outsourcing, including working in the food industry, babysitting children numerous times, and raising her five siblings when her parents were absent. Her opinion on the subject of outsourcing in the home is there should be little to no outsourcing.

Retirement Planning

Rachael Porter, Janiel Nelson (Mentor)

According to a recent Gallup poll, the average non-retired American now expects to retire at age 67, up from age 63 a decade ago, and age 60 in the mid-1900’s. The same poll finds that fewer expect comfortable retirement. This essay issues three specific reasons as to why American citizens fail to retire comfortably and remain satisfied with their new way of living. Through much research, it’s been discovered that retired people feel aimless and useless. Without roles, people feel a sense of loss and lack of direction, and the loss of work routine can be extremely disconcerting. Within each of these three conclusions, there is a substantial amount of evidence and quotations that show full support. Regardless of these issues, there can only be one solution, and that is through the use of a retirement plan. In utilizing a retirement plan, both a 401(k) and a plan to keep active and healthy, the majority of seniors suffering from these issues will be able to be at peace, and enjoy a life well lived.
The Impact of Socio-economic Status on Domestic Violence

Trevor Monson, Michael Abel (Mentor), Tiff Jenson (Mentor)

Domestic violence has affected families for generations and a plethora of research has tried to explain its causes and why it continues to exist within society. Explanations vary from drug abuse, lack of personal control in one’s life, stress, or even conflicting gender roles. But behind all of this there tends to be one recurring theme that of the socio-economic status of those involved in domestic violence. I intended to show that there is a direct correlation between the socio-economic status and the likelihood that domestic violence will more likely occur with those who are lower on the socio-economic ladder. This research used the data found from the 2001-2006 Inter-University Consortium For Political And Social Research (ICPSR) of 17,404 randomly sampled college students from 32 nations. I created and recoded variables to produce 2 scales, one for the socio-economic status and the other for domestic violence, which would be primarily used to find out if there is a correlation between the two. The results from this research showed that there is no significant relationship between socio-economic status and domestic violence. This may be due to the fact that there are other variables that are more likely to indicate that domestic violence will occur. Such variables that could be taken into future account and further studies are race, gender, the status of relationships in the home, the stability of the relationships, etc. These results show that there must be other key factors that will give a stronger indication of the likelihood that domestic violence could occur in a household. Further research should look to other factors that will give stronger indications that domestic violence will occur if we wish to find out the early warning signs and take preemptive action to make sure that this social problem can be curbed, at least as much as we are able to.
Get Fit, Don't Quit

Christopher Caravello, Ariel Johnson, Benjamin Wood, Beth Hendricks (Mentor)

We created a research project that asks the question, why do BYU-I students give up on their workout programs and goals. This project centered in asking questions through a survey, using an observation group, and a focus group. I will be presenting the results gained from the project with a special emphasis on the observation and focus groups.

Educating Out the Creativity: The Impact of High-Stakes Testing on Student Creativity

Tyler Beus, Tiff Jenson (Mentor)

Educating Out the Creativity: The Impact of High-Stakes Testing on Student Creativity studies how high-stakes testing within public education impacts student creativity. It focuses on standardized testing and how it has become a major instrument within our current educational system. The research uses the Early Childhood Longitudinal Study, which uses a cohort sample of the Kindergarten students following them from 1998 to 2006. The study samples creative thinking abilities of the students. As the samples progressed in years, standardized testing is used more frequently. The contribution of this research will help to determine the resourcefulness of standardized testing and the future of the effectiveness of public education.

The affects of after school activities on delinquency

Paul Fullmer, Tiff Jenson (Mentor)

This study addresses the effects of structured activities after school hours and its effects on minority students and their rate of participation in delinquent activities. This will be a replication of prior studies but will focus on the minority population and what activities benefit them the most. The information was gathered from the first wave of the Add Health study. This is a survey study given to adolescents and their guardians in school as well as in their home. The study was administrated from 1994-1995 to 12,105 adolescents. The findings are still unknown, the data is set to be run through a regression. The data will show what activities are best used to lower the rate of delinquency among adolescents that are minorities. This will help us to better use resources to help minority teens stay out of trouble by giving them constructive activities that will expand their minds and help them succeed later in life.

The Effect of Extracurricular Activities on Academic Success

Megan Welch, Tiff Jenson (Mentor)

Past research, in regards to participation in extracurricular and its effect on student academic success, has generally shown a moderately positive correlation between the two variables. This study broadens the definition of extracurricular activities in an effort to better understand what it is that effects student academic success. Data were collected from the first wave of the National Study of Youth and Religion. The survey was used to interview youth and their parents. Information relating to extracurricular activities and academic success was analyzed.
Teaching Virtue: The Merits of a Liberal Education

Seth Williams, Janet Christensen (Mentor)

There are many challenges facing our educational system. One of the most strident challenges in education today is the lack of involvement on the part of the student and fear on the part of the teacher to involve morals. Both of these problems seemed to be less present in the past eras, when education was a liberal education. A quality education has the ability to give its students an understanding of self worth and purpose. An education can have this capacity and help the student understand his or her potential. A quality education should help us to doggedly pursue our goals and develop the mettle necessary. Once we have that sense of self worth and personal mettle, it leads to free and independent thought, instead of just being lead about on a leash. As we become free and independent thinkers we attain a personal moral code, not merely conformists to some greater unity of thought, but an individual with personal beliefs. Any teacher can provide this atmosphere of free thought and not preach from the lectern. Every student has this potential.

