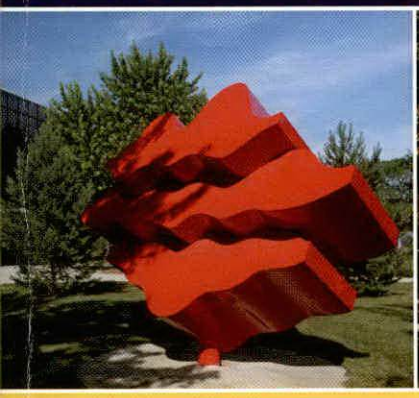
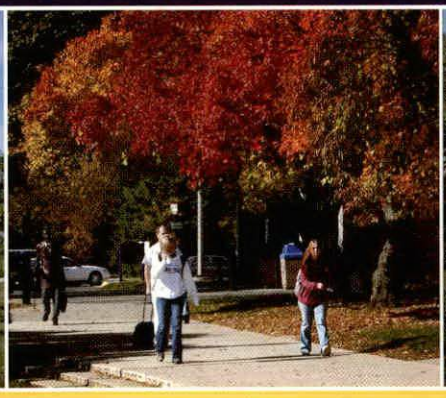
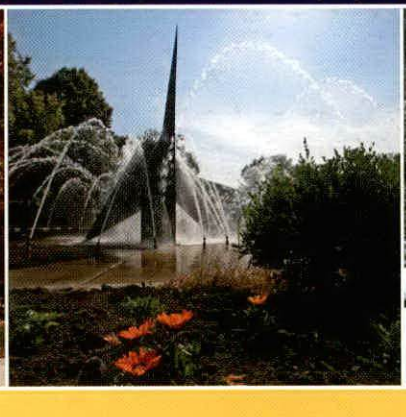
Minnesota State University Mankato


2007 UNDERGRADUATE RESEARCH CONFERENCE

April 23 & 24, 2007

MINNESOTA STATE UNIVERSITY
MANKATO

WELCOME

Welcome to the 9th annual Undergraduate Research Conference at Minnesota State University, Mankato. This conference provides an exciting opportunity for the University to showcase the research and creative activity of our undergraduate students. These projects, submitted by 186 students representing six colleges, are the result of collaboration between talented and motivated undergraduate students and their dedicated faculty mentors. This year there will be a total of 127 presentations affording a wide array of on-going, outstanding scholarly and creative activity on our campus. Abstracts of these oral, performance, or visual arts projects and posters accepted for presentation are contained in this formal publication. I applaud the work of these students and the 65 committed faculty members who served as mentors and encourage faculty, students, staff and guests to attend the formal presentations that will take place in the Centennial Student Union on April 23 and 24, 2007. Our vision to be known as a university where people expect to go further than they thought possible is clearly demonstrated by these students and faculty. The entire University community celebrates the achievements of these outstanding undergraduate students and congratulates all participating students and their faculty mentors.

Richard Davenport
President
Minnesota State University, Mankato

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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 Noble 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 faculty members and are identified by the URC Steering Committee. Winners are recognized in the URC online journal.
http://grad.mnsu.edu/research/urc/proceedings/archive/

URC SPECIAL THANKS

Richard Davenport – President
Scott Olson – Vice-President of Academic Affairs
Anne Blackhurst – Interim Dean College of Graduate Studies and Research
Michelle Carter – Interim Director College of Graduate Studies and Research
Trent Vorlicek & Gina Wenger – Co-Chairs of the Undergraduate Research Conference
Rachel Collins – Graduate Assistant of the Undergraduate Research Conference
Moderators and Judges
Minnesota State University, Mankato Foundation Grant Committee

Undergraduate Research Conference Committee Members: Dawn Albertson, Barbara Bergman, David Bissonette, Bradley Cook, Anne Dahlman, Lillian Duran, Paul Finnocchiaro, Iny Hwang, Diane Joseph, Kent Kalm, Andrea Rittman Lassiter, Vicki Luoma, Mark McCullough, Danae Quirk Dorr

Invited Luncheon Speakers: Dean Anne Blackhurst and National Conference Undergraduate Research Student Participants, Lisa Mayer and Gregory Boubel

