

Apr 24th, 8:30 AM - Apr 25th, 2:00 PM

2006 Abstract Booklet

Undergraduate Research Center, Minnesota State University, Mankato

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Undergraduate Research Conference

2006
URC



MINNESOTA STATE
UNIVERSITY
MANKATO

April 24 & 25, 2006

URC PRESENTATION AWARDS

The purpose of judging and awarding is to recognize and promote high-quality research and creative activity. Within each oral or poster session, two judges independently rank each presentation, and the mean rank is the final rank. The best presentation in each session receives a "Best Presentation" certificate and a Barnes and Nobel Bookstore gift certificate to be presented at the URC luncheon. Judging of oral presentations is based on delivery and content. Posters are judged while presenters are attending and judges speak with presenters to identify the winner. Judges are graduate students, faculty, or graduate faculty. Judges for each session are identified by the URC Steering Committee. Winners are recognized in the URC online journal.

<http://www.mnsu.edu/research/URC/OnlinePublications/onlinejournal.htm>

URC SPECIAL THANKS

Richard Davenport – President

Scott Olson – Vice-President of Academic Affairs

Fernando Delgado – Dean College of Graduate Studies and Research

Susan Kuyper – Director College of Graduate Studies and Research

Marilyn Hart – Chairman of the Undergraduate Research Conference

Jody Barney – Graduate Assistant of the Undergraduate Research Conference

Moderators and Judges

Minnesota State Foundation – for their generous support of student research

Undergraduate Research Conference Committee Members: Marilyn Hart (Chairman), Dawn Albertson, Rebecca Bates, Barb Bergman, Kathleen Blue, Michelle Carter, Beth Handler, Rajiv Kapadia, Andi Lassiter, Vicki Luoma, Kristel Lynch, Mark McCullough, Linda Underwood, Trent Vorlicek and Gina Wenger

Invited Luncheon Speaker: Molly Spartz, Minnesota State Foundation Student Research Award recipient

Portions of this program are made possible through contributions from:

Department of Biological Sciences, Barnes and Nobel Bookstore, Hickory Tech and the Organizational Effectiveness Research Group

**Abstracts were written by the project facilitator and reviewed by faculty mentors. Any opinions expressed do not represent those of the URC Steering Committee or Minnesota State University, Mankato.*

Monday, April 24 Schedule of Events

8:30 - 4:30	Student Presenter, Moderator and Judge Check-in	CSU Ballroom Entrance
8:30 - 5:30	Site Judges Gathering Room Open	CSU-244
8:45-10:15	Session A- Psychology, Social Work, and Speech Communication	CSU-201
8:45-10:15	Session B- Business and Economics	CSU-253
10:15-11:00	Coffee Break	CSU Ballroom
10:30-12:30	Poster Session A	North Ballroom
10:30-12:30	Session C- Art and Mass Communications	CSU-284
10:30-12:00	Session D- Biological Sciences and Chemistry	CSU-253
12:30-1:15	Lunch (on your own)	
1:30-3:30	Poster Session B	North Ballroom
1:30-3:30	Poster Session C	North Ballroom
1:30-3:00	Session E- Engineering	CSU-284
1:30-3:00	Session F- Speech Communication	CSU-204
3:15-5:00	Session G- English	CSU-285
3:15-4:45	Session H- Business	CSU-201
3:15-5:00	Session I- History, Anthropology, Sociology, and Philosophy	CSU-284

Tuesday, April 25 Schedule of Events

8:30-11:30	Presenter Check-in	CSU Ballroom
8:30 - 12:30	Site Judges Gathering Room Open	CSU-244
8:45-10:15	Session J- History, Anthropology, Sociology, Political Science, and Humanities	CSU-253
8:45-10:15	Session K- Business	CSU-255
9:30-12:00	Session L- Women Studies	CSU-284
10:00-12:00	Poster Session D	North Ballroom
10:00-12:00	Poster Session E	North Ballroom
10:30-12:00	Session M- Physics and Geography	CSU-201
10:30-11:30	Session N- Computer Information Systems	CSU 253
12:00-1:00	URC Luncheon and Award Ceremony	Center Ballroom

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Monday, April 24 Presenters

8:45 - 10:15 A.M.

Session A

CSU-201

Session A - Psychology, Social Work, and Speech Communication

Moderator: Dr. Vinai Norasakkunkit

Becca Van Otterloo, Katie Griep and Katie Hall (B. Nandy) *Self-Examination Of Elders Who Have Transitioned Into An Assisted-Living Facility: A Pilot Study*

Elizabeth Harsma (V. Norasakkunkit) *Ethnic Identity And Self Esteem: The Moderating Effect Of Self-Structure*

Cheryl Kaberle and Virginia Neal (C. Black-Hughes) *Analysis of the Nicollet County Law Enforcement, Court Services and Community Corrections Revenue and Expenditures: A Five Year Review*

Julie Lemley (J. Dimock) *The Basis Of Self And Other In Gender Constucted Identity*

Lindsey Thompson (J. Dimock) *The Pseudo-Event Of Charitable Work: Uncovering Walmart's Hidden Agenda*

Emily Kofoed (L. White) *Oxytocin: The Trust Hormone*

SELF-EXAMINATION OF ELDERS WHO HAVE TRANSITIONED INTO AN ASSISTED-LIVING FACILITY: A PILOT STUDY

Becca Van Otterloo (Psychology)

Katie Griep (Sociology)

Katie Hall (Health Science)

Bikash Nandy, Faculty Mentor (Health Science)

As the elderly population increases, more assisted-living facilities will be in place to accommodate the elderly who need more assistance. Many changes occur during the transition period, thus more studies need to be done on assisted-living facilities and how the residents have transitioned. The findings from the studies can then aide future residents during their transition period. The transition period from living independently or with family to a more structured living style, much like an assisted-living facility, can be very stressful. As a result, 10 older adults age 65+ were interviewed one-on-one about their transition from living independently to living in an assisted living facility. Results show reasons why residents are in an assisted-living facility and what has aided them the most throughout their transition. Also, how the residents dealt with the changes during their transition and their advice for future residents.

ETHNIC IDENTITY AND SELF-ESTEEM: THE MODERATING EFFECT OF SELF-STRUCTURE

Elizabeth A. Harsma (Psychology)

Vinai Norasakkunkit, Faculty Mentor (Psychology)

Previous studies examining the predictive relationship between ethnic identity and self-esteem among Hispanic/Latino populations have revealed that in some cases, higher levels of ethnic identity have been associated with higher self-esteem, while in other cases, this relationship has been weak or non-existent. This study attempts to explain this inconsistency by examining the relationship between self-esteem and ethnic identity in Hispanic/Latino populations from a cross-cultural perspective, taking into account cultural models of self-structures. These culturally divergent self-structures have been established and well documented by cross-cultural studies between Eastern and Western cultures. Many Hispanic/Latino subgroups share cultural systems that emphasize the interdependent and collectivistic qualities that are found in many Eastern cultures. It follows that Hispanic/Latino culture may also share other implicit characteristics with Eastern cultures, including a more interdependent self-structure. For such a self-structure, both self-esteem and ethnic identity may be conceptualized differently than they are for an individualistic or independent self-structure. Thus, by including a measure of self-structure in the current study, it is expected that there will be an association between ethnic identity and self-esteem when the self-structure is more independent but not when the self-structure is more interdependent.

ANALYSIS OF THE NICOLLET COUNTY LAW ENFORCEMENT, COURT SERVICES AND COMMUNITY CORRECTIONS REVENUE AND EXPENDITURES: A FIVE YEAR REVIEW

Cheryl Kaberle (Social Work)

Virginia Neal (Social Work)

Dr. Christine Black-Hughes, Faculty Member (Social Work)

The purpose of this research project is to respond to a request from the Nicollet County Criminal Research Committee (NCCRC). NCCRC is in the process of developing a county wide plan for the prevention, intervention, treatment, prosecution, defense and incarceration of criminal offenses. The NCCRC must have data that reflects past and current expenditures and revenues for Law Enforcement, Court Services and Community Corrections. The NCCRC determined that this analysis would occur from January 2000 to August 2005. By analyzing past trends, the NCCRC will be able to synthesize this data into a workable plan for the county. This presentation will compare national trends to the local expenditures, an evaluation of direct and indirect expenditures.

THE BASIS OF SELF AND OTHER IN GENDER CONSTRUCTED IDENTITY

Julie L. Lemley (English and Speech Communication)

James Dimock, Faculty Member (Speech Communication)

This paper is an extension of previous research projects wherein I applied theories of identity and labeling (Garfinkle), power (French and Raven) and gender (Pearson, West and Turner) to adolescent girls' identity construction. Using methods of textual criticism, I argued then that the advertising targeting adolescent girls at the crucial transitional period between child identity and adult identity were dominated by patriarchal imagery, the implications of which are sexual violence, low-self esteem and self-objectification by young women.

This paper applies the same methodology but to identity formation of adolescent boys, arguing on the basis of Hegel's master-slave dialectic that adolescent girls' construction of "self-as-object" does not reinforce the patriarchal norm unless there is a complementing identity construction among adolescent boys of "self-as-subject" in relation to "other-as-object." As in the first study, this case looks at advertising targeting adolescents.

THE PSEUDO-EVENT OF CHARITABLE WORK: UNCOVERING WAL-MART'S HIDDEN AGENDA

Lindsey Thompson (Speech Communication)

James Dimock, Faculty Mentor (Speech Communication)

On August 29, Hurricane Katrina slammed into Mississippi and Louisiana. But during the following days, the human, social and economic damage of Katrina was overshadowed by another story. The story of Katrina became a story about the failure of trusted safeguards, about bureaucratic red tape and about crisis in leadership. But this story, too, had its heroes and perhaps the most unlikely hero - ever - was one of the most hated corporations in America: Wal-Mart. While FEMA stalled, Wal-Mart responded. However, Wal-Mart is not as heroic as they would like us to believe, and we as consumers of not only merchandise, but also the media need to be educated as to the many ways corporations use the media to manipulate our wallets, our hearts, and our minds.

Analysis of Wal-Mart's relief efforts begins with David Boorstin's theory of the 'pseudo-event' as developed in his 1961 text *Images*. Boorstin's theory provides a method of analysis, which distinguishes between news and public relations stunts. This method offers a framework from which Wal-Mart's relief efforts can be analyzed as a PR event.

OXYTOCIN: THE TRUST HORMONE

Emily Kofoed (Speech Communication)

Leah White, Faculty Mentor (Speech Communication)

A recent study revealed that oxytocin, a hormone well known for inducing labor and lactation, also increases trust. Oxytocin has positive implications on personal, social and global levels. However, use of the hormone for trust purposes is not without its ramifications. Many misunderstand the results of the oxytocin research and plan to use the hormone for manipulative purposes. By looking at the potential applications of oxytocin and comparing them to the negative implications that have arisen from this research we can gain a better understanding of this hormone and the way it may affect our future interactions.

Session B - Business and Economics

Moderator: Dr. Queen E. Booker

Amber Hubbard (R. Zelin) *Fraud Forecast: Hot and Rising*

Timothy Juliar (R. Zelin) *Cost Of Implementing Open-Source Software*

Kirk Overaas and Jolene Sieben (T. Olach) *Sarbanes-Oxley, Investigating The Perceived Knowledge And Effectiveness Of Financial Statement Fraud Penalties*

Ross Milbrett (T. Olach) *Perceived Fairness Of New Penalties Under, Sarbanes Oxley*

Tyler Goodmanson, Brett Fleck, and Emily Johnson (V. Luoma) *Assesment Of The Mankato Area's Young Adult Population's Knowledge Of Mall Video Mining For Marketing Research*

FRAUD FORECAST: HOT AND RISING

Amber A. Hubbard (Accounting and Business Law)

Dr. Robert Zelin, Faculty Mentor (Accounting and Business Law)

Fraud has become one of the biggest concerns among companies and businesses today. One single case of fraud may end up costing a company over millions of dollars, hurt the company's reputation, and even put a company out of business. One survey that has tried to get a grasp on how big of a problem fraud really is among U.S. companies is the KPMG Fraud Survey of 2003. The study surveyed 450 executives in medium to large companies (250 million in revenue per year or more). Seventy-five percent of those companies revealed that they had experienced fraud within the last twelve months. Not only is fraud within companies on the rise, but the cost of fraud has been steadily increasing as well. The KPMG survey revealed that although financial reporting fraud was the least occurring (only 7%) it is the most expensive fraud with an average cost of \$250 million or more. Since the KPMG Fraud Survey of 2003 only includes medium to large companies and does not address geographical regions, my study will address the extent to which fraud is a problem in smaller companies as well as the extent to which fraud is a problem in Minnesota. I will compare my results with those of the KPMG Fraud Survey of 2003.

COSTS OF IMPLEMENTING OPEN-SOURCE SOFTWARE

Timothy Juliar (Accounting)

Dr. Robert Zelin (Accounting)

Open-source software development has allowed for continuous improvement by allowing anyone to view the source code of programs, make improvements, and release the results. This has created a worldwide community of developers who create programs rivaling those of large corporations. The cost, in most cases, is nothing and available to download free from the Internet. Businesses have started to implement open-source software in their information systems, but many businesses remain reluctant to change to open-source because of problems involving security, support, and compatibility. There are many advantages of open-source software but careful analysis of costs associated with conversion, training, and security problems must be performed. Commercial software also has its benefits such as support, security patches, and compatibility but is expensive to license. In my presentation, I will compare the quantitative costs of switching from commercial software to open-source software and the long-term costs associated with the switch.

SARBANES-OXLEY, INVESTIGATING THE PERCEIVED KNOWLEDGE AND EFFECTIVENESS OF FINANCIAL STATEMENT FRAUD PENALTIES

Kirk Overaas (Accounting)

Jolene Sieben (Accounting)

Tom Olach, Faculty Mentor (Accounting)

The recent boom in financial statement frauds has led market participants to lose confidence in the accounting regulatory system. This dilemma gave rise to the Sarbanes-Oxley (SOX) Act signed on July 30, 2002. SOX revised penalties regarding financial statement fraud, making regulations stricter. Currently, little research exists that provides individuals with information pertaining to the public's knowledge of the SOX penalties and the penalties' effectiveness in mitigating fraudulent financial reporting. Companies are experiencing significant costs associated with SOX compliance, so analysis is worthwhile in order to assess the effectiveness of the current SOX penalties. This research will help determine if the benefits of SOX penalties are worth the additional costs companies are currently experiencing. Three groups of individuals will be surveyed: (1) accounting students, (2) College of Business faculty, and (3) accounting professionals, to determine the public's knowledge and opinion relating to the effectiveness of these penalties. This research has public policy implications because the results will help inform accounting/auditing regulators of three things: (1) Is the public aware of the current SOX penalties? (2) Do the benefits of the penalties exceed the additional costs? (3) Does the public feel that the new SOX penalties will alleviate fraudulent financial reporting? Results from this study will illustrate the public's awareness of SOX and the perceived effectiveness of SOX financial statement fraud penalties.

SARBANES-OXLEY, THE PERCEIVED FAIRNESS OF NEW PENALTIES UNDER SARBANES OXLEY

Ross Milbrett (Accounting)

Tom Olach, Faculty Mentor (Accounting)

This research project evaluates the perceived fairness of the new penalties under the Sarbanes Oxley (SOX) Act signed on July 30, 2002. All companies registered with the Securities and Exchange Commission are subject to these new penalties. To measure the perceived fairness of the new penalties, surveys will be administered to 100 undergraduate accounting students enrolled in accounting principles classes. The results of this research will help accounting regulators determine if penalties are too harsh under the new Act. If so, accounting regulators may want to choose an alternative remedy to mitigate fraudulent financial reporting.

ASSESSMENT OF THE MANKATO AREA'S YOUNG ADULT POULATION'S KNOWLEDGE OF MALL VIDEO MINING FOR MARKETING RESEARCH

Tyler S. Goodmanson (Marketing)

Brett E. Fleck (Marketing)

Emily A. Johnson (Marketing)

Vicki Luoma, Faculty Member (Business Law)

The most modern form of gathering marketing information is not as new as many people believe. The trepidation of Big Brother's cameras watching down on us puts a chill down most peoples' backs. In numerous mall stores, cameras are located in each store and are examining you. Most believe that the cameras are positioned for the purpose of shoplifting and crime, but the truth is many are also used for the purpose of marketing.

Video mining as it is known has emerged as the latest method of conducting market research. The stores that are participating in this study are diligently watching an assortment of things. Marketing analysts watch what a customer has picked up, what they have looked at, the amount purchased, colors that attract them, their facial expressions, and many other forms of movement. This information is gathered and recorded, then shot across the nation via computer to a company such as Shopper Trak that views and analyzes clips of customers shopping. Shopper Trak presently has 40,000 cameras in various stores across the nation. Most customers have little knowledge of this marketing tactic or that there are no laws prohibiting this action.

Do stores and business's have an ethical duty to reveal their practices to their customers? Is it legal for them to use the personal information or preferences of their customers to exploit them without their knowledge or consent? Finally, where is the line drawn on what is considered personal, private information?

Session C - Art and Mass Communications

Moderator: Dr. Elizabeth Miller

Jana Griesenbrock (A. Eimen) *The Use of Calligraphy in Modern Islamic Art and its Ties to the Past*

Eliza Koch (E. Kawabata) *Japan And The U.S.: Two Free Nations, Two Versions Of Free Press*

Jill Fredrickson (E. Miller) *Drawing The Figure Using References For An Online Comic*

Molly Spartz (G. Wenger) *Shirin Neshat Project*

Art Johnson (M. Laidlaw) *The Slip-Casting Process And Recent Multi-Media Art*

Jarrold Feddersen and Anna Melzer (R. Mingeva) *Contrafusion - A Creative Investigation of Gender in Art*

ARABIC CALLIGRAPHY IN MODERN ISLAMIC ART AND ITS TIES TO THE PAST

Jana Griesenbrock (Art History)

Alisa Eimen, Faculty Mentor (Art History)

Calligraphy, an art form that has been rooted to the very beginnings of Islam, started with the copying of the holy book, the Qur'an. My studies revolved around how text has evolved and been integrated into the modern Islamic art world, from its roots in the seventh century through today. Since the events of September 11th, 2001, radical factions of Islam have captured media attention and the imagination of the public. This project was aimed at offering another view from an art historical perspective. I have analyzed the work of artists from Islamic countries alongside several working in the United States. Some artists that I have studied include Siah Armajani, Jamil Hamoudi and Hossein Zenderoudi. In the nineteenth century the colonization of the Islamic world took place, occurring over several decades. Alongside colonization, an interest from westerners of things foreign, exotic, and from the east arose, which in turn, had a profound effect on the creation process of Islamic art. I discovered a desire by artists to relate to one common and still relevant art form. Calligraphy offered a uniquely enduring art form that modern artists have creatively integrated into painting and sculpture. The purpose of this project was to add to the already existing information available on modern Islamic art, a field that has been understudied in the discipline of art history.

JAPAN AND THE U.S.: TWO FREE NATIONS, TWO VERSIONS OF FREE PRESS

Eliza Koch (Mass Communications)

Eiji Kawabata, Faculty Mentor (Political Science)

The media are important in a democracy; they provide a means of communication between the government and its constituents. They also serve as a fourth branch to check the country's government. Although these two nations have different histories there are many similarities in the media systems. This presentation examines the media and politics in two separate democratic nations, Japan and the United States. Despite their different historical and cultural backgrounds, they have similarities. Both nations have free press, but there are cases when both governmental systems have attempted to censor their media in one form or another. This presentation delves into the differences as well, for instance the Japanese system is more exclusive than the United States'. While analyzing the similar and diverse aspects of the media systems the presentation touches on the benefits and the disadvantages of both systems. Through these analyses, the presentation illuminates the fundamental relationship between the media and democracy.