Sport Participation and Academic Performance

Craig Packard, Tiff Jenson (Mentor)

The purpose of this study is to explore the relationship that sport participation has in reference to academic performance. Literature was reviewed on past research on the topic, which provided a broad understanding of the subject. Often research has shown both a positive and negative correlation between sport participation and academic performance. Races, gender, age, duration of participation and socioeconomic status have been shown to effect variables such as GPA in different ways. The data set, “Monitoring the Future: A Continuing Study of American Youth” is what we used in our analysis and was collected by staff from the University of Michigan and resulted from polls given to 8th and 10th graders from the late 1990’s to early 2000’s. The data set we used specifically for our analysis was solely from 8th graders early on in their data collection. Currently we are summarizing the results as we seek to understand if there is a positive correlation between sport participation and academic performance. However, research does seem to show that there is a positive correlation. Those who tend to participate in sports tend to have higher grades on average than those who do not. This does not justify a causal relationship, but there is a trending correlation amongst other research.

Juvenile Delinquency Impacting Educational Aspirations

Rachel Weinstock, Tiff Jenson (Mentor)

This study was designed to examine the effects of delinquency on educational aspirations. Data was taken from the 2010 “Monitoring the Future: A Continuing Study of American Youth-12th Grade Survey”. Factors such as substance and alcohol abuse, and skipping class were used to evaluate the ramifications of delinquency on aspirations of graduating and attending higher levels of education. This analysis supports/does not support the relationship between delinquency and education aspirations. The paper’s relevance and contribution will be discussed.
Educational Attainment and Arrest

Dustin Nuttall, Tiff Jenson (Mentor)

Where there is knowledge of the law there is crime, or a deviance to the law. This study focuses on educational attainment and its impact on the likelihood of being arrested. It can be compared to Lochman’s (2004) study, although with more focus on education than on monetary values. Sabates’ (2008) study on the effects of poverty and lack of education on young-adult behavior helps to correlate this theory, but expounded to adult behavior. The fourth wave of the National Longitudinal Study of Adolescent Health (Add Health) survey was used in this paper. There is a correlation between education and crime showing that as a person obtains a higher educational attainment, the less likely the respondent will develop criminal behavior. This paper is to expound on what role education plays in criminal activity and can be used as evidence that education does impact a person’s likelihood to be arrested.
Autism’s impact on Family Stress
Wade Leavitt, Tiff Jenson (Mentor)

Through personal experience in working with children with Autism, I have observed an area of concern due to the parameters regarding families with Autistic children present in the home. I have learned that individuals diagnosed with Autism are different in behavior, and learning; therefore parenting must be different to accommodate these special needs. Research was conducted to indicate if these personal notions are valid before new types of counseling, parenting skill, and treatments are established for such families. The question was posed; How does having an Autistic child impact family stress, and why? Literature conveyed the notions that were suspected by my personal observation. Previous studies became helpful to determine a conflict with in the families with Autistic children, and verifying that further research apropos this situation was valid. In pursuing more information regarding this situation, research was contributed by The National Survey of Children’s Health, 2003. The independent variable of Autism and a scaled dependent variable were determined and originated from this data help determine the following results.....

The Effective Use and Satisfaction of Personal Emergency Response Systems Among Older Adults
Elliott Dennis, Jack Fuller (Mentor)

This paper was commissioned in order to understand the older adult’s interaction with and preference of the personal emergency response systems (PERS). In specific, its aim was to provide a list of possible improvements to the design and consumer experience. More than 14 issues were encountered during the pre, post, and observation process. These problems below are summarized into five main sections: Demographics, pre-product perceptions, product experience, post-product experience, and future directions. Some of the main problems encountered were: Participants being unable to differentiate the device from the charger, difficulty opening the box with their hands, not calling to activate the device, believing the product comes pre-set up, and unable to find the SOS button. Some of the limitations while conducting the research were limited demographics, living locations of some participants, small effect size, and a relatively small sample size. Further research can be conducted in learning how these changes are consistent among other devices that older adults purchase.

Depression’s effects on facial recognition of emotion
Ashton Holbrook, Richard Whiting (Mentor)

Projective testing has been used in the field of psychology for years. Its usage has not been without controversy. It has been long disputed that projective tests lack the structure of standardized tests and as such results can be widely interpreted. This exploratory research project is attempting to look at projective testing from a different angle. Instead of presenting vague or abstract stimuli to test subjects we are doing a pilot study to test the effectiveness of using familiar, yet neutral images of people presented to test subjects. These images were presented to people and they were asked to describe which emotion is present and what scale that emotion is occurring. Through comparative data analysis the results of this exploratory research will be compared to other forms of standardized testing and evaluated for consistency between tests. If consistencies are found the long term goal of this analysis will be to develop a measure that can be used to track the effects of therapy on a depressed population.
The Connection Between Religion and Health
Tara Derricott, Tiff Jenson (Mentor)

Past research in religiosity suggests that there is a link between the religious commitment of an individual and how they perceive their health. This study examines the influence of the level of religious commitment on the health of individuals, expanding on past methodology by controlling for demographic differences and using several different measures of religious commitment and health. Data were collected through a national survey (2010 GSS), conducted by the national Opinion Research Center. Full probability sampling was employed using a national multi-stage cluster sampling technique. A rotating panel was used, including new respondents and those that participated in the 2006 study (n=4901).