Workshop Coordinators: Rebecca Bates, David Bissonette, Paul Finnocchiaro, Danae Quirk Dorr

**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 23	Schedule of Events	
8:00 - 4:30	Student Presenter, Moderator and Judge Check-in Coffee and Snacks Available	CSU Ballroom Entrance
8:00 - 5:30	Site Judges Gathering Room Open	CSU-244
8:15 - 9:45	Session 1: Automotive, Engineering and Technology	CSU 201
8:15 - 9:45	Session 2: Art and Art History	CSU 203
10:00 - 12:00	Session 3: Anthropology, Communication Disorders, Modern Languages and Early Childhood Studies	CSU 202
10:00-12:00	Session 4: Psychology	CSU 204
10:00 - 12:00	Session 5: Chemistry and Physics	CSU 255A/B
12:00 - 1:00	Lunch (on your own)	
1:00 - 2:30	Session 6: English, Philosophy and Political Science	CSU 201
1:00 - 3:00	Session 7: Women's Studies and Mass Communication	CSU 203
1:00 - 3:00	Poster Session A	CSU 253/4/5
1:00 - 3:00	Poster Session B	CSU 253/4/5
3:00 - 5:00	Session 8: Engineering, Math & Statistics and Computer Information Sciences	CSU 202

Tuesday, April 24	Schedule of Events	
8:00 - 11:30	Presenter Check-in	CSU Ballroom
8:00 -12:30	Site Judges Gathering Room Open	CSU 244
8:30 - 9:30	Session 9: Performing Arts	CSU 284
8:15 - 10:30	Session 10: Business and Marketing	CSU 201
8:15 - 9:45	Session 11: Biological Sciences and Human Performance	CSU 203
10:30 - 12:30	Poster Session C	CSU 253/4/5
10:30 - 12:30	Poster Session D	CSU 253/4/5
10:45 - 12:30	Session 12: History	CSU 202
10:30 - 12:30	Session 13: Women's Studies	CSU 204
1:00 - 2:00	**URC Luncheon and Award Ceremony**	**Center Ballroom**

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Monday April 23 Presenters

Session 1	8:15-9:45	CSU201

Automotive, Engineering and Technology

Integration of a Turbocharged Engine in a Formula SAE Car
Benjamin Reilly, Christopher Grasser, Patrick Lehmann, and Blake Rosengren (Department of Automotive Engineering Technology)
Professors Bruce Jones and Gary Mead, Faculty Mentors (Department of Automotive Engineering Technology)

Analysis of An E-85 Two-Stroke Semi-Direct Injected Snowmobile
Aaron Bowen and Stuart Boyd (Department of Automotive Engineering Technology)
Professor Bruce Jones, Faculty Mentor (Department of Automotive Engineering Technology)

Flex-Fuel Prius
Tony Reichel, Jacob Kriesel, Luke Markham, and Jon Liu (Department of Automotive Engineering Technology)
Professor Bruce Jones, Faculty Mentor (Department of Automotive Engineering Technology)

Building of a High Performance Chassis for a Formula SAE Car
Tim Quast, Joe Anderson, and Jacob Gillespie (Department of Automotive Engineering Technology)
Professor Gary Mead, Faculty Mentor (Department of Automotive Engineering Technology)

Constructing a Small Engine Dynamometer
Cory Barwald, Tony Dick, Brandon Kraemer, Branden Loesch, and Dan Prihoda (Department of Automotive Engineering Technology)
Professor Craig Evers, Faculty Mentor (Department of Automotive Engineering Technology)

Integration of a Turbocharged Engine in a Formula SAE Car

Benjamin Reilly (Department of Automotive Engineering Technology)
Christopher Grasser (Department of Automotive Engineering Technology)
Patrick Lehmann (Department of Automotive Engineering Technology)
Blake Rosengren (Department of Automotive Engineering Technology)
Professor Bruce Jones, Faculty Mentor (Department of Automotive Engineering Technology)
Professor Gary Mead, Faculty Mentor (Department of Automotive Engineering Technology)