DRAWING THE FIGURE USING REFERENCES FOR AN ONLINE COMIC

Jill Fredrickson (Art)

Liz Miller, Faculty Mentor (Art)

An accurate enactment of a comic story requires accurate drawing of the human figure's poses, emotions, and perspective. A two-year drawing research investigation, during which I created the comic *The Planet Closest To Heaven*, has allowed me to reflect on the most effective use of references. Real people were used as models, along with other styles of drawing and other references that included mirrors, photos, and books. I have discovered that using a variety of references conveys the many different situational moods of comic book story telling. The complete project is made up of pencil drawing, inking, charcoal, computer media and printing, resulting in a printed graphic novel.

SHIRIN NESHAT PROJECT

Molly Spartz (Art Education)

Gina Wenger, Faculty Mentor (Art Education)

My research involves the artist Shirin Neshat, a contemporary Iranian performance artist. In order to create a secondary art curriculum on her work, I viewed exhibit of her work, research her background, and test taught what I thought would be appropriate student lessons. Neshat's work deals with Islam's gender divide. My intention was to create an opportunity for encourage students to reflect on the multiple identities of Islam. Her work doesn't condemn or glorify Islam, but challenges it's viewers to rethink their perceptions of Islam. She does this by using photography and cinema. Shirin Neshat is a 43 year-old-artist that was born and raised in Iran but moved to the U.S. after high school to study art. After the Revolution took over her homeland she could not return for 11 years. When she did go back home, it had little resemblance of what it had been at one time. Her general theme is to cause awareness. I find myself feeling passionate and hopeful about this artist and the message she shares from her personal insights. For my research I created a senior high curriculum that not only teaches about Shirin Neshat, but also allows students to produce artworks based on their experiences.

THE SLIP-CASTING PROCESS AND RECENT MULTI-MEDIA ART

Art Johnson (Art)

Mika Negishi Laidlaw, Faculty Mentor (Art)

Technique and process are the framework upon which all aesthetic expressions in Art are hung. An Artist is restricted by the physical limits of the medium and processes by which he/she manipulate that medium. The particular processes that I am exploring are slip-cast ceramics and audio/video art. Since being awarded the URC Grant I have been able to purchase a slip pump for use with slip-casting and also small video cameras. These acquisitions have changed the processes that I work with, which I will demonstrate and/or illustrate through digital images recording the processes. This presentation will show how the techniques allowed by the new equipment acquired through the URC Grant have shaped the work that it was used with, as well as the an overview of the my general aesthetic trajectory.

CONTRAFUSION: A CREATIVE INVESTIGATION OF GENDER IN ART

Jarrold Feddersen (Art)

Anna Melzer (Art)

Rea Mingeva, Faculty Mentor (Art)

Issues of gender are being addressed across the nation. In nearly every case, these gender issues are discussed from a myopic point of view or by taking a viewpoint that is based upon opposition. By examining individual idiosyncrasies as well as socially-imbedded myths and truths, "Contrafusion" tested the responsibilities each person faces in art and in life. The investigation challenged the ego associated with individuality and the humility required in a partnership of opposites. "Contrafusion" revealed the extraordinary opportunities such a collaboration offered to establish a broader base of understanding and mutual respect rather than an unrelenting battle for the highest position.

Session D - Biological Sciences and Chemistry

Moderator: Dr. Penny Knoblich

Kayla Knudsen (B. Cook) *Are European Journals More Likely To Publish Positive CAM Trials Than American Journals*

Cassandra Borg and Chris Schmitz (P. Knoblich) *The Effect of Chronic Exercise on Vascular and Kidney Responses in the Spontaneously Hypertensive Rat*

Elizabeth Drommerhausen (B. Klosa) *Renewable Energy From The Oceans, The Ocean Thermal Energy Conversion System (OTEC)*

Michael Burns and Cassidy Punt (J. Rife and T. Salerno) *Initial Comparison of DNA Sequence Variation Between a 5-SNP Cluster On the Y-Chromosome and an SNP-rich Rregion of the Mitochondrial DNA*

Sunnie McCalla (J. Krenz) *Determination Of Genetic Diversity of River Otter Populations In Minnesota*

Kelly Rock (T. Secott) *Effect of Conditioned Medium on the Recovery of Dormant Mycobacteria in Culture*

ARE EUROPEAN JOURNALS MORE LIKELY TO PUBLISH POSITIVE CAM TRIALS THAN AMERICAN JOURNALS?

Kayla L. Knudsen (Biological Sciences)

Bradley J. Cook, Faculty Mentor (Biological Sciences)

The objective of this study was to assess the presence of publication bias in clinical trials involving complementary and alternative medicine treatments published in the highest impact factor European and US journals. All clinical trails with complementary medicine treatments published in the 4 highest impact factor general medicine journals were abstracted using Medline (PubMed). The search was performed using the 'Journals database' in PubMed. Three reviewers abstracted data from the individual articles using the abstract and full text of the studies. Univariate and multivariate logistic regression analyses were preformed using outcome of the study (positive or negative) as the dependent variable and country of journal, randomization, blinding, sample size, CAM intervention and duration of follow up as the predictor variables. A total of 705 clinical trials were abstracted of which 224 met the inclusion criteria. In the logistic regression model, no significant difference was noticed between the European and American journals in randomization, blinding, sample size, CAM intervention and duration of follow up. Adjusting for these variables in the multivariate model, the odds ratio of US vs. European journals to publish a positive CAM trial was 0.284 (95% confidence interval 0.153 to 0.527). Amongst the highest impact factor general medicine journals, European journals are significantly more likely to publish positive CAM trials compared to American journals. This probably represents a true publication bias, and could be related to the type of studies received by a journal or a bias in editorial decision making.

THE EFFECT OF CHRONIC EXERCISE ON VASCULAR AND KIDNEY RESPONSES IN THE SPONTANEOUSLY HYPERTENSIVE RAT

Cassandra M. Borg (Biological Sciences)

Chris Schmitz (Biological Sciences)

Penny Knoblich, Faculty Mentor (Biological Sciences)

Hypertension is among the leading causes of cardiovascular disease, with 65 million Americans suffering from the vascular disorder. Hypertension is believed to result, in part, by the kidney's failure to remove excess sodium and water from the body, as blood pressure rises. Regular exercise has been proven to reduce blood pressure in both humans and rats by reducing the development of atherosclerotic plaques, body weight, and resting heart rate, and alter hormone levels. The effect of exercise on kidney sodium excretion in response to a rise in blood pressure, has not previously been examined. Methods: Thirty male spontaneously hypertensive rats (SHR) will be randomly placed into one of the following groups: Exercise (given an exercise wheel from weaning to 12-14 weeks of age, or Sedentary (no exercise). Exercise time and running distance will be recorded daily. At 14-weeks of age, rats will be anesthetized (Inactin, 100mg/kg). A breathing tube will be placed in the trachea, and cannulas will be inserted into the carotid artery (to monitor blood pressure and heart rate), the jugular vein (to infuse saline to maintain fluid balance), and into the bladder for urine collection. After a baseline 15-minute period which includes a urine collection, blood pressure will be artificially raised by tying off the celiac, mesenteric, and lower abdominal aorta. Blood pressure will be monitored and urine collected during 3 additional 15-minute periods. Urine will be analyzed for sodium excretion, and data will be compared between sedentary and exercise rats.

RENEWABLE ENERGY FROM THE OCEANS, THE OCEAN THERMAL ENERGY CONVERSION SYSTEM (OTEC)

Elizabeth Drommerhausen (Speech Communication)

Brian Klosa, Faculty Mentor (Speech Communication)

Joseph Huang of the National Oceanic Atmospheric Administration explained that oceans are the biggest collector of solar energy on Earth. Dr. John Craven has discovered how to tap this energy by creating a way of using the temperature difference in the oceans as a form of renewable energy. This ingenious process is known as Ocean Thermal Energy Conversion or OTEC for short. According to the U.S. Department of Energy the energy conversion efficiencies are an astounding 97 percent. The Applied Thermal Engineering Journal of October 2005 states that OTEC system is considered to be extremely essential to the production of a renewable energy source. By understanding the process, the applications, and the implications of this technology, the Ocean Thermal Energy Conversion system will be a realistic and renewable source of energy for future generations.

INITIAL COMPARISON OF DNA SEQUENCE VARIATION BETWEEN A 5-SNP CLUSTER ON THE Y-CHROMOSOME AND AN SNP-RICH REGION OF THE MITOCHONDRIAL DNA

Michael Bradley Burns (Chemistry and Geology)

Cassidy Punt (Chemistry and Geology)

James Rife, Faculty Mentor (Chemistry and Geology)

Theresa Salerno, Faculty Mentor (Chemistry and Geology)

Mitochondrial DNA (mtDNA) and Y-chromosomal DNA, inherited from the mother and father respectively, are extensively used for lineage studies (Underhill, P. A. et al., Nature Genetics, 26, pp. 358-361, Nov. 2000). Comparisons of the geographical regions of origin and the presence of certain SNPs (single nucleotide polymorphisms) on both the Y-chromosomal DNA and the mtDNA have provided useful information in the fields of forensic work and anthropology. However, the Y Chromosome only reflects a single lineage for an individual rather than the individual's very complex heredity. Use of mtDNA is similarly limited. The goal of this project is to investigate correlations in diversity between these two sources of DNA to see if they reflect similar geographical heredity. In this research project, DNA samples were collected from males with diverse geographical backgrounds, amplified by the Polymerase Chain Reaction (PCR) and sequenced to determine if any SNP variations were present. The primers were designed to allow PCR amplification of a cluster supposedly containing five SNPs between positions 20,758,511 and 20,758,579 on the Y-chromosome. The same samples were also amplified using primers that amplify an SNP-rich region of mtDNA between positions 4,200 and 4,600. Observed SNPs were matched with published frequencies in various populations. Correlations were made between the likely geographic origin indicated by the Y-SNPs and the mt-SNPs and the actual ethnic origin of the donor.

DETERMINATION OF GENETIC DIVERSITY OF RIVER OTTER POPULATIONS IN MINNESOTA

Sunnie McCalla (Biological Sciences)

John D. Krenz, Faculty Mentor (Biological Sciences)

Natural populations differ genetically from one another primarily because of natural selection and limitations on the exchange of individuals (restricted gene flow). Because a population's ability to adapt to a changing environment depends of genetic variability, a restriction in the exchange of individuals may subsequently result in reduced fitness. Knowledge regarding the genetic make-up of populations is important in the conservation of biological diversity to allow the identification of potential source populations and to maintain variability in small populations. Once widespread, river otter populations in Minnesota were greatly reduced or eliminated due to human activity. Current populations have rebounded and translocations of animals from source populations to areas of local extinction such as the Minnesota River have occurred or are being contemplated. My goal was to quantify (DNA) genetic differences among populations of river otters intimately associated with drainage systems in Minnesota to formulate a phylogenetic map. I hypothesized that populations which are more connected by river systems would probably exchange individuals more frequently and would thus be more similar genetically. Otter tissue was collected from trappers. I used DNA sequence data from prior studies in other states to develop a method for genotyping Minnesota otters. I compared DNA of otters from the Upper Mississippi River and Lower Mississippi River populations, and also compared them to the St. Louis River population (which is not connected to the Mississippi River). The development of our methods for obtaining genotypes and our preliminary data will be presented.

EFFECT OF CONDITIONED MEDIUM ON THE RECOVERY OF DORMANT MYCOBACTERIA IN CULTURE

Kelly E. Rock (Biological Sciences)

Timothy E. Secott, Faculty Mentor (Biological Sciences)

Mycobacterium avium subsp. *paratuberculosis* (Mpt) is the etiologic agent of Johne's disease, a chronic intestinal disease in cattle that threatens the economic viability of dairy farming. Diagnostic culture is typically unrewarding until several years after infection when clinical signs can be observed. This leads to widespread infection within the herd. Difficulty in culturing Mpt may be a result of oxidative damage due to the increased metabolic rate when dormant organisms are recovered in a nutrient rich medium. In order to improve recovery it is believed that some organisms secrete a growth factor in times of environmental stress which enables them to grow more quickly when conditions improve. The purpose of the project was to test conditioned medium and its components as a method of improving the recovery of Mpt. The conditioned medium from Mpt was separated into 4 fractions based on molecular weight using centrifuge filters. Unsupplemented media (Middlebrook 7H9C or Luria-Bertani broth) and those containing serial dilutions of fractionated or unfractionated Mpt-conditioned medium were inoculated with Mpt or *Mycobacterium smegatis* (MS); a non-pathogenic species. Growth was monitored by measuring the optical density of the cultures for up to 21 days. Unfractionated Mpt-conditioned medium promoted a two fold or greater enhancement of Mpt growth, but had no effect on that of MS. Results of treatment with conditioned medium fractions are pending. Recovery of dormant Mpt was increased by the use of conditioned medium.

Session E - Engineering

Moderator: Dr. Patrick Tebbe

Greg Anderson and Jake Jerdee (B. Jones) *Analysis Of A Semi-Direct Injection Two-Stroke Snowmobile*

Eric Newman, John Kellander, and Kayle Pauling (G. Mead) *2006 Formula SAE (Society of Automotive Engineers) Racecar Competition*

Ryan Henkensiefken and Michael Krause (W. James Wilde) *The Effects of Internal Curing on the Properties of Concrete*

Sumit Shrestha (R.A. Nair) *The Conical Helical Antenna*

Wade Luhman (P. Tebbe) *Effects Of Thermal Boundary Conditions During Finite Element Modeling of Physical Vapor Transport*

ANALYSIS OF A SEMI-DIRECT INJECTION TWO-STROKE SNOWMOBILE

Greg Anderson (Automotive Engineering Technology)

Jake Jerdee (Automotive Engineering Technology)

Bruce Jones, Faculty Mentor (Automotive Engineering Technology)

This project concerns Minnesota State Mankato's Automotive Engineering Technology's entry into the 2006 SAE Clean Snowmobile Challenge. The focus of the SAE Clean Snowmobile Challenge is to modify a stock snowmobile to make it more fuel efficient, quieter, and with less emissions while still retaining its performance. This presentation will include background data as well as decisions involving: model and engine choice, modifications made, and methods for modification. Also included will be the results of these modifications on performance, emissions, noise reduction, production cost, durability, fuel efficiency, safety, and rider comfort. Results based on these goals and data from the competition will be analyzed for their advantages and disadvantages.

2006 FORMULA SAE (SOCIETY OF AUTOMOTIVE ENGINEERS) RACECAR COMPETITION

Kayle Pauling (Automotive Engineering Technology)

Eric Newman (Automotive Engineering Technology)

John Kellander (Automotive Engineering Technology)

Gary Mead, Faculty Mentor (Automotive Engineering Technology)

The Society of Automotive Engineers hosts a competition every year to challenge teams of undergraduate and graduate level to conceive, design, fabricate and compete with a small formula style autocross racing car. This presentation describes the analysis, process, design and construction of the vehicle Minnesota State Mankato registered for the 2006 Formula SAE Competition. It includes details on the fuel utilized (E-85), fabrication process, cost, and manufacturability. Our goal was to build a car with high performance qualities in acceleration, braking, and handling, in order to demonstrate and prove our creation and engineering skills in comparison to other universities around the world.

THE EFFECTS OF INTERNAL CURING ON THE PROPERTIES OF CONCRETE

Ryan Henkensiefken (Civil Engineering)

Michael Krause (Civil Engineering)

W. James Wilde, Faculty Mentor (Civil Engineering)

There are many factors affecting the properties of concrete. This project focused on the effects of using different water-retaining fine aggregates on the properties of concrete, while keeping all other factors controlled. The main objective of this project is to determine what effects water retaining aggregates have on concrete, as opposed to traditional fine aggregates (sand) which have negligible water retention capabilities. Particular emphasis is placed on the shrinkage properties of concrete. All methods, materials and equipment used for testing conformed to the American Society of Testing Materials (ASTM) standards or to the American Association of State Highway and Transportation Officials (AASHTO) standards. Testing has indicated a positive result for shrinkage with significantly lower shrinkage over time when using water retaining fine aggregates to replace small proportions of traditional fine aggregates. Testing has also indicated, however, that there is a corresponding negative impact on the strength properties of the concrete when using water-retaining fine aggregates. The significance of either depends upon the intended use of the concrete. If strength but not shrinkage is a concern, water-retaining aggregates may not be warranted, however if shrinkage is a major concern such as in transportation construction, water retaining aggregates may produce a positive impact on the quality of the system.

CONICAL HELICAL ANTENNA

Sumit Shrestha (Computer Engineering)

R. A. Nair, Faculty Mentor (Electrical and Computer Engineering and Technology)

The project is intended to strengthen my research on broadband antenna conducted on summer of 2005 here at Minnesota State University, Mankato: Antenna Research Lab which investigated the behavior of cone shaped helical antenna. This broadband antenna is used mainly for transferring and receiving microwave signals with reasonably good directivity. The microwave signals are high frequency electromagnetic signals that propagate in straight line. These signals are less affected by atmosphere. The microwave signals allow the use of smaller dish and exhibit high power gain, excellent sensitivity and directional characteristics. This investigated antenna is conical in shape where the metallic rod winds around to form a helical shape structure. These antennas can be used all by themselves in short-range radar systems, such as those used by law-enforcement officers to track the vehicle speed. This type of antenna does not exist and no significant research has been done on it. This research is intended to construct such antenna and determine the possibility of manufacturing them commercially. Compared to other commercially available antennas, this antenna has smaller size and lighter mass which makes it more portable. Since the antenna is conical in shape it can be faced towards one direction and all the signals can be sent to that particular direction. This will increase the coverage range and signal reception. Also because of its conical shape, a number of such antennas can be combined horizontally to form an array to further improve its reception and coverage range.

EFFECTS OF THERMAL BOUNDARY CONDITIONS DURING FINITE ELEMENT MODELING OF PHYSICAL VAPOR TRANSPORT

Wade Luhman (Mechanical Engineering)

Patrick Tebbe, Faculty Mentor (Mechanical Engineering)

Physical vapor transport (PVT) is a material processing method commonly used to produce different types of semiconductor materials. Computer modeling of PVT is important to understand the fundamentals of the processing method. Due to the large amount of computer processing power and storage needed to solve the computer models many of the previously solved simulations have been simplified to efficiently utilize computer usage. Previous PVT computer simulations of mercurous chloride (Hg_2Cl_2) have assumed constant temperature profiles on the source and crystal substrate for simplicity. These simulations were performed using the FIDAP computational fluid dynamics software package. In this research the system boundary conditions for the previously solved mercurous chloride models were modified using the FIDAP software package to more accurately represent an actual PVT system. The results were then compared to the previously solved simplified cases and the boundary condition affects were examined. These results are important for the crystal growth and semiconductor community in improving future processes and product quality.

Session F - Speech Communication

Moderator: Dr. Brian Klosa

Joshua Randall (B. Klosa) *Miracle on Ice: One Game That Impacted a Nation*

Kirsten Markiewicz and Maria Jensen (B. Lund) *Qualitative Case Study Of A Person Living With Asperger's Syndrome And Parental Experience*

Joshua Randall and Lindsey Thompson (J. Dimock) *An Investigation Of Student Perspectives On Classroom Resource Usefulness*

Emily Kofoed (L. White) *From Mao To Hoover: A Rhetorical Analysis Of The 2005 Minneapolis Public Library Ad Campaign*

Joshua Randall (B. Klosa) *Graduate Assistant Mistreatment: Students Or Employees?*

THE MIRACLE ON ICE: ONE GAME THAT IMPACTED A NATION

Joshua Randall (Speech Communication)

Brian Klosa, Faculty Mentor (Speech Communication)

No one can deny the popularity of sports in our society. These games or competitions often transcend the mere playing arena and become integrated into the mindset of popular culture. Often unique political, social and/or cultural events not only correspond but also become interwoven with the sports community. One such interwoven moment is the "Miracle of Ice" hockey game played between the United States and the Soviet Union during the 1980 Winter Olympics. Utilizing various literary and popular texts with archival video footage, this multi-faceted oral presentation will showcase the historical background, results and implications of this single hockey game. By combining past and current reflections of this "miraculous" event, the performance should clearly demonstrate and prove the powerful emotional impact of sports and culture.