A Study of the Effects of Homosexuality on Religiosity
Garrett Allen, Tiff Jenson (Mentor)

This paper examines the association between homosexuality and the effects that it has on an individual’s religiosity. The National Longitudinal Study of Adolescent Health Wave 4 (Add Health) from 2008 was the data set used for this study. The typical homosexual individual will feel less welcome in many religious environments due to the teachings and values that are encouraged by that religious institution. Individuals who are not readily accepted in an institution are more likely to not have a regular relationship with that institution. Through the analysis, the relationship between homosexuality and religiosity was supported. Suggestions and implications for future research will be discussed.

How etiquette affects interpersonal relationships
Ryan Crocket, Jon Jacobs, Kateryna Christiansen, Rebekah Hampton, Gary Hawley, Lane Williams (Mentor)

With etiquette fading in today’s society it is intriguing to know how etiquette is affecting our relationships in today’s world. Therefore one focus group will be appropriate to observe students actions and reactions to etiquette (or the lack of it). The facilitators will hold twenty-minute focus group. To start the session, there will be a preliminary survey given to obtain palpable answers to guide the discussion. The group will write their questions down on a paper before sharing with the group. Then throughout, two variable (actors) will demonstrate set standards of good and poor etiquette. The discussion will be guided by a neutral mediator and the survey answers and etiquette behaviors will be discussed and analyzed with the focus group. During this entire process we will have two observers in the back of the room taking notes. The entire session will be recorded both on video and audio. The parameters are roughly based on a previous study on behaviors measured qualitatively.
Religious Commitment and Depression

Carly Rodrigues, Tiff Jenson (Mentor)

Depression is prevalent in the American society, and the cases of diagnosed depression seem to be growing. The objective of this study was to find other ways to help decrease depression other than prescribing medicine. There are many factors that can affect depression, but in this study, the factor that is examined in the research is Religiosity. Data from the General Society Survey (GSS) 2006 was gathered which had interviews consisting of discussions concerning the respondents strength of religious affiliation, church attendance, prayer frequency, and religious activities attendance. This was used to build a religious commitment scale and was measured against data on depression, which was also pulled from the GSS. A regression was run to find if there was an existing relationship between religious commitment and depression.

How does Religiosity Impact Depression in Adolescents and Why?

Rebecca Hutchinson, Tiff Jenson (Mentor)

This study examines the relationship between religiosity and depression in adolescents, providing support and clarification to previous research done on this topic. The data was collected in the fourth wave of the National Longitudinal Study of Adolescent Health in 2008. This data was collected with in-home interviews of the adolescents. 5,114 cases were completed. These interviews included many questions that corresponded to the respondents’ aspects of life such as religion, racial identification, and health. I expect to find that the higher level of religiosity, the less likely adolescents are to experience depression. If this is found, it will support and clarify this relationship between these two topics. These findings could be potentially used to aid preventative measures against depression in adolescents.

Addressing the Problem of Self-Centeredness in Marriage

Adam Bertoch, Joseph Ostenson, Bradford Wiggins (Mentor)

The majority of marriage researchers view self-centeredness as a threat to successful marriage. However, the way in which success in marriage is currently understood may inadvertently facilitate self-centeredness. This paper will explore the reasoning behind its prevalence and provide a healthy alternative to the self-centered approach in marriages and relationships.
A Look Inside Gun Free Zone Safety: Analyzing Incidents of Mass Public Shootings
Shaun Grigg, Tiff Jenson (Mentor)

As the title of this paper indicates, I will bring to light and discuss the important facts of why mass shootings occur almost exclusively in gun free zones. Although rare in incident, mass public shootings have happened on average once a year for the past 50 years. This paper will spend very little time and space dealing with gun control law and mostly deal with the reality of finding out if gun free zones are inherently susceptible to the devastating phenomena of mass public shootings. Most of the data retrieved for this qualitative research paper is a compilation of data and facts surrounding the approximate 50 mass public shootings in gun free zones over the last 50 years. The conclusive results that I have reached explicably show why mass public shootings take place in gun free zones, identifies possible avenues of action to mitigate mass public shootings, and some of the motives of the mass shooting perpetrators. In light of what has taken place in our country surrounding past and recent mass shootings and the gripping effect it has on our society, the conclusive data and findings will reveal the importance of establishing and taking precautionary steps to identify potential high risk areas that are vulnerable to shootings and mitigate and all together eliminate the future possibility of mass public shootings.