QUALITATIVE CASE STUDY OF A PERSON LIVING WITH ASPERGER'S SYNDROME AND PARENTAL EXPERIENCE

Kirsten Markiewicz (Communication Disorders)

Maria Jensen (Communication Disorders)

Bonnie Lund, Faculty Mentor (Communication Disorders)

The purpose of this research project was to understand the language development of a person with Asperger's Syndrome (AS). It was our goal to develop the skills of qualitative research while gaining an understanding of the specific language skills of an individual identified with a syndrome and be able to compare findings to existing literature. AS is a neurological disorder that was recognized by Hans Asperger, an Austrian pediatrician, in 1944. The most common characteristics of the disorder consist of impaired social skills, preference of sameness, poor nonverbal communication skills, special interests, lack of interaction and delays in speech and language development. AS is an autism spectrum disorder. We chose a 23 year old individual with AS, who was seen at the Speech Pathology Clinic at Minnesota State University, Mankato (MSU). An archival review of the file was completed and interviews conducted with one parent for additional information. Data from the file review and parent interviews were collected and analyzed utilizing qualitative inquiry. We attempted to explore how the parent makes sense of the experience of having a child with AS and document the parent's "story" with regard to living with a child with AS.

AN INVESTIGATION OF STUDENT PERSPECTIVES ON CLASSROOM RESOURCE USEFULNESS

Joshua Randall (Speech Communication)

Lindsey Thompson (Speech Communication)

James Dimock, Faculty Mentor (Speech Communication)

The aim of this project is to analyze students' opinions of class material quality and usefulness and whether or not students use class materials. With data collected from the surveys, trends among students and faculty (as perceived by students) will be identified and suggestions will be provided to improve effectiveness and/or use of classroom materials if data indicates that such is necessary.

FROM MAO TO HOOVER: A RHETORICAL ANALYSIS OF THE 2005 MINNEAPOLIS PUBLIC LIBRARY AD CAMPAIGN

Emily Kofoed (Speech Communication)

Leah White, Faculty Mentor (Speech Communication)

The Minneapolis Public Library has been preparing for a move into a newly constructed building in 2006. To raise \$15 million for the new building, a Minneapolis design firm volunteered to create an edgy campaign that would run in space donated by local media. The ad campaign juxtaposed vilified historical figures who worked as librarians in the past with images of the new library. Reactions to the campaign were widely varied. Some found the ads exciting and ironic, while others were greatly offended by them. By examining Cheree Carlson's article "Creative Casuistry and Feminist Consciousness: The Rhetoric of Moral Reform," and applying it to the Minneapolis Public Library ad campaign, we can gain a better understanding of the implications of this unique fundraising strategy.

GRADUATE ASSISTANT MISTREATMENT: STUDENTS OR EMPLOYEES?

Joshua Randall (Speech Communication)

Brian Klosa, Faculty Mentor (Speech Communication)

In 2005 there were over two hundred and sixty thousand Graduate Assistants, or GAs in the United States. Graduate Assistants accepted positions as GAs hoping to gain valuable experience in the educational setting, but find out that when they leave universities they leave with massive debt and without the skills needed to succeed outside of academia. In a study of Graduate [Assistant] Treatment referenced in the July, 2005 edition of *Physics Today*, abuse and exploitation were commonly used to describe GA treatment. The article concluded, "when abuse has become habitual and acceptable, then it is no longer perceived as unethical. Instead, it is perceived as business as usual." GAs have been systematically abused in the academic setting, without a vehicle to change their situation. In an attempt to give graduate assistants the rights they deserve, the problems with the current system must first be identified, then the causes must be understood, before finally discussion solutions to ensure these workers can attempt to receive fair treatment.

Session G - English

Moderator: Dr. Gretchen Haas

Mike Goracke (G. Haas) *Killing For Fun: A Study Of The Effect Violent Videogames Have On The Player*

Natalie Casper and Mary O'Connor (S. Johnston) *Jane Austen: Female Originality In Literature*

Lisa Sikkink (S. Johnston) *Utopian Literature from the Sixteenth Century to Present Day*

Kelly Biers (T. Corbett and R. Robbins) *Where We Live*

Mandi Bingham (T. Corbett and R. Robbins) *Where We Live*

Marissa Hansen (T. Corbett and R. Robbins) *Where We Live*

Nathan Klein (T. Corbett and R. Robbins) *Where We Live*

KILLING FOR FUN: A STUDY OF THE EFFECT VIOLENT VIDEOGAMES HAVE ON THE PLAYER

Mike Goracke (Technical Communication)

Gretchen Haas, Faculty Mentor (Technical Communication)

Many studies have been done to see if there are aggressive effects on people that play violent videogames. Even in the early 80s, there was concern that games like *Pac Man* were too violent for the youth. Most of these studies have concluded that violent games have a negative effect. Yet, I believe that many of these studies have had flaws in the methodological planning. I based my study off a previous study done by Bushman and Anderson. My study had 10 male MSU students listen to a scenario that would gauge aggressive responses, then had to write how they would react in that specific situation. I then had the participants play a violent videogame for 20 minutes. They then completed a different scenario by writing how they would react to that specific situation. I compared the number of aggressive responses recorded in the two scenarios before and after playing the videogame. I could then see if there was a correlation between violent videogame playing and aggressive behavior/responses. Results from this study concluded that there is, in fact, an increase in aggressive behavior/responses after playing violent videogames.

JANE AUSTEN: FEMALE ORIGINALITY IN LITERATURE

Natalie Joy (King) Casper (English)

Mary O'Connor (English, Political Science)

Mary Susan Johnston, Faculty Mentor (English)

Jane Austen has created characters that support female originality. This project examines Austen's novels, *Pride and Prejudice*, *Sense and Sensibility* and *Emma* in order to demonstrate how the characters in these novels support this originality. This project will refer to the characters discussed in these novels thoroughly and analyze how they demonstrate individuality in Austen's novels as she presents them in romantic relationships, social classes and gatherings and as she illustrates their communication with their peers and family in her literature.

UTOPIAN LITERATURE

Lisa Sikkink (English, Literature)

Mary Susan Johnston, Faculty Mentor (English)

Sir Thomas More's *Utopia*, Lois Lowry's *The Giver*, Ray Bradbury's *Fahrenheit 451*, Aldous Huxley's *Brave New World*, Charlotte Perkins Gilman's *Herland*, Yevgeny Zamyatin's *We*, and George Orwell's *1984*, are all works of utopian literature. Although they were written at different time periods, the issues they explore are remarkably similar. My research project explores such ideas as literature, sex and reproduction, society, and family life in these utopian works in order to demonstrate these affinities.

WHERE WE LIVE

Kelly Biers (English)

Tyler Corbett, Graduate Student Mentor (English)

Richard Robbins, Faculty Mentor (English)

As a part of a group project exploring the theme *Where We Live* through various styles of creative writing, I chose to express the theme through fiction. For my piece, the theme was incorporated into a series of storylines centered around the issue of homelessness. *Where We Live* carried three basic interpretations that were examined in my piece: a physical location and landscape, a current state of the world in which we live, and a state of mind in society and individuals. Each storyline was affected in a different way by these three interpretations. Also, the group decided to place in each of our works a series of objects that unified our individual pieces. We attained our goals through observation, discussion, research, and workshop. I will read my piece to the audience, as we will each individually present our writing at the conference.

WHERE WE LIVE

Mandi Bingham (English)

Tyler Corbett, Graduate Student Mentor (English)

Richard Robbins, Faculty Member (English)

For our project, group members explored the theme *Where We Live* in its varied interpretations through fiction, nonfiction, and poetry. For my portion of the project, I explored the theme *Where We Live* through fiction. I focused on both the physical surroundings of where we live and the state of mind one lives in, also incorporating the objects that each member placed in their works. Hoping that others gain from my perspective, I plan to share my piece with the audience.

WHERE WE LIVE

Marissa Hansen (English)

Tyler Corbett, Graduate Student Mentor (English)

Richard Robbins, Faculty Member (English)

For our project, group members explored the theme *Where We Live* in its varied interpretations through fiction, nonfiction, and poetry. For my project, the theme *Where We Live* was addressed through creative nonfiction. I wanted to explore my own value as a writer, to myself and to my peers. The piece I wrote was influenced by my vision of personal events in my own life as well as the objective view of my narrator and her interpretation of the landscape I placed her in. As a creative writing theme, *Where We Live* suggests landscape, or physical, geographical location. As well, in a figurative sense the theme implies a current state of the world, or cultural view of specific/general world events. Also, *Where We Live* carries a state of mind quality, such as community or individual consciousness. As creative writers, by focusing on our theme and approaching the project from these different angles, we were able to examine our own lives and stories to achieve an objective view of the “landscape” in which we live. My goal was to produce a story that would challenge the narrator’s individual consciousness as well as my ability as a writer to create said challenges. As an additional challenge, our group has placed within each piece a series of reoccurring objects that unify our individual pieces. We attained our goals through observation, discussion, research, and workshop. Hoping that others gain from our awareness, we plan to present our writing at the conference, individually reading our work to the audience.

WHERE WE LIVE

Nathan Klein (English)

Tyler Corbett, Graduate Student Mentor (English)

Richard Robbins, Faculty Mentor (English)

For my part of the project I tied in the theme of *Where We Live* through a series of poems. The aspects of the theme that I based my poems on included interpretations on where we live mentally, spiritually, chronologically, geographically in the universe, and on earth. I used the theme to pinpoint just where it is that we all truly live; even in those areas where a pin has no place.

Session H - Business

Moderator: Dr. Penny Herickhoff

Julie Dahanaike (P. Herickhoff) *Religious And National Origin Diversity In The Workplace*

Timothy Peterson (V. Luoma) *National Security Agency Wiretapping of U.S. Citizens During the Bush Presidency*

Shayamini Weeramantri (G. Holmes) *Cycle Of Poverty And Unequal Educational Opportunities*

Min Budhathoki (K. Woo Park) *An Empirical Analysis of Temporal Relation Between Mortgage Interest Rate and Residential Gasoline Price*

Jessica Albright and Melissa Radabaugh (B. Flannery) *Service Learning And Perceived Student Value*

Yahye Ali (G. Holmes) *Riba (usury) and Islamic Modes of Finance*

RELIGIOUS AND NATIONAL ORIGIN DIVERSITY IN THE WORKPLACE

Julie Dahanaike (Management and Business Law)

Penny Herickhoff (Business Law)

In the last decade, southern Minnesota has grown to be more ethnically and racially diverse. The purpose of this research project was to interview four major southern Minnesota employers, including Mayo Clinic and Taylor Corp, about their compliance strategies in meeting the requirements of Title VII, which prohibits discrimination in employment practices on basis of religion or national origin. A primary focus was to learn more about whether the businesses interviewed includes diversity training in their compliance strategy, what form training takes and the frequency of such training. In conclusion, I will be comparing and contrasting their compliance with diversity legislation and their approaches to employee training and other educational techniques.

NATIONAL SECURITY AGENCY WIRETAPPING OF U.S. CITIZENS DURING THE BUSH PRESIDENCY

Tim Peterson (Accounting and Business Law)

Vicki Luoma, Faculty Mentor (Accounting and Business Law)

George Bush's authorization to allow the National Security Agency to eavesdrop on some American citizens without a court order has raised numerous legal and ethical issues. Questions include whether Bush's actions were necessary and/or legal, whether and to what extent there should be Congressional and judicial oversight, whether it was legal for an NSA employee to talk to the media about classified information, and whether it was proper for the media to expose the President's policy. In addition to conducting legal research, I hope to gain insight on the propriety of Bush's actions by exploring people's attitudes towards national security, privacy, and government openness in a post 9/11 world.

CYCLE OF POVERTY AND UNEQUAL EDUCATIONAL OPPORTUNITIES

Shayamini Weeramantri (Accounting)

Georgia Holmes, Faculty Mentor (Business Law)

Education is critical to break the cycle of poverty. Education has a direct relationship with income level and people with low levels of education are much more likely to be unemployed and to remain unemployed for longer periods of time. A good education develops not only job-related skills, but also personal strengths, self esteem and life skills. Ironically, lack of income can prevent a child's opportunity to participate in educational activities, which in turn increases the likelihood of unemployment. When children are challenged with poor physical or mental health, unsuitable housing, conflicting family relationships and accessibility problems (which are directly or indirectly affected by income level), they are less likely to retain and participate in education. The recent trends in the job market indicate that higher levels of education have become crucial for stable employment more than ever, especially due to globalization.

AN EMPIRICAL ANALYSIS OF TEMPORAL RELATION BETWEEN MORTGAGE INTEREST RATE AND RESIDENTIAL GASOLINE PRICE

Min Budhathoki (Economics)

Kwang Woo Park (Ken), Faculty Mentor (Economics)

The general economic theory confirms that there is a positive relationship between interest rate and price through the demand for money. This paper tests the statistical significance of using residential gasoline price as a leading indicator for predicting Mortgage Interest Rate in the US. In particular, time-varying betas are estimated by using Kalman filter technique that is the special case of the general state-space model in order to investigate the significance of the temporal relations between the mortgage interest rate and the gasoline price. Empirical results show that the gasoline price is leading the mortgage interest rate significantly and can be used to predict the short-run direction of mortgage interest rate.

SERVICE LEARNING AND PERCEIVED STUDENT VALUE

Jessica Albright (Management)

Melissa Radabaugh (Management)

Brenda Flannery, Faculty Mentor (Management)

Many students graduate from college with no idea about what to do with the knowledge they just spent four years acquiring. However, for years service learning has provided a way for students to apply the knowledge they learn in the classroom to a "real-world" setting. Students who have participated in service learning activities have an opportunity to enhance both their professional development and civic engagement. Based on our research and experience, problem-solving, teamwork, and self-confidence were key developmental areas perceived to be of value to students who participated in a service learning project.

RIBA (USURY) AND ISLAMIC MODES OF FINANCE

Yahye Ali (Accounting & Business Law)

Georgia Holmes, Faculty Mentor (Business Law)

This research will talk about what the definition of interest is, how Shari'a law deals in it and bad effects it can have both economy and society. In this presentation, I will also talk about alternatives that Shari'a law has the economy without usury or interest to take. I will also mention in this research the pros and cons interest has on individuals.

Session I - History, Anthropology, Sociology, and Philosophy

Moderator: Dr. Dennis Waskul

Adam Gish (C. Corley) *Climate Change, Famine And Witches: A New Interpretation Of The European Witch Hunts*

Bridget Heussler (C. Corley) *The Effect Of Single Women And The Early Modern Economy*

Jessica Friton (D. Waskul) *Gendered Inequalities In Sex Education Curriculum*

Bailey Rolfsrud (C. Matarrese) *Supreme Court's Error In 2002 Decision Makes For Unconstitutional Monetary Giveaway*

Rebecca Unetic (L. Witherell) *Anti-Machine Breaking Propaganda In Early Nineteenth-Century England*

Melanie Garcia (L. Witherell) *The Founding Of The Front De Librations Du Quebec And The Evenets That Led To The Crisis Of 1970*

Stan Wheatman (L. Witherell) *The FLQ Manifesto*

CLIMATE CHANGE, FAMINE AND WITCHES: A NEW INTERPRETATION OF THE EUROPEAN WITCH HUNTS

Adam Gish (History)

Christopher Corley, Faculty Mentor (History)

Many scholars in our society are concerned with the environmental and economic effects of global climate change, but they spend little time considering its long-term social and cultural impact. On the other hand, History has something to teach us about the effects of weather patterns on past peoples. For example, historians have shown that climate change had a devastating impact on Europe's population in the sixteenth and seventeenth centuries. They have also made suggestive links between climate change and the rise of the witch hunts. In these perspectives, agricultural crises precipitated by poor weather created hostile village relationships that resulted in accusations of witchcraft. There are two problems with this view: First, European peasant farmers had experienced misfortune for centuries without resorting to violence framed by accusations of witchcraft. Second, widespread witch hunts existed as early as the fourteenth and fifteenth centuries.

My research shows that there is indeed a link between climate change and witch hunts, but that the concern emerged from the elites' fears of weather magic, not from villagers. Throughout the early and high Middle Ages, elite theologians expressed little concern about weather magic. It was not until Europe experienced climate catastrophes in the fourteenth century, followed by widespread famine and plague, that weather became an issue for the elites. My interpretation shows that the elites were to blame for the witch hunts as climate change threatened their material well-being. Only later were these fears passed to villagers through woodcut illustrations and sermons.

THE IMPACT OF SINGLE WOMEN AND THE EARLY MODERN ECONOMY

Bridget Heussler (History)

Christopher Corley, Faculty Mentor (History)

Historians have shown that women are generally more accepted as workers within thriving economic environments. This is particularly true of eighteenth-century Europe, a time of economic transition, expansion and social flux. Historians have indicated a rise of never-married women in eighteenth-century towns and cities, but our knowledge of women's specific roles and contributions during this time of economic expansion remains slim.

My research examined and compared tax records from the parish of St. Philibert in Dijon, France between 1730 and 1750. An examination of the tax records allows historians one indication of the overall economic contribution of individual householders within specific neighborhoods. By comparing the sheer numbers of single and widowed women, and their professions, tax assessments, and living arrangements, historians can suggest a pattern of women's economic involvement over time. This research serves not only as a way to verify and delineate the suggestions of other historians about the potential roles of women in the eighteenth-century urban economies, but also provides an opportunity to discover what life was like for the single, never-married, and widowed women of early modern Dijon.

GENDERED INEQUALITIES IN SEX EDUCATION CURRICLUM

Jessica Friton (Sociology)

Dennis Waskul, Faculty Mentor (Sociology)

This study explored how high-school sex education reinforces gender stereotypes and inequalities. Existing literatures document how female sexual pleasure is ambiguously defined and for the most part socially and culturally absent. In both subtle and overt ways, sex education enforces these themes of ambiguity and absence. This research documents how these stereotypes and inequalities appear in the content of high-school sex education curriculum used as well as the language used. This study included semi-structured in-depth interviews of health instructors that assess how instructors negotiate these issues and content analysis of their sex education curriculum. Results include instructor requirements, curriculum restrictions, value and belief issues, and genital definitions. This study reveals an overall lack of sex and sexuality in sex education.

SUPREME COURT'S ERROR IN 2002 DECISION MAKES FOR UNCONSTITUTIONAL MONETARY GIVEAWAY

Bailey Breck Rolfsrud (Philosophy)

Craig Matarrese, Faculty Mentor (Philosophy)

My thesis is that the Supreme Court made in an error in judgment in *Zelman v. Simmons-Harris*. I propose to support my thesis with two separate steps. First, I will make an analysis of all of the concurring and dissenting opinions. Second, I will create three sound arguments amongst this by examining all of the arguments individually. Furthermore, I will conclude that the Supreme Court's decision on the Program at hand fails the test of Constitutionality. It fails this test because it directly funded thousands of children every year to learn religious indoctrination. It has not been helping a disabled child learn, or allowed a child to get to school on a bus. It has been directly giving more than enough money for that child to choose a school of religion, since, with the Program at hand, that will be the only thing the child can afford. It is unconstitutional to allow one religion preference over another, and that is what has happened with *Zelman v. Simmons-Harris*. Thus, I will be arguing that the decision over the governmental supply of monetary funds to religious schools in Cleveland, Ohio, which was decided in *Zelman v. Simmons-Harris*, was unconstitutional.

ANTI-MACHINE BREAKING PROPAGANDA IN EARLY NINETEENTH-CENTURY ENGLAND

Rebecca Unetic (History)

Larry L. Witherell, Faculty Mentor (History)

After the introduction of machinery in agricultural and the textile trades in the late eighteenth century, workers often reacted by attacking and destroying the new machinery. This machine breaking ended in the 1830s with a surge of religious, political and working class propaganda. This paper will identify and explain those factors that brought about an end to the working class machine breaking in the early 1830s. This paper will use political and religious pamphlets, working class and radical publications, *The Times* [of London], parliamentary debates, memoirs and autobiographies, biographies and other secondary literature.

THE FOUNDING OF THE FRONT DE LIBERATION DU QUEBEC AND THE EVENTS THAT LED TO THE OCTOBER CRISIS OF 1970

Melanie M. Garcia (History)

Larry L. Witherell, Faculty Mentor (History)

The FLQ, a Marxist group founded in 1963, sought to overthrow the Quebec provincial government and establish an independent Quebec. From 1963 to 1970 the FLQ committed over 200 acts of political violence, including bank hold-ups and bombings that caused at least three deaths. The FLQ is best known for the October crisis of 1970 which involved the kidnapping of a British diplomat and Canadian politician, who was later murdered. This paper examined the Canadian government's response to the FLQ political violence between 1963 and 1970, and demonstrated how the failure of the government to take the FLQ seriously led to the October 1970 events of political kidnapping and murder. Resources used in this study included Canadian parliamentary debates, newspapers from Montreal, Ottawa, Toronto, and Québec, memoirs and autobiographies of political leaders and participants, contemporary reports, and biographic and other secondary scholarship.

THE FLQ MANIFESTO

Stan Wheatman (History)

Larry L. Witherell, Faculty Mentor (History)

In 1963 the Quebec Liberation Front (FLQ) was formed as a violent revolutionary movement made up of volunteers to fight for the liberation of Quebec. In 1970 the FLQ kidnapped British diplomat James Cross and Quebec politician Pierre Laporte in order to gain the release of all FLQ political prisoners in Quebec, and to push for Quebec's independence. The FLQ did not obtain the release of any political prisoners, but their manifesto of grievances against the Canadian government was read on national television. This paper established that the manifesto advanced popular support for sovereignty for Quebec among French Canadians, and eventually lead to the referendum for independence in 1980. This paper used Toronto, Ottawa, Montreal, Quebec and New York newspapers, political memoirs and autobiographies, parliamentary debates, biographies, and other secondary sources.

Poster Session A

1. **Phil Hintz (F. Yuan)** *Environmental Changes And Their Impacts On China*
 - *2. **Mohamed Alimici (J. Vieceli)** *What Causes Poverty In Africa?*
 3. **Corey Thibeault (J.W. Page)** *Embedded Real Time Operating System For Pain Research*
 4. **Angela Isackson, Jonathan Lipinski, Tom Morton, and Chad Otto (F. Wilkerson)** *The LeSueur River Capture*
 5. **Lecia Sims (K. Blue)** *An Investigation Into Human Decomposition In A Cold Climate Region: A Winter Ecosystem Effects On Postmortem Interval Estimates*
 6. **Christine Halling (R. Schirmer)** *A Faunal Analysis Of The Silvernate Site, Goohue, MN; Features 1 And 2*
 7. **Joel Juen (R. Schirmer)** *Analysis Of Pit Features From The Silvernate Site*
 8. **Caitlin Buchkoski (B. Poburka)** *A Normative Study For Voice Turbulence Index (VTI)*
 9. **Kelly Ritter, Evan Panitzke, and Emily Kruse (P. Hargrove)** *The Use Of Paralinguistics In Spontaneous Speech Of Children With Williams Syndrome And Typically Developing Children*
 10. **Christopher Wagner (P. Tebbe)** *Simple Formulations Of Thermodynamic Properties*
- *Moved to Session H

ECONOMIC CHANGES AND THEIR ENVIRONMENTAL IMPACTS OF CHINA

Phillip Hintz (Geography)

Fei Yuan, Faculty Mentor (Geography)

A recent surge in economy has put China at the forefront of the world in terms of industry and gross domestic product. With the rise in manufacturing, the economy has changed to a more urbanized country focused on manufacturing. A booming economy has caused an already vulnerable environment to fall further into submission. Water shortages, forest loss, soil degradation, and pollution are the most threatening environmental problems affecting not only China itself but the rest of the world. This study aims to explore various effects of China's industrialization towards nature and the people affected by it.

***WHAT CAUSE POVERTY IN AFRICA?**

Mohamed A. Alimici (Management)

Jackie Vieceli, Faculty Mentor (Political Science)

Although it has been almost 46 years since most countries in Africa attained independence, there are no remarkable increases of growth or development that were achieved. Half of the populations live less than US\$1 a day per person and AIDS is wide spreading. The UN classified majority of the countries in the continent as least developed. Many unsuccessful attempts were made, but the continent is doomed with a cycle of poverty. Thus, the post-independence years in Africa have been referred to as "the decades of lost development." With many poor countries, African nations are among many of the poorest countries in the world, and least-developed nations in the world. African nations have been understated by dictator, corrupt government, civil war, uncountable deaths, hunger, disease, nature deserts and underdevelopment, all totaling deep poverty. There is no evidence that conclude Africa's conditions are worn than two centuries ago, but there is clear evidence of poverty that caught the attention of the world. Since the July G-8 summit and Live 8 concerts, the topic of African development and poverty has been publicly argued and received remarkable attention. While the focused of the attention was predominantly on more & better aid, debt relief and cured for AIDS & malaria, there is more insidious kind of problem faced by African that is extremely difficult to confront: An economic enslavement to the World Bank, WTO and IMF or "The Three Masters."

****Moved to Session H***

EMBEDDED REAL TIME OPERATING SYSTEM FOR PAIN RESEARCH

Corey Thibeault (Mechanical Engineering)

Jonathan Page, Faculty Mentor (Psychology)

Pain is considered the most widespread and costliest health-related problem in the United States. One of the problems facing health care professionals in relation to pain treatment is the inability to measure pain objectively. This shortcoming leaves a large gap between the self-report of pain and an accurate diagnosis of a painful condition. The brain lab is proposing a method to quantify pain response to stimulation of painful territories using the electroencephalograph (EEG). In order to implement this method, a precisely controlled stimulus is required. Also, when dealing with human subjects a responsive system is essential to ensure the comfort and safety of participants. This project was focused on filling that need with an embedded hard-real-time operating system. Several platforms were researched and a Freescale PowerPC 5200 evaluation board was chosen for its features and expandability. After reviewing several Linux options the FSM Labs RTLinux OS was chosen. The resulting system provides hard-real-time functionality on a platform that lends itself to expandability and portability to other hardware options.

THE LE SUEUR RIVER CAPTURE

Angela Isackson (Geography and Biology)

Jon Lipinski (Urban Studies and Geography)

Tom Morton (MS Geography)

Chad Otto (MS Geography)

Forrest Wilkerson, Faculty Mentor (Geography)

Thousands of years ago the Blue Earth River captured the Le Sueur River just south of Mankato, Minnesota. The purpose of this research was to prove that this capture occurred. Our research was based on aerial photography, topographical maps, and interviews. Results suggest that the Le Sueur River use to flow through Indian Creek, Rasmussen Woods, and present day Mankato West High School. An implication of this research is that there is a better understanding of where the old river channel flowed prior to the capture by the Blue Earth River.

AN INVESTIGATION INTO HUMAN DECOMPOSITION IN A COLD CLIMATE REGION: A WINTER ECOSYSTEM EFFECTS ON POSTMORTEM INTERVAL ESTIMATES

Lecia Sims (Anthropology)

Kathleen Blue, Faculty Mentor (Anthropology)

In the medicolegal community, establishing the postmortem interval (PMI) is critical. It not only aids in assistance with identification of human remains; it can uphold or impeach a suspect's testimony. Prior investigations into the decomposition rate for human remains have been extensive but localized. Previous research done has been chiefly limited to temperate and arid environments. Though beneficial, this work does not encompass the ecosystems that comprise the Northern United States and more specifically Minnesota. Minnesota is located in the High Plains Region of the US and is home to a large number of aquatic environments comprised of lakes and rivers. The average winter temperature is near or below freezing for multiple months. Explorations for PMI in terrestrial and aquatic settings within regions that display a cold climate have been insufficient. Conclusions from aforementioned research have routinely been limited to the statement: "decay is retarded in cold temperatures due to decrease in insect activity." This project first examined the limitations previously investigated in estimating the postmortem interval (PMI) with regards to terrestrial and aquatic settings in a cold climate. Second, I explored the ecological environment of southern Minnesota, specifically temperature, insect, carnivore and rodent activity, all of which would affect decay rates during the winter season. Finally, possible effects from multiple freeze-thaw cycles with respect to human decomposition were investigated. The purpose of this research was to add to the PMI database and aid in establishing a more complete system for estimating time of death.

A FAUNAL ANALYSIS OF THE SILVERNALE SITE, GOODHUE, MN; FEATURES 1 AND 2

Christine Halling (Anthropology)

Ronald Schirmer, Faculty Mentor (Anthropology)

Throughout time people have utilized both animal and plant resources and the methods that they used are unique to their time, place and season. By understanding the ways in which specific groups of people utilized the animal remains it provides additional techniques to aid in interpretation of a co-habited archaeological site. These techniques while not new have not been utilized in the analysis of many sites. The analysis of faunal remains from the Silvernale site plays a vital role in the interpretation of the archaeological site because in this case, by identifying what faunal material a group of people were utilizing it narrows down the seasons in which they were living on the land and the time and continuity across the archaeological site. The material was collected from the archaeological site Silvernale which is located in Goodhue, MN. The faunal material recovered from the site mainly consisted of mammal, avian, reptilian and fish bone. Remains were recovered through a collection of soil samples, cleaned using a floatation machine, and then broken down into four main categories: charcoal, lithic debitage (the flakes of rock cast off from shaping stone), pottery and fauna. Visual analysis identified the bone fragments and the data tabulated to aid in providing further context for the site. These techniques of indicating seasonality by interpreting the animal remains is a valuable contribution to understanding subsistence and the archaeological site as a whole.

ANALYSIS OF PIT FEATURES FROM THE SILVERNALE SITE

Joel Juen (Anthropology)

Ronald Schirmer, Faculty Mentor (Anthropology)

Precontact Native Americans discarded waste into pits near their house or village. Refuse pits become darkened areas in the soil due to concentrated organic material, which can be identified and studied. Analysis of the refuse materials shows the resource usage patterns of a cultural group. The seasons in which the site was occupied, the resources being used, and the people's interaction with other groups and their environment can all be determined by analyzing these pits. Such information is valuable in determining the social, cultural, and economic aspects of the peoples inhabiting a site, and in studying culture change.

Refuse pits excavated at the Silvernale site in Red Wing, Minnesota, inhabited between A.D. 1050-1250, offer the opportunity to shed light on this poorly-known period in the region. Some of these pits were found to be superimposed over other, older pits suggesting multiple occupations of the site. The question then becomes does multiple occupations mean occupation by different cultural groups? The best way to answer this question is to analyze the remains of the pits to determine if the resources were used in similar ways or whether they indicate the presence of different cultural groups.

A NORMATIVE STUDY FOR VOICE TURBULENCE INDEX (VTI)

Caitlin J. Buchkoski (Communication Disorders)

Bruce Poburka, Faculty Mentor (Communication Disorders)

Voice turbulence index (VTI) is an acoustic analysis parameter that provides an objective assessment of breathiness (a common feature of disordered voices). This study was conducted to establish normative data on 50 adult male and female speakers for VTI using the Kay Elemetrics Multidimensional Voice Program (MDVP). To date, normative data for VTI have not been reported in the literature.

THE USE OF PARALINGUISTICS IN SPONTANEOUS SPEECH OF CHILDREN WITH WILLIAMS SYNDROME AND TYPICALLY DEVELOPING CHILDREN

Kelly Ritter (Speech, Hearing, and Rehabilitation Services)

Evan Panitzke (Speech, Hearing, and Rehabilitation Services)

Emily Kruse (Speech, Hearing, and Rehabilitation Services)

Patricia Hargrove, Faculty Mentor (Speech, Hearing, and Rehabilitation Services)

This project investigated selected aspects of paralinguistics in spontaneous speech of speakers with Williams syndrome. Speakers with Williams syndrome “are noted for their well developed vocabulary, relatively complex and syntactically correct sentences, and their ability to spin a good tale. In contrast, their reasoning usually remains at a pre-operational or preschool level, and they typically have difficulty grasping cause-effect relations” (Semel & Rosner, 2003, p. 5).

This research focused on an area of communication called paralinguistics which involved the use of nonspeech sounds for communication. Specifically, we looked at the frequency of laughing and sound effects produced during conversation. Ten participants, five with Williams syndrome and five typically developing peers, individually talked with a graduate clinician on a topic of their interest. The conversations were analyzed for the frequency of laughing and sound effects and the proportion of laughing and sound effects (e.g., # of occurrences of laughter/# of sentences).

The results will be discussed in light of the commonly held impression that speakers with Williams syndrome are involved, engaged, and charming.

SIMPLE FORMULATIONS OF THERMODYNAMIC PROPERTIES

Christopher Wagner (Mechanical Engineering)

Patrick Tebbe, Faculty Mentor (Mechanical Engineering)

This presentation will explain the methods used and the results of finding simple formulations of thermodynamic properties that can be used for various Mechanical Engineering applications. There are formulations available for thermodynamic properties of steam and various refrigerants, however, they are overly complex. This research concerns finding simple formulations using Matlab’s polyfit function and performing error analysis with Microsoft Excel. The error analysis was used to suggest alternative formulations such as different functional formats, combinations of equations, and use of the ideal gas law with compressibility.

Poster Session B

1. **Angelique DuCharme and Charity Zabel (M. Hart)** *Characterization of Proteins Interacting with the Alpha Subunit of Actin Capping Protein*
2. **Christopher Kniffen (C. Ruhland)** *The Effects of Drought and Temperature Stress on the Competitive Interactions of Smooth Brome (*Bromus inermis* Leyss.) and Little Bluestem (*Schizachyrim scoparium* Michx.)*
3. **Brady Bulian (D. Wrigley)** *Impact Of Antibiotic Therapy On Regeneration Following Caudal Amputation In The Earthworm*
4. **Dave Johnson, Jolene Smith, Ken Willaert (M. Bentley)** *Morphological Differences in Renal Vasculature of Hypertensive and Normal Rats*
5. **Melissa Serreyn (M. Hart)** *Determination of Protein Expressoin in Transgenic Mice*
6. **Jessica Biever (C. Ruhland)** *The Effects of Soil Salinity on Glycine May Proline Concentration, Photosynthesis And Biomass Production In Glycine Max*
7. **Jonathan Hammer (P. Knoblich)** *Effects Of Surgically-Induced Low Aldosterone On Blood Pressure Of Rats*
8. **Katherine Baier, Rachel Valesano and Lucia Rhodes (S. Fredstrom)** *Dietary Assessment of Underclass Students in Residence Halls*
9. **Benjamin Sticha, Lauren Haverstock (P. Knoblich)** *Offspring Effect of Impaired Aldosterone Secretion During Pregnancy in the Spontaneously Hypertensive Rat (SHR)*
10. **Ashley Jay, Dan Krause, Matt McMurtry, Terra Sandquist and Sara Halverson (S. Lee)** *A Study of Steroid Use in Sports*

CHARACTERIZATION OF PROTEINS INTERACTING WITH THE ALPHA SUBUNIT OF ACTIN CAPPING PROTEIN

Angelique DuCharme (Biological Sciences)

Charity Zabel (Biological Sciences)

Marilyn Hart, Faculty Mentor (Biological Sciences)

Actin, a filamentous component of all cells, contributes to cell shape, cell motility and force transmission. Actin assembly and dynamics are regulated by a diverse array of regulatory proteins, including actin capping protein (CP). CP is a heterodimeric protein composed of two subunits, alpha (α) and beta (β). Three isoforms of each subunit exist in eukaryotes. The β isoforms have been shown to have distinct functions *in vivo*. The functions of the specific α isoforms have yet to be determined. Overall, the amino acid sequence of the α isoforms are highly conserved, sharing approximately 90% sequence identity. The region of divergence is also highly conserved among higher organisms, suggesting that the alpha isoforms have distinct functions *in vivo*. We hypothesize that the alpha isoforms perform different functions in cells/tissues. The purpose of this research is to investigate the function of the alpha proteins of CP by identifying proteins that interact with the $\alpha 1$ and $\alpha 2$ subunits. In a previous yeast two hybrid genetic screen, potential interacting proteins were identified. Our goal is to characterize these proteins via plasmid sizing and sequence analysis. We have purified the plasmid DNA, transformed into competent *E. coli*, and plated onto selective media to isolate the plasmid of interest. The plasmid was purified and the insert amplified using Polymerase Chain Reaction (PCR). Duplicates were identified and the unique DNA fragments will be sent to the University of Minnesota Sequencing Center for subsequent analysis.

THE EFFECTS OF TEMPERATURE ON THE COMPETITIVE INTERACTIONS OF *Bromus inermis* AND *Andropogon gerardii*

Christopher D. Kniffen (Biological Sciences)

Christopher T. Ruhland, Faculty Mentor (Biological Sciences)

Invasive species are widely recognized globally for reducing biological diversity and threatening endangered and rare species. *Bromus inermis* (Smooth Brome) was introduced into the United States in the late 1800s to help alleviate erosion. In the past several years *B. inermis* has expanded its range creating monocultures that reduce overall diversity in the remaining tall grass prairie. In this study, we focused on physiological mechanisms responsible for competitive interactions between the invasive *B. inermis* and *Andropogon gerardii* (Big Bluestem; a native grass) under two different temperature regimes. Plants were grown intra- and interspecifically at 20 and 25° C for ten weeks in pots placed in environmental chambers. We examined leaf photosynthesis, transpiration, stomatal conductance and internal CO₂ concentrations using an infrared gas analyzer. We also measured xylem water potential using a Scholander pressure bomb. Interspecific competition resulted in large reductions in the biomass of *B. inermis* than when grown intraspecifically at both 20 and 25° C. Transpiration rates of *B. inermis* were 42 and 24% higher than those of *A. gerardii* at 20 and 25° C, respectively. In addition, leaf water potential of *B. inermis* was 49% more negative than *A. gerardii*. We suspect that the increased competitive ability of *A. gerardii* results from a greater water use efficiency than *B. inermis* (based upon transpiration, photosynthesis and stomatal conductance measurements). Our results suggest that future increases in air temperature may alter the competitive balance between these two species, however uncertainties regarding future changes in precipitation may overshadow these temperature effects.

IMPACT OF ANTIBIOTIC THERAPY ON REGENERATION FOLLOWING CAUDAL AMPUTATION IN THE EARTHWORM

Brady Bulian (Biological Sciences)

Dorothy Wrigley, Faculty Mentor (Biological Sciences)

Antibiotic treatment is commonly used to prevent infection during surgery. The degree and duration of antibiotic treatment, however, are open to further study. This study addressed the impact of antibiotic therapy on tissue repair in a caudal amputation earthworm model. Four groups of six worms each underwent amputation and each group was treated differently. Group 1 was the control group which received no antibiotic treatment before or after amputation. Group 2 received antibiotic treatment for 3 hours prior to amputation, and no treatment thereafter. Group 3 received no treatment prior to amputation, but was treated with antibiotic for a 24 hour time period each subsequent week of the study. Group 4 received antibiotic treatment for 2 hours prior to amputation, and received continuous antibiotic treatment over the entire course of the study. The re-growth of the tail was assessed over the next seven weeks by measuring the regenerated tail length and the weight gain by the worms. Data will be presented that shows that pretreatment with antibiotics aided regrowth of tail. Tail growth appeared to go through 3 stages based on rate of growth. Weight changes did not parallel tail regrowth. Further study would examine the impact of antibiotic therapy at the different stages of growth.