Abusers: The Impact of Past Abuse
Laura Laws, Tiff Jenson (Mentor)

There is considerable evidence that aggression in children is associated with the use of corporal punishment. There is further evidence that in adulthood this aggression can lead to physical violence toward partners or spouses. This article will aim to solidify this association further and distinguish between the use of corporal punishment and abuse. It will further discuss other variables that may be deserving of credit for aiding the association of excessive punishment received as a child and abuse toward a partner as an adult. Using data on 14,252 individuals who participated in the International Dating Violence Study from 2006, this article will aim to explain this relationship.

Correlations of Adverse Childhood Experience and Adult Mood Disorders: Meta-analysis
Micah Brock, Eric Gee (Mentor)

Child abuse and neglect are highly prevalent in the United States. Also, there has been considerable research performed concerning outcomes related with adverse childhood experiences (ACE) including, but not limited to eating disorders, suicidal ideation, homelessness, and use of psychotropic drugs. Previous analysis of these various relationships has been written, however, there has not been a more recent meta-analysis concerning the association between ACE and adult mood disorders. For the purpose of this analysis, data was gathered from research inquiring those correlations published from the year 2000-Present. It is hypothesized that there will be a continued trend throughout the research supporting a negative correlation between the severity of recorded ACE and adult mental health.
How do long work hours result in domestic violence?

Justin Nielsen, Tiff Jenson (Mentor)

The key focus of this study is to discover what kinds of effects may be caused by or related to working more than 40 hours per work week. The information and data that was used for this study came from the Work and Family Life Study [United States] published in 2001 (ICPSR 26641). Since the paper has not yet been completed, all results are preliminary, but it is predicted that working over 40 hours per week increases the chances of the occurrence of domestic violence. If the predictions are found to be correct, this could help people prepare for how to handle the effects that long work hours can have on their bodies and relationships. It should also help couples learn how to improve their relationships where needed, thus preventing things such as domestic violence within the home.

Not with this Partner: Intimate Partner Violence as a Predictor of Abortion Attitude

Amber Patterson, Tiff Jenson (Mentor)

Past research on Intimate Partner Violence (IPV) and abortion has consistently established a link between the occurrence of IPV and women seeking an abortion. While much of this research has focused on motivation and behavior, attitude towards abortion has been left largely unexamined. This study examines the relationship between experiencing IPV and a woman’s attitude towards abortion. This study uses data from the National Couples Study, Wave I (NCS) to examine the impact of IPV on abortion attitude in women age 20 to 35. These data were collected through computer-assisted self interviewing (CASI) between May 2005 and October 2006 through two studies funded by the National Institute of Health (NIH) which examined couples' contraceptive decision making. It is important to study this subject in order to increase understanding of possible factors which shape attitudes towards abortion, which ultimately affect future abortion prevalence and policy.

The Bullying Effect

Camron Hammond, Brooke Mckenna (Mentor)

Gossiping, rumors, threats, lies, pushing, hitting, name calling, and cyber bullying. These are just a few of the things grade school students face from their peers each day at school. Bullying occurs every day and can create serious lasting problems on children. Nationally in grades K-12, one in seven students is either a bully or a victim of bullying. The results of this type of abuse can have long-term effects on a child regarding their social and psychological development. Experts would agree that bullying “consists of unwanted, aggressive behavior among school aged children that involves a real or perceived power imbalance.” However, there are many parents, children, and teachers who are not aware of bullying or do not realize how to help stop the aggression. The purpose of my presentation is to inform on how prevalent bullying is in American schools and raise awareness for this important issue. I’ve had the opportunity to work extensively with a local school district in helping them address bullying problems and have seen firsthand how it effects students. Through this experience I’ve compiled detailed research and feel others will benefit from the ideas conveyed in my presentation.
The Effect of Gun Regulation on Violent Crime

Timothy Patterson, Tiff Jenson (Mentor)

This study focuses on different levels of gun control within society. To analyze this, the study considers the level of regulations regarding firearms for each state, and compares them to the amount of violent crimes that take place. This comparison found a high statistical significance between the level of gun regulations a state has and the level of violent crime per capita of that state. This information uses publicly available information and statistics and clarifies the correlation between them. It may be used to help the general public understand the results and consequences of varying levels of gun regulations.
The Virtual Rehearsal Project - Music Education For Everyone

Jacob Bendixen, Kevin Brower (Mentor)

Online education has become an increasingly powerful form of delivering concepts to students in a variety of situations. Unfortunately, options for music have been limited in practical uses of available technology. The Virtual Rehearsal Project was created as a practical way for music directors, primarily for choirs, to communicate with students at a distance. A number of opportunities can be provided for students including but not limited to: Participation in a choir, music theory lessons, lessons on singing technique, individual feedback, a team experience. To date, two main groups have been introduced to this experience. The BYU-Idaho Men’s Choir currently uses this concept for singing qualification checks for members of the choir. More recently, a group of students in the university’s Pathway Program in Ghana have been participating in rehearsals with the BYU-Idaho Collegiate Singers. In both studies, students were able to both enhance their current musical experience and participate in a way that was never thought to be even possible or available. This project has become and will continued to grow into a viable solution to scarcity in online music education in the choral area.
**A Material World**