MORPHOLOGICAL DIFFERENCES IN THE RENAL VASCULATURE OF HYPERTENSIVE AND NORMAL RATS

Dave Johnson (Biological Sciences)

Jolene Smith (Biological Sciences)

Ken Willaert (Biological Sciences)

Michael Bentley, Faculty Mentor (Biological Sciences)

In human hypertension there are physiological changes in the kidney. The Spontaneously Hypertensive Rat (SHR) is a genetic strain of rat that develops hypertension similar to humans. Using these Spontaneously Hypertensive Rats (SHRs), we explored the differences in kidney morphology between normal and SHRs. In order to study kidney vasculature, the rats were first anesthetized and a catheter was placed into the aorta. Mercor plastic was then infused into the vasculature of the kidney and allowed to polymerize. The kidneys were removed and placed in a concentrated base or enzyme solution to remove the surrounding tissue leaving an exact plastic cast of the internal circulatory structures of the kidney. Samples were then prepared for examination by scanning electron microscopy. A computer program was used in conjunction with microscopy to provide quantifiable data on the physical features of the casts. Both inner and outer cortical glomeruli were examined and their afferent arterioles were measured. Preliminary results revealed a smaller diameter of afferent arterioles in SHRs as compared to that of normal rats. These data suggest a link between renal morphology and hypertension.

DETERMINATION OF PROTEIN EXPRESSION IN TRANSGENIC MICE

Melissa Serreyn (Biological Sciences)

Marilyn Hart, Faculty Mentor (Biological Sciences)

Actin contributes to the movement and shape of eukaryotic cells and maintains organized structure necessary for the function of striated muscle. Actin is regulated by a variety of accessory proteins including actin capping proteins (CP). CP is composed of an alpha (α) and beta (β) subunit. In eukaryotes, there are three alpha subunits, $\alpha 1$, $\alpha 2$, $\alpha 3$, and three beta subunits, $\beta 1$, $\beta 2$, and $\beta 3$. To elucidate the function of the beta subunits, transgenic mice were generated that lead to a decrease in expression of the $\beta 1$ subunit. In preliminary studies, the level of CP $\beta 1$ in three month old transgenic mice hearts was reduced approximately two fold relative to wildtype hearts. To confirm and extend these studies, we determined the level of expression of CP $\beta 1$, CP $\beta 2$, actin and CP α in transgenic hearts. Hearts from transgenic and wildtype mice at 3, 6, 9, and 12 months post gestation were pulverized in liquid nitrogen, solubilized in sodium dodecyl sulfate (SDS) sample buffer, and the proteins separated via SDS polyacrylamide gel electrophoresis. The separated proteins were quantitated via densitometry to ensure a constant load of protein. The proteins were transferred to nitrocellulose and probed with antibodies including anti-actin, anti-pan α , anti- $\beta 1$, and anti- $\beta 2$. The antibody:protein complex was visualized through the use of a secondary antibody labeled with alkaline phosphatase which allowed for a visible precipitate upon reaction with its substrate. The immune complexes were quantitated via densitometry. This information will be useful to correlate the level of expression with the phenotypes of the transgenic mice.

THE EFFECTS OF SOIL SALINITY ON PROLINE CONCENTRATIONS, PHOTOSYNTHESIS AND BIOMASS PRODUCTION IN GLYCINE MAX

Jessica Biever (Plant Science & Environmental Science)

Christopher T. Ruhland, Faculty Mentor (Biological Sciences)

Soil salinity can reduce growth in many plant species and is a major cause for the reduction in yield of many agricultural crops. High concentrations of salt ions in soil lower the osmotic potential and can potentially reduce water uptake by plants. In addition, dissolved salt ions can inactivate enzymes, reduce protein synthesis and inhibit photosynthesis resulting in reductions in growth. In some species of plants the amino acid proline may act as an osmolyte and reduce the effects of high salt concentrations. We examined the effect of salt on the productivity of *Glycine max* (soybean) in a greenhouse experiment. Plants were acclimated to greenhouse conditions for two weeks prior to the applications of our salt solutions. Our treatments consisted of applying four salt concentrations to plants on a weekly basis: distilled water (control), 50, 100 and 300 mM sodium chloride (NaCl) solutions. After three weeks of application, low levels of NaCl (50 mM) slightly stimulated plant height while the two higher levels of salt significantly reduced leaf number by up to 32%. Increased salt concentrations did not significantly alter dark-adapted maximum photochemical yield of photosystem II (F_v/F_m) between treatments. However there was a 44% reduction in the light-adapted quantum yield of photosystem II (Φ_{PSII}). These results suggest impairment in the photosynthetic process that is not directly associated with photosystem II integrity. We plan to harvest our plants at the end of the experiment and examine whole-plant concentrations of proline and soluble carbohydrates and measure biomass production

EFFECTS OF SURGICALLY-INDUCED LOW ALDOSTERONE ON BLOOD PRESSURE OF RATS

Jonathan Hammer, (Biological Sciences)

Penny Knoblich, Faculty Mentor (Biological Sciences)

This research examined the role between the hormone aldosterone and blood pressure in spontaneously hypertensive rats (SHR) and the genetically related normotensive Wistar-Kyoto (WKY) rats. Aldosterone is a hormone produced in the outer layer of the adrenal cortex, which is largely responsible for regulation of blood sodium and potassium ion concentrations. Aldosterone causes the kidneys to retain more sodium within the body. The blood sodium ion concentration is directly responsible for blood volume. When more sodium is retained in the body, more water is retained by the kidneys, balancing ion concentration. This increase in water retention increases blood volume and blood pressure. This research was designed determine if a long-term link exists between blood pressure and aldosterone levels, leading to a better understanding of cardiovascular development and the development of hypertension. Using five to six-week-old male and female rats, surgical operations consisted of either an adrenal freezing procedure or a sham operation. For the adrenal-frozen rats, the outer adrenal cortex was frozen on one of the glands, and the other gland was completely removed. Sham operations did not involve any changes to the adrenal glands. All rats were then allowed two weeks to recover. From 7 to 23 weeks of age, biweekly measurements were taken of weight, systolic blood pressure, and heart rate. No significant difference was found between adrenal frozen and sham treated male and female SHR in systolic blood pressure, heart rate, or weight gain. Data collection for WKY rats is ongoing.

DIETARY ASSESSMENT OF UNDERCLASS STUDENTS IN RESIDENCE HALLS

Katherine Baier (Family Consumer Science)

Rachel Valesano (Family Consumer Science)

Lucia Rhodes (Family Consumer Science)

Sue Fredstrom, Faculty Mentor (Family Consumer Science)

Students attending college have a wide variety of eating habits, many of which are not good for their health. Fifty students, all from one section of Nutrition I, were asked to keep a record of their food intake for three days, and asked to fill out a survey on their diets. The subjects then met with a dietetic student for a short interview to go over the diet record and take height and weight measurements. The information given in the three-day diet record was then entered into the Food Processor computer program to be analyzed. Results showed that many students are not getting balanced diets and often do not consume as much of several nutrients as they need. In a previous study, students living off campus had intakes low in fruits, vegetables, and dairy. Thus far, our results show similar poor intakes of fruits and vegetables for current on-campus students, even though their meals are provided in the dining centers. Further analysis of the intake records is planned.

OFFSPRING EFFECTS OF IMPAIRED ALDOSTERONE SECRETION DURING PREGNANCY IN THE SPONTANEOUSLY HYPERTENSIVE RAT (SHR)

Benjamin Sticha (Biological Sciences)

Lauren Haverstock (Biological Sciences)

Penny Knoblich, Faculty Mentor (Biological Sciences)

The adrenal gland produces two major hormones believed to be involved in hypertension. Aldosterone is secreted from the zona glomerulosa cells of the outer layer of the adrenal cortex. Aldosterone acts on the kidney's tubules to increase sodium reabsorption, thus raising total body sodium, blood volume, and blood pressure. Aldosterone has been implicated in the development of hypertension in humans and in animal models, such as the development of spontaneously hypertensive rat (SHR), a rat model of hypertension. Corticosterone, a hormone secreted by the second layer of the adrenal gland, has also been deemed necessary in the development of hypertension in the SHR. The removal of one adrenal gland and the freezing of the outer layer of the remaining adrenal cortex have advantages over previously used methods, such as adrenalectomy or pharmacological blocking agents. Adrenalectomy completely eliminates all adrenal hormones. Mineralocorticoid receptor blocking agents, such as spironolactone, are non specific, and produce undesirable side effects. The purpose of the present study was to investigate reduced adrenal hormone levels in the pregnant SHR as to the long term effects on the offspring growth and blood pressure. At 8 weeks of age, females had either the adrenal-freezing surgery, or the sham surgery, and were allowed 7-10 days to recover. Rats were mated and allowed to raise the litters undisturbed. From 5-25 weeks of age, two male, and two female offspring from each litter were subjected to biweekly measurements of weight, systolic blood pressure, and heart rate.

A STUDY OF STEROID USE IN SPORTS

Terra Sandquist (Human Performance)

Ashley Jay (Human Performance)

Dan Krause (Human Performance)

Matt McMurtry (Human Performance)

Sara Halverson (Human Performance)

Soonhwan Lee, Faculty Mentor (Human Performance)

Steroid abuse is a controversial topic of discussion in sport business. This study was designed to examine steroid abuse and regulations in sport business. Areas of focus are; the sports with the highest steroid abuse, regulations of steroid abuse, testing for steroids, health risks involved in steroid abuse, the availability of steroids, and the impacts on attendance rates. These topics were broken down the areas of high school sports, college sports, and professional sports. Results of this study suggest the pandemic of steroid abuse in today's sport business of late.

Poster Session C

1. **Lindsey Thisius (J. Buchanan)** *Assessing Value In Individuals With Early Stage Alzheimers Disease*
2. **Samantha Severson (D. Morano)** *Photographic Alternative Processes: An Exploration of Digital and Film Based Photography*
3. **Breanne Urban (G. Wenger)** *Bridging the Gap: Bringing Printmaking Into the Visual Arts Curriculum*
4. **Todd Grant (G. Holmes)** *The Role Of Greed And Deception In The Collapse Of Energy Giant Enron And What It Means For Kenneth Lay*
5. **Grant Anderson (Brian Klosa)** *The Intertextuality of music*
6. **Daryl Lawrence (L. Witherell)** *Opposition to Catholic Emancipation within Great Britain, 1820-29*
7. **Rachel Bozhinova (R. Widner)** *Contribution of Articulatory Loop and the Visuo-Spatial Sketchpad to Age-Related Differences in the Processing of Rapidly Presented Visual Information*
8. **Erin Jaskulke and Mallory Zigan (S. Fredstrom)** *The Nutritional Impact of Campus Kitchens*

ASSESSING VALUES IN INDIVIDUALS WITH EARLY STAGE ALZHEIMER'S DISEASE

Lindsey A. Thisius (Psychology)

Jeffrey A. Buchanan, Faculty Mentor (Psychology)

Much of the literature on early-stage dementia deals with either the family members or the caregivers of the afflicted individual. The goal of this study was to contribute to the very limited amount of research on dementia from the perspective of the patient. The study had two purposes. The first was to examine the experience of living with early stage dementia from the patient's perspective. The other purpose was to evaluate the values of individuals with early stage dementia to obtain more information about what is important to the specific individual. A total of 8 individuals (5 men and 3 women) participated in the study, ranging in age from 61 to 94 years. All 8 individuals completed the survey about their values, constructed by the authors, and 5 of the 8 individuals participated in the interview portion of the study. The values survey included 22 values that participants were verbally asked to rate according to how important they were in their daily life. The values survey was completed twice, each time being one week apart. The interview portion consisted of questions regarding the experience of recognizing memory difficulties and its effect on the individual's daily life. Data analysis is currently underway and involves examining trends in the rating of values between participants as well as investigating themes present across participants in the interviews. Implications of this study may involve a better understanding of how dementia affects patients and how patients cope with dementia. In addition, having a better understanding of a patient's values may enhance professional caregivers' ability to have meaningful interactions with patients and provide better care.

PHOTOGRAPHIC ALTERNATIVE PROCESSES: AN EXPLORATION OF DIGITAL AND FILM BASED PHOTOGRAPHY

Samantha Severson (Art)

David Morano, Faculty Mentor (Art)

With digital photography thriving and traditional film processes beginning to fade out, this artist wanted to bring those two different techniques together to form photographs with a harmonious balance of both. The creative process consisted of generating a theme, producing film and digital based negatives, and using these negatives to form prints in both the darkroom and on the computer. Negatives were created using digital images and manipulated in the computer. They were then taken into the darkroom and printed using alternative printing techniques. Other negatives and prints were created by the camera and scanned into the computer, manipulated, and then reprinted. The result was images having both the feel of the new and traditional techniques.

BRIDGING THE GAP: BRINGING PRINTMAKING INTO THE VISUAL ARTS CURRICULUM

Breanne Urban (Art)

Gina Wenger, Faculty Mentor (Art)

Fine art printmaking processes provide students with unique, historically significant and contemporarily relevant experiences within the visual arts. This research was focused on filling the need for accessible, current, and relevant printmaking curriculum with product examples and creating a means to fulfill the National Standards for Arts education. Periodicals, professional journals, books, and exhibits of work were reviewed first in order to compile initial background information. Research then focused on interviews and correspondence with contemporary printmaking artists concerning their work. Once narrative and background information was collated, the curriculum was developed in the form of Discipline-Based Art Education (DBAE) reflecting the research conducted through the project providing prospective students instruction and experience with history, criticism, aesthetics and production / processes. The curriculum includes study and examples of both historical and contemporary printmakers. Finally, sample artworks were completed to illustrate the production related portions of lessons included in the curriculum and to establish means of reflecting on and revising the lesson plans created.

THE ROLE OF GREED & DECEPTION IN THE COLLAPSE OF ENERGY GIANT ENRON AND WHAT IT MEANS FOR KENNETH LAY

Todd Grant (Accounting / Finance)

Georgia Holmes, Faculty Mentor (Business Law)

Abuse of power, cover up and collapse of the nation's fifth largest corporation are possible additions for inclusion on Kenneth Lay's future resume. The former Enron executive has 11 criminal charges pending against him, including bank fraud, insider trading and making false statements. The SEC (Securities & Exchange Commission) is the regulatory body which enforces the Securities Act of 1933. The act has two basic objectives, (1) to require that investors receive financial and other significant information concerning securities being offered for public sale; and (2) to prohibit deceit, misrepresentations, and other fraud in the sale of securities. A primary means of accomplishing these goals is through the registration of public securities. A detailed analysis will be presented of the facts behind the charges against Ken Lay, the events that led up to Enron's collapse and possible political issues from the Enron scandal.

THE INTERTEXTUALITY OF MUSIC

Grant Anderson (Speech Communication)

Brian Klosa, Faculty Mentor (Speech Communication)

Everyone loves music. People may have different styles and tastes but the undeniable fact is people love music. However because of the auditory nature of music, describing and communicating the love of music can be often prove difficult. Audiences often need a bridge to help them with the verbal explanation of musical styles. Poetry is often utilized to provide concrete language choices for abstract items like music. The following oral presentation will encompass various poetic and musical selections to showcase the verbal form. Additionally, the researcher will incorporate theories of performance study and research into the performance to assist the audience in understanding and appreciating the inter-textuality of music and the spoken word.

OPPOSITION TO CATHOLIC EMANCIPATION WITHIN GREAT BRITAIN, 1820-29

Daryl R. Lawrence (History)

Larry L. Witherell, Faculty Mentor (History)

Catholics in England, and later Britain, were prohibited by law from doing many things since the 1550s. Beginning in the 1780s, these repressive laws were slowly stripped away by Parliament. The final laws were tackled in the 1820s, those barring Catholics from Parliament. Allowing Catholics the right to sit in Parliament was seen as dangerous to the Empire, as Catholics owed their allegiance to the Pope and not the King. Several bills were proposed to relieve the Catholics, but it was not until 1829 when they were given the right to sit in Parliament. This also repealed many restrictions placed on Catholics, leaving only a few discriminations against them in Britain. Although much has been written about the supporters of the emancipation movement, the opposition to the movement has not been fully investigated. Opposition came not only in the form of parliamentary roadblocks from both Tories and Whigs, but from the public opinion of Britain who viewed Catholic emancipation as a slippery slope of reform. Within the Government and Parliament, protest against Catholic emancipation took the form of personal communication, debates, and resignations. The public responded to reform with town meetings, rallies, and formal petitions to Parliament. This paper examined those who opposed Catholic emancipation, as well as why they did so and how this opposition was expressed. This project utilized as primary sources the Parliamentary debates, the London Times, and autobiographies and memoirs of those involved with the issue. Secondary sources used include various scholarly journals and books.

THE ARTICULATORY LOOP AND AGE-RELATED DIFFERENCES IN THE PROCESSING OF RAPIDLY PRESENTED VISUAL INFORMATION

Rachael Bozhinova (Psychology)

Robert L. Widner, Faculty Mentor (Psychology)

We know from unpublished work that visual information processing is negatively impacted during the early stages of Alzheimer's disease (AD). Recently we have observed age-related differences in the processing of rapidly presented visual information (e.g., letter presentations at 110 msec each) with older adults (mean age = 76) taking three times longer than young adults (mean age = 18). We know that as one ages there is a deterioration in working memory performance. Thus, in the present study we examined one component of working memory - the articulatory loop to determine its role in the observed age-related difference. Participants were asked to identify a single white letter embedded in a sequence of black letters with each letter appearing in the center of the monitor for 110 msec. Participants were asked to report the white letter and whether a probe item (a black 'X') followed the white letter (across trials probe was present half of the time). Half of the participants were required to repeat the word "the" at one second intervals until they reported the information whereas the remaining participants did not repeat the word. We observed that the processing rate mirrored that of older adults for those who repeated "the". Thus, it appears that the articulatory loop plays a significant role in the age-related differences observed in our lab. Our next step is to include mild AD patients to see if they produce a pattern similar to that observed by young adults who had the articulatory loop loaded (saying "the").

THE NUTRITIONAL IMPACT OF CAMPUS KITCHENS

Erin Jaskulke (Family Consumer Science)

Mallory Zigan (Family Consumer Science)

Sue Fredstrom, Faculty Mentor (Family Consumer Science)

Minnesota State University, Mankato, started a Campus Kitchens program this fall. Using foods donated from the residence halls, local restaurants, and individuals, plus some purchased items, students prepare meals for delivery to shelters and families in the area. This project studies the content of meals served from the CK program. Meals have consistently provided at least 1 serving daily of grains, fruit, vegetables and meat or substitute. Dairy servings may be provided in the form of cheese; milk is not included. Nutrient content of meals will be fully analyzed. We will explore the nutrient needs of recipients and the impact of those meals on recipients' nutritional status. Using direct observation during personal visits, phone interviews or completion of a mailed survey, actual intake from the CK meals will be calculated. The data collected in this study will define the nutritional impact of the CK project for recipients in Mankato. The extent of potential nutritional problems in the area may be better known.

Tuesday, April 25 Presenters

8:45 - 10:15 A.M.

Session J

CSU-253

**Session J - History, Anthropology, Sociology, Political Science,
and Humanities**

Moderator: Dr. Eiji Kawabata

Andrew Brown (R. Schirmer) *Pottery Analysis Of A Middle Woodlands Archaeological Site In Southern Minnesota*

Tysen Dauer (T. Hagen) *How Christians Deal With Times of Transition: Comparing and Contrasting the Fourth Century Basilica with the Modern Megachurch*

Jessica Carlson (S. Schalge) *Immigrants, Refugees and Intercultural Communication and Conflict with Property Owners and Managers in Mankato*

Gregory Boubel (E. Kawabata) *The Clash Of Expectations And The Origin Of The Cold War*

Nathan Meyer (S. Schalge) *Community Assistance For Refugees and Gender Roles: What Could Make This C.A.R. Run Better?*

Ryan Feldbrugge (R. Liebendorfer) *Intentionality in Kant and Wittgenstein*

POTTERY ANALYSIS OF A MIDDLE WOODLANDS ARCHAEOLOGICAL SITE IN SOUTHERN MINNESOTA

Andrew Brown (Anthropology)

Ronald Schirmer, Faculty Mentor (Anthropology)

The time period of the Middle Woodland era (200 BCE to 400 CE) was a time of great transition and change. The transition from hunter-gatherer subsistence to more settled, horticultural existence occurred throughout the Midwest and was shared in its own unique way by the Native American residents of Minnesota. Changes in pottery style vividly illustrate this transition, providing clear evidence of intercultural contact. Beginning in 1977, Richard Strachan from the Minnesota State University, Mankato excavated an archaeological site in Nicollet County, Minnesota. Artifacts at the site are believed to date to the Middle Woodland era, a time ripe with the construction of extensive earthworks and elaborate burials throughout the Midwest. Although Richard Strachan never completed his report on the site, there is abundant evidence of the site's complexity. The extensive amount and variety of pottery at the site demonstrates the repeated use of the site by multiple groups over time and suggests extensive cultural exchange (such as intermarriage or trade) between neighboring groups. The pottery analysis done on this site will help in answering questions about the rate of change in Minnesota and the extent of contact between Native American groups in Minnesota and the Midwest at large.

HOW CHRISTIANS DEAL WITH TIMES OF TRANSITION: COMPARING AND CONTRASTING THE FOURTH CENTURY BASILICA WITH THE MODERN MEGACHURCH

Tysen Dauer (Humanities)

Thomas Hagen, Faculty Mentor (Humanities)

Architecture provides a cultural window into peoples' thoughts, actions, and beliefs. This is especially true of religious architecture. The modern phenomenon of the "megachurch" has resulted from a period of transition for Christians which is strikingly similar to the situation which faced Christians in the 4th century A.D. How the early Christians dealt with their building needs and how modern Christians are dealing with theirs provides an insight into how both the practice of Christianity and the culture in which it is practiced has changed. Research showed that the situations in which these structures were built had much in common: a growing political acceptance, an explosion of converts to the church, and a desire to move from non-religious buildings (for the early Christians this was homes, for modern Christians it was schools, homes, and theaters) to buildings set aside primarily for religion. But whereas the basilica became a giant icon in itself the megachurch today tends to be "desacralized." That is, religious symbols and icons are kept to a bare minimum. The influence of politics, fellowship, missions, technology, theology, iconography, clergy/laity relations, and pop culture on the architecture of the megachurch show why and how Christians have dealt with these similar situations in such different ways.

IMMIGRANTS, REFUGEES, INTERCULTURAL CONFLICT AND COMMUNICATION WITH PROPERTY OWNERS AND MANAGERS IN MANKATO.

Jessica Carlson (Anthropology)

Susan Schalge, Faculty Mentor (Anthropology)

With the growing numbers of immigrants and refugees in the Mankato area, there is bound to be intercultural communication and conflict. I did qualitative research about "intercultural communication and conflict between immigrant/refugee tenants and their property owners/managers." This research consisted of interviewing immigrants, refugees, property managers/owners, and service providers who work with them. I used anthropological methods to view the situation from multiple perspectives. The main themes I looked at were the types of landlord/tenant relationships, miscommunication, and conflict. I obtained a range of results. Some tenants and landlords/property managers talked to each other often, and were at least civil. Some tenants found landlords/management to be nice and understanding. There were also instances of communicational difficulties and conflict, especially in communicating the housing contracts. I hope that this research sheds light on what occurred.

THE CLASH OF EXPECTATIONS AND THE ORIGIN OF THE COLD WAR

Gregory Boubel (Political Science and History)

Eiji Kawabata, Faculty Mentor (Political Science)

The need to understand the origin of the Cold War is as compelling as ever. Though the Cold War ended over a decade ago, hindsight compels us to reexamine long held assumptions about the conflict. Was it inevitable? When and why did it start? Why was it so severe?

This proposal aims to answer these questions by examining the origin of the Cold War through the application of structural realism. This framework, and its basis on power distribution at the system level, has proven to be greatly beneficial to Cold War studies. A paper using structural realism found the competitive behaviors of the Soviet Union and the United States as a natural and inevitable feature of a bipolar power distribution. With this established, the paper undertook a further analysis to explain the severity of Cold War tensions. For this, the paper examined the post-war visions of the United States and the Soviet Union as formulated between the period of 1943 and 1945. In comparing postwar visions to the conclusions reached through structural realism, the paper determined that neither country predicted a bipolar world. Thus, the paper concluded that while Cold War competition was inevitable, the two powers' misguided policies were the deciding factor in creating an unnecessarily intense and dangerous Cold War.

COMMUNITY ASSISTANCE FOR REFUGEES AND GENDER ROLES: WHAT COULD MAKE THIS C.A.R. RUN BETTER?

Nathan E. Meyer (Anthropology)

Dr. Susan Schalge, Faculty Mentor, (Anthropology)

Community Assistance for Refugees is a non-profit service organization in downtown Mankato, Minnesota. Secondary migration to southern Minnesota has increased the refugee population as well as the need for research assessing the needs and concerns of refugees. The purpose of this project was two-fold: first to analyze how C.A.R. is able to meet the needs of its clients and second, to investigate ways in which C.A.R. could improve its services. Traditionally female refugees are less educated and less mainstreamed into American society. This research was designed to help all clients, but special attention was paid to the specific needs of female refugees. By conducting participant observations (volunteering at C.A.R. and recording observations) and ethnographic interviews (semi-structured, open-ended interviews) qualitative data was collected from clients and staff. The majority of clients interviewed were from East Africa and were fleeing violence. Paperwork issues (usually green card or citizenship applications) were the most common reason for client visits to C.A.R. Other client concerns included: language difficulties, discrimination, time management and weather. Staff interviews yielded a glimpse into the struggle of running a successful non-profit service organization. The difficulties and challenges of cross-gender/cross-cultural communication are discussed, as well as suggestions for more effective communication strategies. Finally, conclusions are offered that center on future research options, recommendations to C.A.R. and the Mankato community, and how gender roles have changed for refugees who have come to America.

INTENTIONALITY IN KANT AND WITTGENSTEIN

Ryan Feldbrugge (Philosophy)

Dr. Richard Liebendorfer, Faculty Mentor, (Philosophy)

How is thought about and experience of a world possible? This has been the framing question of the present work and it is generally understood as the problem of intentionality. The more specific problem dealt with has been whether or not intentionality has an internal structure that can be made explicit through science, particularly cognitive science. In his *Critique of Pure Reason*, Immanuel Kant outlines an internal, mental structure that, when imposed on our sensory data, makes thought about and experience of a world possible, which can be viewed as highly anticipatory of modern cognitive science. On the other hand, there are a number of philosophers who have it that the structure of intentionality cannot be made explicit nor can it be understood within science, notably Ludwig Wittgenstein. His later view is that the structure of intentionality can only be made sense of within the context of a shared, public language. If this is the case then it seems as if cognitive science ought to move on to a different problem. Exploration of the views of these two notable philosophers is critical if we are to come to a decision about the particular problem of the structure of intentionality, as well as the more general problem of intentionality. I have tried, in the present work, to make a case similar to that of Wittgenstein whereby all we have to do is look at the practices within our community of speakers to see the structure of intentionality.

Session K - Business**Moderator: Dr. Paul J. Brennan****Jessica Whitney, Jason Schilling, and Krista Gillen (D. Levin)** *How The 2003 HIPAA Laws Affected Chiropractic Clinics In The Mankato Area***Daniel Menke (G. Holmes)** *Airline Bankruptcy: The Abuse & Misuse of Bankruptcy Laws***Joe Hellman and Dan Ristau (I. Hwang)** *Responses Of Minnesota Accounting Firms On Sarbanes-Oxley***Joshua Randall, Seth Larson, and Stacy Novotny (K. Dale)** *Is It Really All About The Money: Motivating Employees In The 21st Century***Nida Sumar (M. Rolfes)** *Sarbanes Oxley Act - Section 404 Compliance And Review Assessment***Heidi Anderson, Christopher Stone, Matt Hanson, and Trang Mai (P. Herickhoff)** *Affinity Orientation In Employment And Labor Law*

HOW THE 2003 HIPAA LAWS AFFECTED CHIROPRACTIC CLINICS IN THE MANKATO AREA

Jessica Whitney (Biological Sciences)

Jason Schilling (Accounting)

Krista Gillen (Accounting)

Daniel Levin-Faculty Mentor (Accounting/Business Law)

In April of 2003, the Department of Health and Human Services (HHS) published new rules regarding the Health Information Portability and Accountability Act (HIPAA). The HIPAA was needed for two main reasons. The first was to standardize electronic and hard copy storage of personal health and financial data which improved the efficiency of data transportation. Also, increased assurance of confidentiality and security was needed. The HIPAA has affected every health care facility across the country including practitioner offices, insurance offices, and universities. The proposed research is designed to find out how the HIPAA laws have changed procedures of chiropractic clinics in the Mankato area. Large hospitals are capable of buying expensive equipment and programs to insure they are HIPAA compliant, but smaller health care facilities have used unique methods to stay compliant with the new rules. At the end of this project we will have shown how chiropractic clinics have been affected by the new laws. Our main objective is to have gathered enough information via interviews and research, to explain the HIPAA, why the HHS implemented these rules, and what procedures smaller businesses have used to comply with the new regulations.

AIRLINE BANKRUPTCY: THE ABUSE & MISUSE OF BANKRUPTCY LAWS

Dan Menke (School of Business)

Georgia Holmes, Faculty Mentor (School of Business)

Major airlines such as United Airlines and ATA Airlines that once filed for Chapter 11 bankruptcy are now in the clear, kind of. While it is a good thing that they have gotten out of the bankruptcy market, there are still major problems ahead for these companies. The loss of employees, pensions, & planes, a new set of rules will be set forth by United Airlines. Pay cuts are expected, and along with new rules for pensions, many will not be because of loopholes in the bankruptcy laws. Delta Airlines is a good example of using the "resource management tool" by cutting back on assets and still coming out of the "dog-fight" making money. There are major problems in this system, but the government has recognized this and is working to fix the issues.

RESPONSES OF MINNESOTA ACCOUNTING FIRMS ON SARBANES-OXLEY

Joe Hellman (Business)

Dan Ristau (Business)

Iny Hwang, Faculty Mentor (Business)

In July of 2002, President Bush signed an act in response to Enron and WorldCom. Sarbanes-Oxley has affected the way many businesses report financial statements. This is a big issue for all accountants today since the development of this law affects all accounting firms and the way CEOs and CFOs approve of the statements. We plan to email and call accounting firms in Minnesota to see how Sarbanes-Oxley has affected the way their company has to report. We also plan to see if the companies have had to hire any new employees or add any new departments. During our presentation we plan to explain what Sarbanes-Oxley is and present our results.

IS IT REALLY ALL ABOUT THE MONEY: MOTIVATING EMPLOYEES IN THE 21ST CENTURY

Joshua Randall (Management)

Stacy Novotny (Management)

Seth Larson (Management)

Kathleen Dale, Faculty Mentor (Management)

One definition of motivation is, "the forces within a person that affect his or her direction, intensity, and persistence of voluntary behavior." Although that does not mention monetary rewards, managers and leaders often believe that the best way to motivate others is by throwing money at them. This is simply untrue and the focus of this research presentation will be how to motivate others when you are not able to use money as a reward, because money is not always able to play a role in motivating employees. There are better ways to motivate employees, and as leaders, we need to know these ways before entering the workplace. This presentation will focus on areas of motivation such as how does technology affect motivation, how management affects workplace motivation, and the role goals play in motivation.

SARBANES-OXLEY ACT - SECTION 404 COMPLIANCE AND REVIEW ASSESSMENT

Nida Sumar (Accounting)

Mary Rolfes, Faculty Mentor (Accounting and Business Law)

The Sarbanes Oxley Act of 2002, enacted after the Enron and WorldCom scandals, is quite easily the most influential legislation that has been passed for the business world. Section 404 of this Act requires managers, internal auditors and external auditors to account for the effectiveness of internal controls as a part of each Annual Exchange Report which is a part of the Financial Report. Close to four years have passed since this Act has been enacted and deadlines for companies to comply with this Act have passed. At this point, professionals who deal with ensuring observance are well versed with what is expected and how it is to be done. However, many difficulties were faced initially and costs of compliance were high.

Although, the objective of this Act was to strengthen the reliability of financials and reduce opportunity for fraud, it is a complex Act and compliance has proven to be difficult. One wonders how effective the Act has been in achieving its objective. Are the costs of conformity still heavier than the benefits? Is this Act something that professional accountants and managers would want to live with?

The purpose of this research will be to find an answer to these questions with the help of primary and secondary research. Primary research will be conducted via questionnaires sent to accounting firms and accounting departments of companies and secondary research will consist mainly of reviews from professionals who are impacted by Sarbanes Oxley.

AFFINITY ORIENTATION IN EMPLOYMENT AND LABOR LAW

Heidi Anderson (Business Law)

Christopher Stone (Business Law)

Matt Hanson (Business Law)

Trang Mai (Business Law)

Penny Herickhoff, Faculty Mentor (Business Law-Accounting)

This research project was to create a Weblog to serve as a resource for students in the Business Law 452 class and was designed in conjunction with MSU's LGBTQQA (lesbian, gay, bisexual, transgender, queer, questioning, and allied individuals) center during the Spring 2006 semester. After conclusion of the class, the blog will be maintained and updated by the LGBTQQA center for their use in communicating with the LGBTQQA and MSU communities. This blog has served as a forum for discussion and resolution of issues in our campus community.

We have created the foundation for a service learning project with the LGBTQQA center on campus, focusing on affinity orientation in the workplace, government institutions, and educational facilities. Our resources, with the assistance of the LGBT center, have included documentaries, legal websites, personal interviews, and other resources.

This blog was styled to be an open communication forum. Any person could write to the blog editor in the question box, and all inquiries have been answered within 48 hours. We welcomed any other resources or contributions.

In the long term, we hope this blog will become an asset to Minnesota State University. Our priority in creating and developing this blog was not only for one class, but as an outreach to the entire MSU population.

Session L - Women Studies

Moderator: Dr. Susan Freeman

Alyssa Bischoff (S. Freeman) *Sexual Violence Education In Elementary Schools*

Amy Williams and Caroline Kessler (S. Freeman) *High Schoolers And Their Women: An Analysis Of Contemporary Literature Courses At Mankato Schools*

Christal Lustig (S. Freeman) *Men Teaching Men: Peer To Peer Violence Prevention In University Residence Halls*

Emily Haas (S. Freeman) *Hold The Discrimination: Effective Strategies For Preventing An Anti-Gay Amendment To The Minnesota Constitution*

Julie Kent (S. Freeman) *Are Women Getting The Lowest Price? Women's Access To Low Cost Birth Control Pills In Minnesota*

Kristen Trippe (S. Freeman) *So, What Are You Going To Do With That? A Look At Activism In The Lives Of Women's Studies Students*

Phillip Warren (S. Freeman) *Men Teaching Men: Peer To Peer Violence Prevention In Campus Ministry Organizations*

Sarah Groh (S. Freeman) *Do Only "Sluts" Talk About Sex? Young Women Discuss Sexuality*

Shayna Collins (S. Freeman) *Assessment Of Daycare Options For MSU Students With Children*

SEXUAL VIOLENCE EDUCATION IN ELEMENTARY SCHOOLS

Alyssa Bischoff (Sociology)

Susan Freeman, Faculty Mentor (Women's Studies)

When offered, sexual violence awareness education in elementary schools is usually taught once a year in a single lesson. Many programs neglect the latest scholarship about child sexual abuse and fail to provide practical information to the children. This study is a comparative analysis of sexual violence education curricula from three local elementary schools. The analysis evaluated messages within the curricula, including the extent to which the materials reinforced myths, stereotypes, and victim blaming. The results of this study were shared with the local schools, sent to the Sexual Violence Resource Center of Blue Earth County, and will be used to help create an out-of-school program for children to become more aware of sexual violence.

HIGH SCHOOLERS AND THEIR WOMEN: AN ANALYSIS OF CONTEMPORARY LITERATURE COURSES AT MANKATO HIGH SCHOOLS

Caroline Kessler (Sociology)

Amy Williams (Sociology)

Susan Freeman, Faculty Mentor (Women's Studies)

This project presents an analysis of the contemporary literature curriculum at Mankato high schools to determine the extent it incorporates novels about or by women. We examined school policy, evaluated the inclusion of women authors, and conducted a content analysis of the novels read by students at Mankato high schools to determine the presence of female characters and the gender roles provided. The benefits for students in a well-balanced literature class are high; however, these courses did not rise to the occasion. We have created a library display for local and school libraries to give access to positive female literature as well as developed reading guides to a selection of novels to create discussion on gender roles in these readings.

MEN TEACHING MEN: PEER TO PEER VIOLENCE PREVENTION IN UNIVERSITY RESIDENTIAL HALLS

Christal Lustig (Women's Studies)

Susan Freeman, Faculty Mentor (Women's Studies)

In an effort to increase sexual violence awareness and prevention among male students, I have collected teaching resources, formed contacts with community advisors, and conducted four small discussion groups consisting of five to twelve men residing in Minnesota State University, Mankato dormitories. I observed participants, requested evaluations of the sessions, and analyzed respondent evaluation forms for receptiveness to discussion of sexual violence and awareness. I found that while stereotypes of the Women's Studies Department made men apprehensive about participating, this did not indicate lack of male interest in sexual violence prevention. Small and informal groups can be implemented in residential halls to initiate discussion of sexual violence among men in the MSU community.

HOLD THE DISCRIMINATION: EFFECTIVE STRATEGIES FOR PREVENTING AN ANTI-GAY AMENDMENT TO THE MINNESOTA CONSTITUTION

Emily Haas (Women's Studies)

Susan Freeman, Faculty Mentor (Women's Studies)

Strong coalitions of activists have recently formed in Minnesota to campaign against the proposed discriminatory amendment prohibiting same-sex unions. In as few as 3-5 minutes of conversation, an activist has the potential to influence a voter's viewpoints. Through participatory research and surveys of an informal organization of activists in Mankato during spring 2006, I identified the most persuasive arguments that influenced individuals to vote against the amendment. Activists were most successful in changing voters' opinions when they shared their own personal testimonials as well as those of family members and friends. This allowed voters to clearly imagine how the consequences of the amendment would affect same-sex partners. The results of this study will assist activists in their future campaigning against the same-sex union amendment.

ARE WOMEN GETTING THE LOWEST PRICE? WOMEN'S ACCESS TO LOW COST BIRTH CONTROL PILLS IN MINNESOTA

Julie Kent (Women's Studies)

Susan Freeman, Faculty Mentor (Women's Studies)

Recently United States politicians have addressed the problem of women's access to low cost prescription birth control pills through private insurance companies across the United States. Only a few states have passed state laws to require private insurance companies to cover prescription birth control pills. Illinois state governor Rod R. Blagojevich in 2005 endorsed a campaign for women to obtain low cost birth control pills. To investigate the status of access in Minnesota, I have surveyed 20 heterosexual college women and reviewed 10 business insurance plans. With this information in hand, I contacted 15 Minnesota representatives from the state and local DFL party to assess their reaction to the Illinois program and their position on contraceptive access for Minnesota women. The project contributed to awareness of the need for Minnesota legislators to take action for women's health and contraceptive access.

SO, WHAT ARE YOU GOING TO DO WITH THAT? A LOOK AT ACTIVISM IN THE LIVES OF WOMEN'S STUDIES STUDENTS AND GRADUATES.

Kristen A. Trippe (Women's Studies)

Susan Freeman, Faculty Mentor (Women's Studies)

Many students at Minnesota State University, Mankato are interested in ways that they can become active and promote social change based on concepts delivered to them in the classroom. In an effort to promote action within our community and give perspective to students wondering how to apply the skills they have learned in Women's Studies classes, I have collected data from undergraduate and graduate students, as well as recent Women's Studies graduates, who are involved in community activism. Through interviewing ten people and examining their responses, various themes emerged about the ways in which feminist students and graduates engage in activism. Some of these themes included the frustrations involved in doing and organizing activism, practicing integrative activism, balancing another job with activist work, and negotiating community action around a family. Through analysis of these interviews, I illustrated how multiple qualities of activists' identities and values contribute to their struggles for social change. Using these results, I will create an online resource for the Women's Studies department to help answer the question, "So, what can I do with a degree in Women's Studies?"