Stephen Weatherholtz, Gary Larsen (Mentor)

"A Material World" is a dance about how in the pursuit of happiness, men and women often lose sight of the end goal, and get caught up in "the game" of dating. In any one man's pursuit of a woman, they tend to rely on objects or physical appearance to impress that woman. Any woman may see only these objects, and focus their state of happiness on these gifts or appearances instead of the gentleman's personality or intent. His intent, whether good or bad, is masked by whatever object is presented. In the scriptures this relates to Alma 31:27 which states: "Behold, O God, they cry unto thee, and yet their hearts are swallowed up in their pride. Behold, O God, they cry unto thee with their mouths, while they are puffed up, even to greatness, with the vain things of the world." They cry unto the Lord for happiness, but they are too concerned with worldly things to hear the answer from the Lord. This piece was inspired by the music of Melody Gardot, and relates to many experiences of people in America today. It is a mixture of Jazz, Argentine Tango, and American Tango. The choreographic form chosen for the piece is a narrative parody of a woman and her three suitors.

**BMI**

Bianca Wilde, Gary Larsen (Mentor)

This piece is a modern dance work that researches the effects that society has on the female figure. This piece presents movement based on how the Greeks viewed the female figure (curvy, full, etc) and how our society feels the female figure should be in our day (bony, skinny, etc). This piece takes a stand against modern influence on the female figure and promotes better self confidence for women.
Meaningful Music For A Single Voice: Composing A Work For Solo Trombone.

Jacob Mecham, Darrell Brown (Mentor)

Solo unaccompanied compositions have long been dominated by the keyboard and string families. Keyboard instruments, like the piano and organ, can easily accompany themes with material in opposing hands. Strings can give harmonic context with the use of double stops. The trombone as a solo instrument does not have these advantages. Being only capable of playing one note at a time and also being limited technically by the sluggish slide and harmonic partials, solo unaccompanied literature for trombone has typically been limited to Baroque transcriptions and avant-garde 20th century works. In my piece for unaccompanied trombone, I attempt to create a formally sound work with melody that implies a modern harmony. In my presentation, I will describe the scenario, inspirations, challenges, and solutions into writing this work and conclude with a performance of one of the movements analyzed.

"Argyle" for String Quartet

Alex Isackson, Darrell Brown (Mentor)

"Argyle" is a composition for string quartet written in 2011. The form of the piece is a new invention of mine using different phrase lengths and the 'golden mean.' It is a tonal work that focuses on the natural structure of the harmonic series rather than traditional tonal harmony and chord progressions.

Breathe

Jared Knight, Darrell Brown (Mentor)

"Breathe" is a chamber piece written for baritone voice, oboe, 2 marimbas/3 players, claves, water gong, and rain stick. The droning rhythms and consonant dissonances in the marimbas, the simple ostinato in the claves, and the disorienting timbre of the water gong create an eerie, watery texture over which the oboe and baritone converse. This piece exploits minimalist influences and alternate scale structures, namely Lydian mode and a non-traditional scale that represents a combination of Lydian and Phrygian modes. The middle variations on the main themes, while simple in and of themselves, work together to create a striking contrast that is both surprising yet satisfyingly exotic. The final segment of the music overlays the individual lines of the oboe and baritone, employing simple variations that add interest to the lines independently and to each other as they converse. The dissonances propel the music forward until the end, at which point the marimba sounds a final tonic note. Finishing on only one note adds to the suspended sensation of the music, not truly resolving the dissonant tones of the preceding chord, while still allowing the ear a distinct point of rest. The text depicts a man longing for his loved one. Evident in lines such as “Let go of pain that fills your conscious,” and “Now we are free!” is a history of trauma between the pair. Yet the man's urgent beckon, “Breathe, my love. ... Come to me,” indicates his eagerness to forgive the wrongs done to him and repent of the blows he delivered.
Fela Kuti’s contribution to world music and his growing influence in the US, UK and Europe

Suzette Eises, Mark Watkins (Mentor)

Nigerian musician Fela Kuti has brought a new style of African-orientated music to the US, Europe and the UK and it is currently growing globally due to its originality. Afrobeat is a style of music fused with jazz, funk and traditional African rhythms. It is feel-good, dance music with powerful messages and positivity. Fela moved to London to study music and later decided to move back to Nigeria to pursue his music career. The influence of his parents being highly educated and politically aware led him to involve such issues in his music. He also added his musical influences in London with Jazz and Funk. With traditional African rhythms, he eventually created a style of music very unique to the world that is currently becoming more and more popular now than in his time. Fela played the alto saxophone and spoke about issues in Nigeria in his music. He spoke about the wide gap between the wealthy and the poor introduced by corruption in the country. This is especially present today in many African countries, but many people all over the world can relate to such issues. Even though the topics were heavy, he coated it with horn riffs and fresh grooves that kept you in high spirits. He expressed the pain and struggles of Black people and was also physically abused by people of power, because of his honesty about their behavior. Many are interested in learning more about Africa’s history through a light hearted atmosphere hence why this untold story is receiving attention at present. The piece our band would like to perform was created by a London band named United Vibrations who have been heavily influenced by Afrobeat. In this song ‘My Way’, strong elements of Afrobeat is found. The drum rhythm is evidently traditionally African, the alto saxophone and trombone perform short repeated phrases known as riffs very common in Afrobeat, there are simple lyrics that suggest an idea and upbeat music. Afrobeat will remain timeless and will continue to grow around the world and inspire other musicians to perform this style of music. Music lovers are drawn to its unique qualities and many will seek to understand and learn about it.
Manic-Depressive

Brandon Bennett, Darrell Brown (Mentor)

Mental health care is becoming more prevalent in American culture. Despite the growing acceptance for those with mental disorders, many people still don’t understand what it feels like to live with a mental disorder. When a friend “drops the bomb shell” that they have some mental disorder, many people feel uncomfortable. They don’t know what to say. For people that have a severe lack of understanding, that lack breeds fear. Fear often leads to discrimination. This is a problem that must be addressed. Having an interest in both psychology and music composition, I have felt it a life goal to use each field to aid the other. While research is being done extensively in the field of music therapy, this is not my goal. Instead, I aim to reach those without experience in mental health. Music is an emotional medium and, therefore, an indispensable tool. This composition aims to help people understand, even if just in part, what it means to live with these issues. This piece attempts to demonstrate the feelings associated with bipolar disorder. Historically bipolar disorder was called manic-depressive disorder, and this is reflected in the title. Some of the major misconceptions will be addressed, such as the notion that the mood swings are frequent and numerous in a day. Areas of the piece convey aggravation, sadness and lethargy contrasted with reckless abandon, energy, and heroism. Many famous musical works are quoted for the sense of confidence they embody. The dry, brittle instrumentation lends to the tension of the piece. Please keep in mind that I do not have bipolar disorder or extensive experience with the disorder other than personal research and education. As knowledge is gained through further education and research, musical ideas and psychological principles will be expanded and improved. This project is just the beginning of research and creative output along this vein. It will culminate in a large multi-movement work about psychological disorders.

Now My Heart Sings

Victoria Loveland, Caryn Esplin (Mentor)

Mary Anthony Thomas was 13 years old when she and her friends heard that the missionaries had come to her area. The girls hid rocks in their aprons to throw at “the Mormons”. When they arrived the missionaries were singing a hymn. She started singing with them. The missionaries knelt to pray and she knelt with them. Her friends tried to get her to throw the rocks, but she was changed. She was baptized and endured extreme hardship including persecution from her parents. She met a virtuous, faithful man named Thomas Samuel Thomas on the Journey to Zion. “Now my heart sings” is a premier piece for a musical about the Mormon Battalion that I am in the process of composing. It contains both a narration and a song to be performed together. It features a Tenor and Bass duet representing the missionaries and is based on the life and conversion of Mary Anthony Thomas. The total performance time is approximately eight minutes.
Tom-A-Round: Composer - Shane Steve

Shane Stever, Darrell Brown (Mentor)

Tom-A-Round is a conception piece based on shape and pattern. It requires a specific organization and tuning of the drums and instruments used in order to achieve the desired visual and aural effects. With eight players, each player has two toms (or in the case of one player, a tom and a bass drum) and an auxiliary percussion instrument. The fifteen toms are set up in a spiral shape and are placed and tuned lowest to highest coming from the bass drum. The music itself features several themes. It starts out with a fairly simple accent pattern introduced by player number one. Two and three join him/her, splitting the beat between their toms. The piece continues as all players come in and split the same accent pattern. When played correctly, it should be obvious to the audience that the same pattern is present. More themes are introduced throughout the piece, but all are directed back to the ideas of both of the original accent pattern as well as descending and ascending pitches placed around the circle. A soft section of the piece introduces the auxiliary instruments. They include the following: Wood block, Splash Cymbal, Ride Cymbal, Crash Cymbal, Tambourine, Shaker, Snare Drum, Brake drum, and Cowbell. Each player gets their turn to lightly play his or hers and add to the color of the music. The music progresses more and as the various instrument combinations come alive, all the timbers of the instruments are explored and are mixed in with the previous patterns to present the climax of the piece. The piece mellows back down, and as it does, it brings one more element. Yet this element is not as much music to the ears as it is a mind game for the eyes. The players take their turns adding to the original accent pattern, but it slowly dissipates into silence. The trick is that the players are still miming the notes. Finally, the players hit a big note together and, with a flourish, bring the piece to a close.