MEN TEACHING MEN: PEER TO PEER VIOLENCE PREVENTION IN CAMPUS MINISTRY

Philip Cruise Warren (Women's Studies)

Susan Freeman, Faculty Mentor (Women's Studies)

In order to gather information on interest and effectiveness of an educational session for men on sexual violence with a goal of establishing material basis for future seminars at Minnesota State University, Mankato, I have engaged the local campus religious organizations with assisting me in organizing small group discussions with interested males. After analyzing prior educational materials, teaching resources and current research data, I used participant observation to assess the usefulness of such discussions. Specifically I conducted two sessions with the assistance of campus ministry services. While some denominations were more eager to participate than others, I found that religious organizations possess the power, leadership and active members to advertise and support continuing education on sexual violence and prevention and assist the proliferation of knowledge on these issues.

DO ONLY "SLUTS" TALK ABOUT SEX? YOUNG WOMEN DISCUSS SEXUALITY

Sarah Groh (English)

Susan Freeman, Faculty Mentor (Women's Studies)

Young American women often are uncomfortable discussing their sexuality despite media that portrays women's sexuality openly. I investigated what contributes to women's fears of openly discussing sex by talking to straight, bisexual, and lesbian college students. Three focus groups with 6 to 8 participants, ages 20 to 25, each discussed family, contraception, religion, relationships, and labeling, such as words like slut, dyke, and whore. The small group discussions, similar to consciousness-raising groups, allowed the women to learn from each others' perspectives. I found many women shared similar experiences that can be attributed to socially constructed sexual roles.

ASSESSMENT OF DAYCARE OPTIONS FOR MSU STUDENTS WITH CHILDREN

Shayna Collins (Social and Behavioral Sciences)

Susan Freeman, Faculty Mentor (Women's Studies)

Care giving is an important issue in society because it is an area that divides the sexes unfairly. A significant percentage of Minnesota State University, Mankato students have young children, and my interviews with ten student mothers illustrate that this campus population faces significant challenges. After researching the availability of daycare options at Minnesota State Mankato and contrasting this information with data from three other college daycare programs, as well as literature from the 1970s feminist daycare revolution, the evidence indicates that Minnesota State Mankato could become more competitive at recruiting a greater variety of potential students if they were to create a campus that is more inclusive of mothers. Efforts to help educate students about the challenges and options for parenting in college, as well as implementation of childcare alternatives could help minimize this problem.

Session M - Geography and Physics

Moderator: Dr. Changjoo Kim

Brandon Hughson (C. Kim) *Customer Spotting And Trade Area Analysis Of The YMCA Using GIS: A Case Study Of The Greater Mankato Area*

Je Moua (C. Kim) *Poverty In The Twin Cities Using GIS Studying*

Eric Raymer (I. Kogoutiuk) *Investigation of the Magnetic Properties of Strongly Correlated And Hybridized Electron Systems*

Steven Besser (H. Wu) *Interfacing and Establishing a Lab Station for Optoelectronic Measurements of OLEDs*

Jacob Simones (R. Palma) *Nitrogen and Noble Gas Content in Solar Wind Samples From the Genesis Spacecraft*

CUSTOMER SPOTTING AND SERVICE AREA ANALYSIS OF THE YMCA USING GIS: A CASE STUDY OF THE GREATER MANKATO AREA

Brandon Hughson (Geography)

Changjoo Kim, Faculty Mentor (Geography)

This research examines community accessibility to the YMCA facility for the Greater Mankato area. This study also attempts to map service area of the YMCA. For this study, membership datasets for the YMCA are geocoded and analyzed with Geographic Information System (GIS). Distribution of the YMCA membership shows how far people are willing to travel to use the YMCA. The result indicates that distinct individual accessibility patterns exist. The research also provides policy makers an opportunity for future planning and development initiatives.

STUDY OF POVERTY DISTRIBUTION IN THE TWIN CITIES METRO AREA USING GIS

Je Moua (Geography)

Changjoo Kim, Faculty Mentor (Geography)

Geographic Information Systems (GIS) allow easy comparison of spatial phenomenon with other variables and output the results onto maps which non-specialist audience can easily interpret and analyze. This study made an effort to understand the spatial distribution of poverty within the Twin Cities Metro Area. Poverty distribution is compared with but not limited to the selected variables such as education level, education funding, family size, family composition, infrastructure distribution, and illicit drugs. The Census 2000 family income variables have been analyzed and mapped using GIS. According to federal guidelines in 2000, the poverty threshold for a family of three was \$14,150. The poverty threshold for a family of four was \$17,050. Results showed the concentration of families living below federal poverty level is not evenly distributed. The correlation of this spatial distribution to that of the aforementioned variables can further be analyzed. Maps of these analyses can assist urban policy makers on development decisions and processes.

INVESTIGATION OF THE MAGNETIC PROPERTIES OF STRONGLY CORRELATED AND HYBRIDIZED ELECTRON SYSTEMS

Eric Raymer (Physics)

Igor Kogoutiuk, Faculty Mentor (Physics)

The magnetic and thermodynamic properties of strongly correlated and hybridized electron systems were investigated within the framework of the periodic Anderson model. A series of approximations were applied within the Green function method to obtain a system of self-consistent equations for chemical potential, orbital occupancies, and magnetic order parameters. The solution, found in the mean-field approach, showed that the energy spectrum of the model consists of two hybridized sub-bands, while application of the Hubbard I type decoupling led to the appearance of four energy sub-bands. It was also shown that in the half-filled symmetrical model the magnetization occurs above some critical value of the magnetic field reflecting the appearance of field-driven insulator-metal transition. In the non-half-filled systems the spontaneous ferromagnetic ordering exists in some temperature range, determined by the electronic concentration, f -level position and mixing parameters values. The present theoretical research could be applied for the explanation of existing experimental data of the magnetic behavior of the intermetallic compounds containing cerium, ytterbium, and uranium elements.

INTERFACING AND ESTABLISHING A LAB STATION FOR OPTOELECTRONIC MEASUREMENTS OF OLEDs.

Steven K. Besser (Physics and Astronomy)

Hai-Sheng Wu, Faculty Mentor (Physics and Astronomy)

Organic Light-Emitting Diode (OLED) research is vital to the advancement of display technology. The benefits of OLEDs over traditional light emitting diodes include less power draw, brighter displays, and longer life. The purpose of designing this lab station is to facilitate the research on the characterization of optoelectronic properties of LEDs and OLEDs. The major achievement of this work was in the development of VI (Virtual Instrumentation) programs using LabVIEW™ 7.1 to interface with various measuring instruments. The results of the measurements on the optoelectronic properties such as currents-voltage, current-luminance, voltage-luminance characteristics, and the emission spectra of LEDs and OLEDs are reported. The lab station has been tested and calibrated using blue, green, yellow, red and white colored LEDs. An OLED fabricated at Ames Lab, Iowa State University was characterized using this lab station and the results show that the measurement system is working properly.

NITROGEN AND NOBLE GAS CONTENT IN SOLAR WIND SAMPLES FROM THE GENESIS SPACECRAFT

Jacob Simones (Physics and Astronomy)

Russell Palma, Faculty Mentor (Physics and Astronomy)

Knowledge of the composition of the solar nebula is necessary in understanding how the solar system was formed. It is believed that the original composition of the solar nebula has been preserved in the outer layers of the sun, which is constantly being blown off in the form of solar wind. The collection and compositional analysis of the solar wind was the goal of NASA's Genesis Mission. In the current study, pieces of the spacecraft's gold foil collector were analyzed for nitrogen and noble gas (helium, neon and argon) isotopes. After the sample's gas was released, isotopic compositions were measured with a high-sensitivity mass spectrometer. Noble gas contents were determined by releasing the trapped gases from the foil through stepwise heating. A new mercury amalgamation process was used to release nitrogen from the foil. Some data obtained by these methods were inconsistent with results found in previous studies. The development of new measurement techniques and/or changes in the current ones may be needed in order to obtain precise and reproducible results that are adequate for modeling solar system evolution.

Session N - Computer Information Systems

Moderator: Dr. Ann Quade

Ben Sandmann (A. Quade) *Implementation of a Segmented, Transactional Database Caching System*

Ivan Marte, Tung Pham, and Alex Thom (C. Wightman and R. Bates) *Finite State Grammar Representations of a Military Communications Task for use in Automatic Speech Recognition*

Tung Pham (C. Wightman and R. Bates) *Converting Finite State Grammar Representations From XML To SLS Format For Use In Multiple Speech Recognition System*

Alex Thom and Ivan Marte (C. Wightman and R. Bates) *Comparisons Of Language Network Representations For A Constrained Vocabulary Speech Recognition Task Using Commercially Available Software*

IMPLEMENTATION OF A SEGMENTED, TRANSACTIONAL DATABASE CACHING SYSTEM

Benjamin J. Sandmann (Computer Science)

Ann Quade, Faculty Mentor (Computer Science)

Research on algorithms and concepts regarding memory-based data caching can help solve the performance bottleneck in current Database Management Systems. Problems such as data concurrency, persistent storage, and transaction management have limited most memory cache's capabilities. It has also been tough to develop a proper user-oriented and business friendly way of implementing such a system. The research of this project focused on code implementation, abstract methodologies and how to best prepare such an application for common business usage.

FINITE STATE GRAMMAR REPRESENTATIONS OF A MILITARY COMMUNICATIONS TASK FOR USE IN AUTOMATIC SPEECH RECOGNITION

Ivan Marte (Computer & Information Sciences)

Tung Pham (Computer & Information Sciences)

Alex Thom (Computer & Information Sciences)

Colin Wightman, Faculty Mentor (Computer & Information Sciences)

Rebecca Bates, Faculty Mentor (Computer & Information Sciences)

Recognizing speech in noisy environments is a difficult task. One way to simplify the solution is to work on a problem with constrained vocabulary and grammatical structure. This task involves a military command center interacting with ships. All speakers use a predetermined form for their utterances. A typical utterance in this task could be "Nine Two. This is Six Nine. Long Message. Over." followed by "This is Nine Two. Send. Over." This project involves constructing finite state grammar representations of this speech to be combined with acoustic models for automatic speech recognition. Training and testing are done with data generated using the unclassified military document ACP 125(F), "Communication Instructions Radiotelephone Procedure". This work involves identifying the overall grammatical structure and sub-grammars that can be used to specify repeated structures. The forms of some sub-grammars used will be presented.

CONVERTING FINITE STATE GRAMMAR REPRESENTATIONS FROM XML TO SLS FORMAT FOR USE IN MULTIPLE SPEECH RECOGNITION SYSTEMS

Tung Pham (Computer & Information Sciences)

Colin Wightman, Faculty Mentor (Computer & Information Sciences)

Rebecca Bates, Faculty Mentor (Computer & Information Sciences)

Rapid development of an automatic speech recognition system is constrained by the availability of software tools and format constraints for the statistical models used in the process. Development of models is often easier in one environment than another but the output may not be usable in all recognition systems. This project involves developing software tools to convert a file in XML (Extensible Markup Language) to a standard lattice format (SLS) so that it can be used as input to the HTK Hidden Markov Model Toolkit, an open-source speech recognition system. Information about the two formats and the process of conversion will be presented.

COMPARISONS OF LANGUAGE NETWORK REPRESENTATIONS FOR A CONSTRAINED VOCABULARY SPEECH RECOGNITION TASK USING COMMERCIALY AVAILABLE SOFTWARE

Alex Thom (Computer & Information Sciences)

Ivan Marte (Computer & Information Sciences)

Colin Wightman, Faculty Mentor (Computer & Information Sciences)

Rebecca Bates, Faculty Mentor (Computer & Information Sciences)

Speech recognition is the process of converting acoustic waveforms into text. This requires models that map acoustics to words and a language model that estimates the probabilities of hypothesized word sequences. Given a set of acoustic models, different language models can produce profoundly different recognition results. This work uses the Microsoft speech recognition engine that is available with Windows XP to recognize a set of test utterances from a military communications task. The engine comes with its own language model that is intended for use in general dictation applications. Even though this model was constructed with a large amount of training data, it is unlikely to perform well on the military task, which uses many word sequences that would be regarded as unlikely in typical office dictation. There is minimal training data available for developing a new language model for the military communications task so direct construction of a statistical language model is not feasible. For this particular application, the structure of the messages is well-known and highly-constrained. A finite-state network, which requires a relatively small amount of data to generate and which explicitly represents the constraints on the task, will replace the default language model in the recognition engine. Comparisons of the networks will be presented to show the effects of using a well-tuned model on the task.

Poster Session D

1. **Joshua Abraham (B. Groh)** *Analysis Of Banana Extract*
2. **Joseph Bequette (B. Groh)** *Simple And Effective Removal Of Organotin Compounds From Reaction Products*
3. **Benjamin Johnson (B. Hoppie and T. Vorlicek)** *Geochemical Assay Of Natural And Anthropogenic Processes Of A Large Prairie Pothole Lake*
4. **Stacy Werner (D. Quirk Dorr)** *Identification and Structural Characterization of the Major DNA-DNA Cross-Links of Anti Cancer Agent Thiophene NSC 652287*
5. **Heather Finch (D. Swart and J. Bailey)** *Detection of Lead in Bullet Wipe Using Sodium Rhodizonate*
6. **Ariel Howe (D. Swart)** *Kromoscopic Instrument Development And Detection Of Oxidation Damaged LDL And DNA*
7. **Gabriel Gehrke (M. Hart)** *Morphological Characterization of Genetically Altered Murine Hearts Using Scanning Electron Microscopy*
8. **Lakmini Weeramantri and Masahiro Kakizaki (T. Secott)** *Screening of Water for Fecal Contamination Using Human Fecal Anaerobe DNA as an Indicator*
9. **Robert Johnson (T. Secott)** *Use of Mycobacterim Smegmatis to Express a Recombinant Mycobacterial Protein*
10. **Aaron Peck (M. Hart)** *Affinity Purification of an Antibody*

ANALYSIS OF BANANA EXTRACT

Joshua M. Abraham (Organic Chemistry)

Brian Groh, Faculty Mentor (Organic Chemistry)

Many medicinal formulations made from extracts have been found to have beneficial properties of interest to the healthcare industry. To safely utilize these formulations and further extend their safe application it is important to understand the composition of these extracts. Knowing the composition of an extract will aid in determining specifically what constituents may be responsible for causing the desired effects. With this information, a more effective or concentrated form could be synthesized. Most commonly these materials are made of a variety of simple and complex organic compounds. This work will detail the analysis of a banana extract of particular interest to a local skin care company, the Coloplast Corporation. Isolation and identification of volatile and non-volatile organic components are key steps toward determining what the active components in the extract are. Isolation of significant extract constituents will be accomplished using chromatography and vacuum distillation. Modern chemical assays for proteins and carbohydrates as well as spectroscopic techniques including FTIR, NMR, and GC/MS will be used in the analysis of an extract. The results of our analyses will be reported.

SIMPLE AND EFFECTIVE REMOVAL OF ORGANOTIN COMPOUNDS FROM REACTION PRODUCTS

Joseph P. Bequette (Chemistry and Geology)

Brian L. Groh, Faculty Mentor (Chemistry and Geology)

Organotins have found widespread use in organic synthesis and the growth of their use will likely continue. Despite their popularity, reactions utilizing organotins nearly all suffer from the unfortunate formation of triorganotin halides or pseudo-halides as by-products that must be separated from reaction products often in stoichiometric amounts. In response to this problem there have been a variety of methods developed to separate organotin halides from the desired products though most are not general, mild, or cost effective. This report describes a method that utilizes polymer bound scavengers that remove at least 99% of the unwanted tins by filtration. The method is compatible with a variety of functional groups including aldehydes, ketones, esters, nitriles, alcohols, phenols, and ethers. Unwanted tins include organotin halides, hydrides, and distannoxanes. If desired, the scavenger can be easily regenerated and the tin halide recovered in high yield.

GEOCHEMICAL ASSAY OF NATURAL AND ANTHROPOGENIC PROCESSES OF A LARGE PRAIRIE POTHOLE LAKE

Benjamin J. Johnson (Chemistry and Geology)

Trent P. Vorlicek, Faculty Advisor (Chemistry)

Bryce W. Hoppie, Faculty Advisor (Geology)

Numerous natural and anthropogenic processes contribute to lake water quality. Lake Titloe, Sibley County, Minnesota, is one of the few remaining large shallow prairie pothole lakes in south central Minnesota. The lake possesses highly impaired water quality. Water samples and sediment cores were collected during abundant algal blooms and ice over conditions to characterize the concentration and position of nutrients and other contaminants. Elevated concentrations of total suspended solids (TSS) and total suspended volatile solids (TSVS) indicate the notable presence of both organic and inorganic particulates in the water. *In situ* analyses of the water show high concentrations of phosphate and nitrate within the water column, but further investigation by means of ion chromatography (IC) of filtered samples reveals greatly reduced concentrations of phosphate and nitrate. Covariance of high phosphate and nitrate concentrations with TSS and TSVS implies the organic and inorganic binding of the anions to the organic and inorganic particles. In the same analyses, the IC shows high concentrations of sulfate and chloride during both sampling periods in both the water column and sediment core and thus implies the system is well mixed. High concentrations of sulfate and chloride often correspond to strong anthropogenic contributions to the lake water. Outcomes of this research include: refined methods for future analysis of the water and sediment samples, streamlining the measurement of TSS and TSVS, and continued method development with the IC.

IDENTIFICATION AND STRUCTURAL CHARACTERIZATION OF THE MAJOR DNA-DNA CROSS-LINKS OF ANT-CANCER AGENT THIOPHENE NCS 652287

Stacey Werner (Chemistry)

Dana R. Quirk Dorr, Faculty Mentor (Chemistry)

Activated thiophene of NCS 652287 was synthesized using methodology cited in the literature for chemically similar thiophene derivatives, specifically 2,2' : 5',2''-terthiophene. The activated thiophene is proposed to fatally cross-link DNA in cancer cells and will be tested using specific DNA nucleobases. Thiophene derivatives have also been shown to have anti-microbial and anti-viral properties, as reported in the literature. These elements make activated thiophene derivative essential in the development of anti-cancer treatments.

DETECTION OF LEAD IN BULLET WIPE USING SODIUM RHODIZONATE

Heather Finch (Chemistry)

Daniel Swart, Faculty Mentor (Chemistry)

James Bailey, Faculty Mentor (Political Science & Law Enforcement)

The sodium rhodizonate spot test is commonly used as a verification test for the presence of lead, primarily for the detection of lead deposits on fabric as a result of firearm discharge. Upon treatment of the fabric with the light yellow sodium rhodizonate solution, a pink complex of lead forms. Further treatment of the sample with dilute hydrochloric acid produces a purple complex specific to lead. The first objective of this study has been to determine the limit of detection (LOD) of this test on white cotton fabric.

No research has been published using other rhodizonate salts for lead detection. It is known that sodium rhodizonate exhibits a separate color change (blue-violet) in the presence of calcium ions. It is proposed that using this dark calcium rhodizonate spray solution may exhibit a more contrasting background for the observation of the pink spots due to lead, especially on dark cloth. Upon synthesizing the calcium rhodizonate salt, tests were performed to compare the LOD of this high contrast test to the standard sodium rhodizonate test.

As previous studies have shown, sodium rhodizonate solutions are quickly reduced to tetrahydroxyquinone. When prepared in pH 2.8 buffer, the lifetime of the solution increases from one hour to approximately ten hours, as measured by UV-Vis spectroscopy. However, to date, no studies have estimated the 'usable' lifetime of rhodizonate solutions for visual forensic analysis. This study estimated this 'usable' lifetime of both the sodium and calcium salts via a time controlled set of visual analyses.