“The Death of Autumn”

Alicia Hansen, Darrell Brown (Mentor)

“The Death of Autumn,” a composition written and arranged for Symphonic Band, began as an enigmatic, frustrating, and incomplete collection of ideas that were thrown together as a sort of makeshift piano solo. The melody was the only constant, the only anchor. It slowly developed into a fully orchestrated piece for band as I realized that it wasn’t living to its full potential in the confines of the 88 black and white piano keys. Now it lives fully, arranged for Symphonic band. The piece initially was entitled “Wind Under the Wing.” That title, however, never sounded quite right. Finally the concept behind the final title settled in. “The Death of Autumn” depicts aurally the transition from the annual season of Autumn to Winter. The oboe solo that begins and ends the piece is a musical representation of the last leaf falling from the tree as Autumn succumbs to Winter’s imminent victory. The brilliancy of Autumn’s colors and vivacious traditions fades into a subtle and accepting invitation for Winter to take its place in the year. This piece was first written several years ago when I was in the 8th grade. Its journey in becoming a band arrangement was long but rewarding. Now I am studying Music Composition and consider this piece to be a large part of the musical springboard that has launched me into realizing my love of music and musical composition.
Sustition

Robert Sears, Ryan Nielsen (Mentor)

Sustition is jazz composition based on opposition. Opposition in this case being the establishment of a musical expectation, be it through a repetitive musical idea, form, structure, etc. and then dashing that expectation through certain alterations. This work contains two opposing dances: Brazilian Samba and Disco. Found within the Brazilian Samba is a relaxed and laid back dance that is propelled by strong harmonic movement. The Disco sections, in contrast, contain a driving straight eighth groove that is accompanied by a simple two chord harmony. The title Sustition is a combination of two words: opposition and suspended chords (a musical harmony utilized in the disco sections).
"Be Not Afeard: The Isle is Full of Noises"

Aimee Phillips, Antonia Clifford (Mentor)

William Shakespeare is known for having a way with words, but it seems that he also had an ear for the sounds in the worlds of his plays. He uses such phrases as “Hiss me into madness,” “A thousand twangling instruments,” and “He’s composed of harshness.” This semester, the Department of Theatre chose to perform Shakespeare’s retirement piece, The Tempest. It was my privilege to be the Associate Sound Designer alongside my faculty mentor, Antonia Clifford. Our director had a vision to bring the Shakespearean language into a modern time period. What would magic sound like in an age of computers, iPods, and smart-phones? What underscoring would hint at the modern trends without going into dubstep, techno, or One Direction? And what do you do when the director throws a curveball into your design concept? Well, you play everything by ear (no pun intended).

After six months of hard work, Sister Clifford and I had a sound design that underscored the entire play save for six moments of purposeful silence. I would like to describe the process behind such an intense project and why sound was such an essential part of this production.

Time Stops

Haley Reese, Brooke McKenna (Mentor)

I am a Visual Communications major and I’m very interested in film and photography. Naturally the first thing that I wanted to do is combine the two mediums. I discovered Time lapse photography. Time lapse photography is basically a bunch of still photographs put together to create a move. Film uses the same concept but usually it uses a higher frame rate. Time lapse gives everything a very old and a creeping feel as opposed to film that runs relatively smooth. The project presents different time kinds of time lapse photography over Rexburg, ID. This is a compilation of what makes Rexburg, ID beautiful. Sometimes in the cold rough conditions we forget that there is some beauty underneath. Time lapse can be an art form much like a painting, Time lapse photography is rarely presented as an art form so it will be interesting to try to present it as such. In my presentation I will address different kinds of time lapse techniques that can be used. Also I will present some tips when shooting time lapse video. This is meant to inspire people to go out and try to shoot some time lapse photography for themselves. My overall goal is to encourage and inspire others to be creative with the equipment that they have available to them.
"Why Do I Love You?" from the musical "Loose Change"

Kameron Kavanaugh, Brandon Bennett, Daniel Kerr (Mentor)

The musical theater sound has changed over time. It has become heavily influenced by pop music while still keeping the same musical theater sound that many have come to recognize and love. In efforts to capture the essence of a more classical, operetta Broadway sound, I have started a project of writing a musical. Along with Brandon Bennett, a fellow music student, we have coined the title "Loose Change." The show aims to target a few of the issues we see in today's society and create characters that represent each of those ills. One character, the Old Man, who represents each characters' conscience and appears in several environments throughout the show. His goal is to get the characters to reform their lives and do the things that will be more valuable than "Loose Change" in their pockets. Two of the characters in the show, Ian and Amanda, are a married couple who are being stretched to the breaking point in their marriage. They don't have the knowledge to fix it and at times even question their own desire to do so. At a critical moment in the show, they sing a distant duet "Why Do I Love You?" This song portrays each of them expressing what they feel the issue is and why they are so frustrated. Through each personal soliloquy, they slowly come to the realization of what they can do to make things better. They make a resolution to do what they must, because they remember that they still love each other. The duet was performed by Adam and Nykele Shapiro with Allison Vest accompanying on the piano. Dr. Daniel Kerr gave helpful feedback on several of the pieces from the show and has shown his support for the completion of the project.
Enchant"mint": A fashion line that is elegant and refreshingly modest.

Maria Warwood, Kari Hardy (Mentor)

The concept of a modest dress that is beautiful is inspiring. It can spark a light in your heart and that is how it was with me. I was given the opportunity to create a line of clothing. What was I to design? Many ideas flittered through my mind and one stood out. Elegant dresses that were modest. Ones that catch your eye, that whispered to you, "Wear me." The process began: inspiration gathered, sketches drawn, advice given, and choices made. I choose five dresses. Each unique yet related by common principles. The popular natural waist, flattering half sleeves, lovely boat necks, thinning belts, a modest length, and the stylish color "mint". I started the pattern work for each design. I drew upon the knowledge I had been taught. Some patterns came easily but others took more thought. I often turned to mentors and more importantly the Lord. Inspiration flowed so often and left me with a heart full of gratitude. At this time the search for right fabrics started. Store after store was visited and finally the perfect materials were found. It brought so much excitement! Once patterns were completed the actually sewing started. Well first came the cutting out and marking and prepping, but all a part of sewing. Dress after dress came to life. Then they were all complete, ready to bring refreshing modesty to the runway. It was time for the fashion world to be inspired.

END OF LINE: Creating a fashion line from beginning to the runway

Trenton Evans, Kari Hardy (Mentor)

END OF LINE is a clothing line of casual street jackets designed by Trenton Evans drawing heavy influence from sci-fi mediums. Under class direction of Sister Jolene Smith and expanded to its current state, END OF LINE consists of seven designed and constructed jackets. The presentation will consist of how a fashion line is planned, designed, constructed and then shown for the first time in a runway setting. Before anything begins, inspiration and planning boards are used to guide the designer to stay with design themes to maintain unity between all design pieces. Sketching takes place to create clothing designs that all relate to each other in at least 12 ways. Once completed, pattern making take 3D designs and convert them into a 2D medium capable of being transferred to fabric. Once fabric is cut out construction begins. END OF LINE specializes on utilizing reenforced corners to create jagged edges on the article, a difficult sewing technique. After 350+ hours of work, the clothing line is ready to be shown before the public on the runway. END OF LINE was shown at BYU-Idaho's Showcase Runway on December 10, 2011. Designing these types of lines is vital to securing a job by building up a credible portfolio to show to potential employers. Through building and enhancing these skills Trenton is not only preparing for a future as a designer, but also launching his fashion career while still at BYU-Idaho.
Experience: Art
Dustin Landon, Scott Franson (Mentor)

My project is a result of research that showed some startling problems with how the average person views art. Many people don't feel like they are smart enough to appreciate fine art, while others are put off by the pseudo-intellectuals floating about art galleries. Most people have a small idea of what the big world of art really encompasses and they don't know how to truly experience art. Many individuals will simply look at a painting or photo and judge it on the style, never looking for the experience the artist intended. To resolve these issues, I have built an interactive “app” (for lack of a better word) that utilizes the Microsoft Kinect technology and some customized software. My app will turn a seven foot-wide projected screen into an interactive touch screen to provide the user with an immersive and educational experience.

Illustration Portfolio
Austin Shurtliff, Dan Burr (Mentor)

Illustration tells a story using visual elements. Through my study of illustration, I have learned to use many of the elements and principles of design to tell stories. However, there is more to art than simply using design well. Through art, the artist is able to learn and express a little bit about himself. One of the ways that an artist personifies himself in his work is through his style. Style is not simply subject matter, medium, or even the final look; it goes deeper than that. It is created as the artist leaves a part of himself in each mark on the page. As I have built my portfolio, I have tried to find my style. My portfolio is a summary of what I have learned about art and myself.

Mission Compleat: A Fashion Line
Tessa Smith, Kari Hardy (Mentor)

My fashion line includes a collection of five coats that are all inspired by WWI British Military Jackets as well as the Beatles from the Sergeant Pepper Era. They are all original designs and all the pattern work and construction of them was done by me. All the coats are made out of wool and fully lined. The project was done for my capstone design class for my apparel design concentration. This line is really a culmination of everything I have learned out of my fashion design and construction courses. I feel like it is my best work and would love the opportunity to show it to others.

ROTC Flyer’s using Principles and Elements of Design
Brian Robertson, Kory Godfrey (Mentor)

My final project, for my major is based on creating affective media to aid in the recruitment of future military personnel within the ROTC. My approach with this graphic design project is to use the skills gained, and apply them into building websites with greater visual impact in relation to the mission of the ROTC. I have learned the principles and elements of design used are the same for paper as well as computer based design. With small amount of advertising the ROTC does campus, my goal is to create strong, visually appealing ads that will be used as future recruitment tools. As people see the flyers, the goal is to get them interested in what they can obtain, and the benefits of serving their country. The effectiveness will give them the motivation to go and talk with the ROTC department for more information.
Time Travel

Ariel LaFontaine

As a certified Makeup Artist, I decided to put a twist on my color photo class final project by using my readily available self as the only readily available subject. This gave me the freedom to implement my love of playing dress up and enamor with ideas of time travel into a series where I could visually gauge how each designing factor affected my own face shape and overall presence. Inspired in part by Kevin Aucoin’s flawless work in his book Face Forward, and my own wishes to live various lives in bygone eras, I present to you a simple look at myself, Ariel LaFontaine, through the ages.

When Do Filmmakers Subscribe

Jared McKinney, Lane Williams (Mentor)

The idea for our research came from Logan, one of our group members. He’s creating a website that delivers educational tutorials for videographers. We’re familiar with the business models of Pandora and Spotify music services. These services use a free version as well as a paid monthly subscription. We would like to know at what point students or consumers in general are willing to pay for a monthly subscription.