KROMOSCOPIC INSTRUMENT DEVELOPMENT AND DETECTION OF OXIDATION DAMAGED LDL AND DNA

Ariel Howe (Chemistry)

Daniel Swart, Faculty Mentor (Chemistry)

This experiment was designed to investigate the utility of the Kromoscopic™ technique in quantifying species such as oxidized LDL (ox-LDL) in human urine. One source of bio-oxidation stems from respired oxygen being partially reduced to form superoxide, a highly reactive oxygen free radical known to cause damage to both LDL and DNA. Previous studies have used this oxidation product of LDL as a metric for total oxidation occurring in the body.

While similar to spectroscopic techniques, which measure the entire spectrum diffusively, Kromoscopy(tm) uses a set of four spectrally overlapping “sensors”, each consisting of a broad filter monitored by a detector. This concept is based on the model of human color perception. Because overtone absorptions are spread throughout the NIR region, initial filter selections are spread evenly over the NIR from 700 to 1200 nm. This overlapping characteristic generates the techniques’ selectivity. Each “sensor” must monitor a region which is sufficiently overlapped so that the system can detect small absorption changes due to broad, weak overtones, while still monitoring a discrete zone. Also, the filters must be of sufficient transmittance to provide a high signal to noise ratio.

In order to explore the feasibility of quantifying ox-LDL in urine with this technique, the instrumental design must first be validated through measurements of a well-studied matrix/analyte combination. Initial characterization of the instrument design was carried out utilizing an in-vitro aqueous urea/glucose model. Upon validation, the instrument will be utilized in the measurement of the more complex and novel in-vitro urine/ox-LDL system.

MORPHOLOGICAL CHARACTERIZATION OF GENETICALLY ALTERED MURINE HEARTS USING SCANNING ELECTRON MICROSCOPY

Gabriel Gehrke (Biological Sciences)

Marilyn Hart, Faculty Mentor (Biological Sciences)

In striated muscle, the barbed ends of actin filaments are attached to Z lines. Biochemical and cell biological studies suggest that actin capping protein (CP) mediates this attachment by binding the barbed ends of actin filaments. Previous transgenic studies revealed that defective interaction between CP and actin filaments causes major structural defects in sarcomere organization, leading to cardiac hypertrophy and lethality. To determine the basis of the myofibril defect, we have examined the hearts of transgenic mice using scanning electron microscopy. Murine myocardium, both transgenic and wildtype were removed and fixed in 2% Paraformaldehyde/2% glutaraldehyde. A portion of the left ventricular wall, parallel to the papillary muscle, was further dissected and digested with collagenase (type I and II) to remove the extracellular matrix. The prepared tissue was dehydrated, critical point dried, gold coated and visualized using a JEOL jsm-35cf Scanning Electron Microscope and digital images captured using Scion Image acquisition software. The transgenic hearts were hypertrophied relative to wildtype and showed disorganized myofibrillar architecture.

SCREENING OF WATER FOR FECAL CONTAMINATION USING HUMAN FECAL ANAEROBE DNA AS AN INDICATOR

Lakmini Weeramantri (Biological Sciences)

Masahiro Kakizaki (Biological Sciences)

Timothy Secott, Faculty Member (Biological Sciences)

Fecal contamination of inland waters is a serious environmental problem across the United States and worldwide. Fecal pollution is associated with numerous negative impacts including human diseases and economic losses in industries using inland water sources. A reliable and efficient identification of sources of contamination is essential for resource management and elimination of fecal contamination in water. The use of members of the genera *Bacteroides* and *Prevotella*, obligate anaerobes belonging to the order Bacteroidetes that are abundant in the feces of warm-blooded animals, as indicators of fecal contamination may lead to the development of methods that rapidly, inexpensively and accurately identify the sources of fecal contamination. The goal of this investigation was to evaluate Polymerase Chain Reactions (PCRs) specific for Bacteroidetes as indicators of fecal contamination. 45 water samples collected from May through August 2005 were filtered, and DNA was extracted from material retained on the filter. DNA was amplified by PCR using Bacteroidetes-specific primers and a primer pair reported to be specific for Bacteroidetes of human origin. 18 out of 45 water samples yielded PCR products consistent with that predicted for Bacteroidetes. These results will be compared with those obtained from fecal coliform analysis. Potential correlation of these results with source temperature, flow rate, and time of sample collection will also be presented.

USE OF MYCOBACTERIUM SMEGMATIS TO EXPRESS A RECOMBINANT MYCOBACTERIAL PROTEIN

Robert Johnson (Biological Sciences)

Timothy Secott, Faculty Member (Biological Sciences)

Among the major goals of vaccine development are to produce products that are inexpensive, effective, and have few side effects. Protein products of pathogenic microorganisms may afford such opportunities, as subunit vaccines. It is often possible to express proteins of interest with catalog *Escherichia coli* strains. However, this process can be ineffective if the protein of interest comes from organisms such as *Mycobacterium spp.* that have a genome composition that is significantly different from that of *E.coli*. The purpose of this study was to attempt to use *Mycobacterium smegmatis* a non-pathogenic organism, to express a mycobacterial protein. We have cloned a histidine tagged *mce* gene (a potential virulence factor expressed by *Mycobacterium paratuberculosis*) into a mycobacterial shuttle plasmid. Protein gel electrophoresis and western blotting will be used to compare the expression of *mce* in *M. smegmatis* with that from a similar plasmid construct introduced into *E.coli*.

AFFINITY PURIFICATION OF AN ANTIBODY

Aaron C. Peck (Biological Sciences)

Marilyn Hart, Faculty Member (Biological Sciences)

Actin is a cytoplasmic filament that is present in all eukaryotic cells and contributes to cell shape, cell mobility, and to the organization of certain tissues such as striated muscle. Actin is regulated by accessory proteins including actin capping protein (CP) that serves to stabilize the actin filament and regulate its length. CP consists of two distinct protein subunits, an alpha (α) and a beta (β). Three α subunit isoforms ($\alpha 1$, $\alpha 2$, and $\alpha 3$) have been identified in vertebrates. We hypothesize that the alpha subunit isoforms have distinct functions within cells and tissues. We have generated alpha isoform specific rabbit polyclonal antibodies. To purify the antibodies, I generated a DNA construct containing the gene encoding the alpha 2 protein fused to glutathione S transferase. I overexpressed the fusion protein and am currently isolating the antibody from rabbit serum using affinity chromatography. Once the antibody is successfully isolated and purified, it can be used to investigate the location and function of the α subunit isoforms of actin capping protein in the cells and tissues.

Poster Session E

1. **Fiona Denge (T. Salerno)** *Examination of Proteins in Roundup Ready Soybean Seeds*
2. **Eminimoh Udomah (T. Salerno and P. Knoblich)** *Effects of Cryo-Destruction on 11 β -Hydroxysteroid Dehydrogenase Expression in Hypertensive Rats*
3. **Elizabeth Drommerhausen (J. Pribyl)** *Readability Level Of High School And College Chemistry Textbooks*
4. **Ian Lalich and Michelle Taylor (J. Pribyl)** *Identification Of The Correlation Between Student Self-Efficacy And Final Course Percentage In A General Chemistry Course*
5. **Jason Carver (M. Pomije)** *Stability and Structural Analysis of $[Pt(CNC_2H_3)_4][Pt(CN)_4]$ in Water and Ethanol*
6. **Jennifer Dahm (M. Pomije)** *Synthesis and Analysis of $[Pt((CH_3)_2CHNC)_4][Pt(CN)_4]$*
7. **Leila Erdmann (T. Vorlicek)** *The Influence of Clay Surfaces on the Fate of Antibiotics in Soil Systems*
8. **Jacob Davis and Megan Bohland (M. Hart)** *Immunolocalization of Actin in Transgenic and Wildtype Murine Myocardium*
9. **Rena Haycraft (S. Mercurio and D. Quirk Dorr)** *The Prevention Of Inflammatory-Related Liver Damage by Tamoxifen in Rats Given Fish Oil*
10. **Amanda Anderson, Danielle Husby and Jennifer Sellner (S. Lee)** *An Investigation Of Marketing Problems And Possible Solutions In The Women's National Basketball Association (WNBA)*

EXAMINATION OF PROTEINS IN ROUNDUP READY SOYBEAN SEEDS

Fiona Denge (Chemistry and Geology)

Theresa Salerno, Faculty Mentor (Chemistry and Geology)

Glyphosate is a non-selective herbicide used for weed control. The presence of glyphosate inhibits the shikimate pathway enzyme, 5-enolpyruvylshikimate 3-phosphate (EPSP) synthase, thereby preventing biosynthesis of aromatic amino acids that are required for normal plant growth. Roundup ready soybean plants have been genetically modified to make a different kind of EPSP synthase, one that is not inhibited by glyphosate. Several proteins exist in soybean seeds. By optimizing extraction conditions, several of these proteins can be analyzed by two dimensional (2D) electrophoresis which separates first by charge and second by size. This study tested the hypothesis that introduction of a new EPSP synthase might alter soybean seed protein 2-D electrophoresis patterns. Two dimensional patterns of control versus Roundup ready soybean seeds will be compared.

EFFECTS OF CYRO-DESTRUCTION ON 11 β -HYDROXYSTEROID DEHYDROGENASE EXPRESSION IN HYPERTENSIVE RATS

Eminimoh Udomah (Chemistry and Geology)

Theresa Salerno, Faculty Mentor (Chemistry and Geology)

Penny Knoblich, Faculty Mentor (Biological Sciences)

11 beta hydroxysteroid dehydrogenase (11 β HSD) is an enzyme that converts cortisol to cortisone. There are two isoforms of these enzymes (11 β HSD 1 and 2). 11 β HSD 2 preserves aldosterone specificity on the nonselective mineralocorticoid receptor by inactivating glucocorticoids locally. The partial or complete inhibition of the enzyme results in hypertension and hypokalemia due to over stimulation of the mineralocorticoid receptor by cortisol which circulates in much higher levels than aldosterone. The purpose of my research project was to study the expression of 11 β HSD 2 in the kidney of hypertensive rats who have had their adrenal cortex organs frozen. Previous work has shown that this decreases aldosterone levels. The effect on cortisone levels is unknown. The study examined whether the 11 β HSD 2 was expressed in the hypertensive rats and whether the cyrodestruction affected its expression. The expression of both 11 beta hydroxysteroid dehydrogenase isoforms was measured semi-quantitatively by first isolating total RNA from control and experimental rat kidneys. Next, cDNA was made from the total mRNA using oligo dT primers, and the cDNA was amplified specifically with primers designed for each of the two RNAs. The DNA pieces were sized by gel electrophoresis and quantitated using densitometry. The differences in HSD-2 RNA expression was normalized against the HSD 1 values. A comparison of HSD-2 RNA levels in the control kidneys versus those undergoing cryodestruction was made. The results and conclusions will be discussed.

READABILITY LEVELS OF HIGH SCHOOL AND COLLEGE CHEMISTRY TEXTBOOKS

Elizabeth A. Drommerhausen (Chemistry and Geology)

Jeffrey R. Pribyl, Faculty Mentor (Chemistry and Geology)

Textbooks are a large part of classrooms all over the world. In many science classes the textbook is frequently the determining factor for the content of a course. When choosing textbooks a factor that is often overlooked is the reading level, also known as the readability level. Chemistry textbooks typically are written at a reading level that is well above secondary students' or college students' abilities. Numerous high school and college chemistry textbooks were analyzed for their readability level using the Fry and Raygor readability graphs. The results of this work confirm that the readability level of chemistry textbooks is often times well above the target audience.

IDENTIFICATION OF THE CORRELATION BETWEEN STUDENT SELF-EFFICACY AND FINAL COURSE PERCENTAGE IN A GENERAL CHEMISTRY COURSE

Ian Lalich (Chemistry and Geology)

Michelle Taylor (Chemistry and Geology)

Jeffrey Pribyl, Faculty Advisor (Chemistry and Geology)

The focus of this study is to determine if a correlation exists between the level of student self-efficacy and student success in a semester-long general chemistry course. Students were asked to complete a survey at the beginning and at the end of their general chemistry (CHEM 201) course at Minnesota State University, Mankato. The level of student self-efficacy was measured using the College Academic Self Efficacy Scale (CASES) instrument and student success was determined using their final course percent score. A demographic survey, included with the instrument, was used to provide additional information to the researchers. Data analysis will be performed to allow for the correlation of self-efficacy levels and final course percents. It is anticipated that a positive correlation will be seen between a high level of student self-efficacy and a high final course percent score. The identification of a positive correlation between a high level of student self-efficacy and a high final course percent score could affect the formatting of the academic content of a course, as well as strategies for student help. Changes in these areas could then be formatted to increase student self-efficacy, which would increase overall course performance.

STABILITY AND STRUCTURAL ANALYSIS OF [Pt(CNC₂H₅)₄][Pt(CN)₄]

Jason Carver (Chemistry)

Marie Pomije, Faculty Mentor (Chemistry)

Platinum double-salts, such as [Pt(CNC₂H₅)₄][Pt(CN)₄], are fairly common in platinum (II) chemistry. Their structure consists of d⁸ square-planar ions stacked atop one another. Some of these square-planar platinum complexes exhibit the ability to detect volatile organic compounds (VOCs) by changing colors within the visual spectrum, and, when removed from the VOCs, return to their original state. These compounds are known as vapochromes. Some of these complexes, however, are unstable under specific conditions. Knowing the causes of these instabilities may help to improve upon future platinum double-salts or even to create a new class of vapochromes.

The platinum complex [Pt(CNC₂H₅)₄][Pt(CN)₄] was synthesized. An analysis of the stability and structure of this compound was carried out in a variety of solvents including water, ethanol, and dichloromethane. The characterization of this platinum complex was ascertained using ATR FTIR to monitor the changes of the complex in each solvent system.

SYNTHESIS AND ANALYSIS OF [Pt((CH₃)₂CHNC)₄][Pt(CN)₄]

Jennifer Dahm (Chemistry)

Marie Pomije, Faculty Mentor (Chemistry)

In this experiment a platinum-platinum double salt, [Pt((CH₃)₂CHNC)₄][Pt(CN)₄], was synthesized using two different methods. These compounds are of interest because of their vapochromic activity. Both salts will be analyzed over time by ATR FTIR. A comparison in the changes of the shifts in the (CH₃)₂CHNC and the CN stretching bands of both complexes, in different solvent systems will be presented. Potential solvents to be used are water, methanol, ethanol and dichloromethane. When [Pt((CH₃)₂CHNC)₄][Pt(CN)₄] was refluxed in water, a new compound was formed and analyzed.

THE INFLUENCE OF KAOLINITE ON THE FATE OF ERYTHROMYCIN IN SOIL ENVIRONMENTS

Leila Erdmann (Chemistry)

Trent Vorlicek, Faculty Mentor (Chemistry)

This project seeks to quantify the loss of erythromycin, a common antibiotic for animals and humans, as well as identify any degradation products caused by the surface of kaolinite, a common clay mineral. Antibiotics are commonly introduced into soil environments by treatment plant effluent and agricultural runoff. The introduction of antibiotics is of particular concern because it may promote microbial resistance. Clay minerals are known to adsorb organic molecules and promote their degradation. In order to gain insight into the nature of the clay/erythromycin interactions, experiments are designed to quantify the loss of erythromycin to kaolinite under environmentally relevant conditions. Gas Chromatography (GC) will be used to quantify erythromycin losses and to indicate any degradation products facilitated by the clay surface. These data will be used to determine binding constants between the kaolinite and erythromycin. Gas Chromatography-Mass Spectrometry (GC-MS) will be used to identify any significant degradation products. Erythromycin was purchased commercially and recrystallized under various conditions using acetone. Currently, a GC method suitable for quantifying erythromycin is being developed.

IMMUNOLOCALIZATION OF ACTIN IN TRANSGENIC AND WILDTYPE MURINE MYOCARDIUM

Jacob T. Davis (Biological Sciences)

Meghan Bohland (Biological Sciences)

Marilyn C. Hart, Faculty Mentor (Biological Sciences)

In myocardium, actin and myosin filaments are organized into repeating units of sarcomeres, the basic unit of muscle contraction. Actin Capping Protein (CP) binds to the barbed ends of the actin filament at the Z-line, directing and maintaining the proper organization of the thin filament in the sarcomere. CP is a heterodimer composed of an alpha (α) and a beta (β) subunit. Muscle cells contain two β subunit isoforms, β 1 and β 2. The β 1 isoform is present at the Z line; the β 2 isoform is found elsewhere, including cell-cell junctions such as intercalated discs and myotendinous junctions and at the cortical regions underlying the plasma membrane in general. In previous studies, transgenic mice were generated that replaced the β 1 isoform of CP with the β 2 isoform of CP using the cardiac-specific promoter of the α -myosin heavy chain (α -MyHC) gene. We hypothesized that a decrease in β 1 expression will lead to a disorganized myofibrillar structure and that the disorganization will become increasingly severe as a function of murine age. Murine hearts were extracted, frozen in liquid nitrogen and rinsed with 1X Phosphate Buffer Saline (PBS). Frozen sections were prepared using a cryomicrotome and collected on gelatin coated slides. The tissue sections were fixed in 0.1% paraformaldehyde in PBS, quenched with ethanolamine, permeabilized with methanol, and washed in PBS. The sections were probed with mouse anti-actin primary antibody and anti-mouse IgG rhodamine conjugated secondary antibody. Our results support our hypothesis. Immunofluorescence studies revealed an increasing disorganization as a function of murine age.

THE PREVENTION OF INFLAMMATORY-RELATED LIVER DAMAGE BY TAMOXIFEN IN RATS GIVEN FISH OIL

Rena Haycraft (Biological Sciences)

Steven Mercurio, Faculty Mentor (Biological Sciences)

Dana R. Quirk Dorr, Faculty Mentor (Chemistry)

The focus of this research was to decrease inflammatory-related liver damage from tamoxifen in rats by adding fish oil to the diet. Tamoxifen causes a significant increase in inflammation in the liver. Inflammation increases with the production of prostaglandins by a metabolic pathway involving arachidonic acid. Cytochrome P450, the enzyme that metabolizes tamoxifen, also causes an increase in the production of prostaglandins. The increased inflammation is related to lipid accumulation and ultimately lipid peroxidation in the liver. Resulting damage in humans includes hepatic steatosis (fatty liver), nonalcoholic steatohepatitis (NASH), and cirrhosis. Fish oils rich in omega-3 fatty acids, including eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), should decrease inflammation by indirectly suppressing the production of prostaglandins. The metabolism of omega-3 fatty acids competitively suppresses the metabolic pathway that produces arachidonic acid, therefore decreasing prostaglandin production. Success of the experiment was determined by giving female rats a 7-day treatment of tamoxifen concomitantly with dietary fish oils. The viability of the treatment was estimated by testing lipid accumulation, cytochrome P450 levels, lipid peroxidation, protein quantities and degree of cirrhosis.

AN INVESTIGATION OF MARKETING PROBLEMS AND POSSIBLE SOLUTIONS IN THE WOMEN'S NATIONAL BASKETBALL ASSOCIATION (WNBA)

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The Women's National Basketball Association (WNBA) was formed in 1997 after a previous successful team at the 1996 Summer Olympics. It initially started with eight teams and has recently expanded to 14 teams. The National Basketball Association (NBA) team owners own the WNBA teams that are in the same locations except two independent teams, such as Connecticut Sun and Chicago Sky. The WNBA stresses three points: girl empowerment, family appropriate entertainment, and concern over available role models for children. There are currently 14 marketing partners that are teamed up with the WNBA. There are three target segments that represent 41% of the population in the WNBA market segmentations. They are the WNBAers, Urban Women, and Kid-centrics. However, there are some marketing problems that could be holding the league back from reaching its potential peak success in the WNBA. A few of those problems include lack of media coverage, ownership structure, and the previously failed leagues. It has to compete with the NBA, college basketball, overseas leagues, and other job opportunities for the players. Possible solutions for the marketing problem are more name recognition, reasonable size of target markets with no NBA teams, smaller venues, more local media coverage, and change of ownership structure. The further discussion for possible marketing solutions was discussed.

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