This project concerns Minnesota State Mankato's entry in the Formula SAE competition. Formula SAE is a contest where 130 student teams from around the world design and build formula style race cars, and then compete for top honors. Included in this presentation is the near completed car, including selected engine, fabricated engine components, selected turbocharger, production cost, weight reduction, methods of engineering and modification results. The engine team focused efforts on a 2001 Honda F4i engine, mated to an IHI RHF4 turbocharger. A specialized intake and restrictor (required by FSAE rules) was designed in Pro/E cad software and built by Stratysis specifically for this application out of Polyphenylsulfone, a polymer with special mechanical and chemical characteristics. The engine was modified to run on E-85, and custom camshaft profiles were determined using Dynomation Engine Simulator. The engine was then tuned and tested to determine the affects of different intake designs and to test the actual results of different camshafts on a Superflow engine dynamometer. Also tested were torque and horsepower outputs as well as noise levels.

Analysis of An E-85 Two-Stroke Semi-Direct Injected Snowmobile

Aaron Bowen (Department of Automotive Engineering Technology)
Stuart Boyd (Department of Automotive Engineering Technology)
Professor Bruce Jones, Faculty Mentor (Department of Automotive Engineering Technology)

The project concerns the Minnesota State University Mankato Automotive Engineering Technology Program's entry to the 2007 Clean Snowmobile Challenge. Included in this presentation is the snowmobile model chosen for modification, engine choice, modifications applied, methods used, modification results affecting performance, emission control, noise reduction, production cost, durability, fuel efficiency, safety, and rider comfort. The Minnesota State Mankato Mavericks devoted their main focus for the 2007 Clean Snowmobile Challenge to convert a carbureted Arctic Cat 500 Saber Cat two-stroke engine to semi-direct injection (SDI). The engine was tested for emissions, noise, and performance; these test results were then analyzed for advantages and disadvantages.

Flex-Fuel Prius

Tony Reichel (Department of Automotive Engineering Technology)
Jacob Kriesel (Department of Automotive Engineering Technology)
Luke Markham (Department of Automotive Engineering Technology)
Jon Liu (Department of Automotive Engineering Technology)
Professor Bruce Jones, Faculty Mentor (Department of Automotive Engineering Technology)

The project involved the modification of a 2006 Toyota Prius into a "Flex-Fuel Hybrid Vehicle." Included within the presentation: testing procedures, available kits, E-85 information, fuel blending procedures, costs, fuel efficiency, emissions outcomes, drivability, performance, and final outcome. The team used the time and money donated to modify a Prius that will be able to use gasoline and E-85 in order to have cleaner emissions and to reduce the dependency on foreign oil. The vehicle was tested for emissions, fuel economy, and performance, including drivability. The results were then analyzed for advantages and disadvantages of the fuels used during the testing period with the Prius.

Building of a High Performance Chassis for a Formula SAE Car

Tim Quast (Department of Automotive Engineering Technology)
Joe Anderson (Department of Automotive Engineering Technology)
Jacob Gillespie (Department of Automotive Engineering Technology)
Professor Gary Mead, Faculty Mentor (Department of Automotive Engineering Technology)

The project concerns the Minnesota State University, Mankato Automotive Engineering Technology Program's entry to the 2007 Formula SAE competition. Formula SAE is a competition where 130 student teams from around the world design and build formula style race cars, and then compete in static and dynamic events. Frame, suspension, drivetrain, and brakes will be discussed to demonstrate how a high performance chassis is built. This includes the design goals, fabrication, analysis, and production costs. The team will also explain how different tests, calculations, and decision matrices were utilized to maximize efficiency, while reducing overall vehicle weight.

Constructing a Small Engine Dynamometer

Cory Barwald (Department of Automotive Engineering Technology)
Tony Dick (Department of Automotive Engineering Technology)
Brandon Kraemer (Department of Automotive Engineering Technology)
Branden Loesch (Department of Automotive Engineering Technology)
Dan Prihoda (Department of Automotive Engineering Technology)
Professor Craig Evers, Faculty Mentor (Department of Automotive Engineering Technology)

The project consisted of planning, designing and constructing a fully functional test stand for a 30 horse power DyneSystems Midwest Eddy Current Dynamometer. Included in this presentation will be an outline of how the team approached the project and a step-by-step process leading to completion. The main focus of the project was to construct an easy to use and adaptable small engine dynamometer test cell for future studies and projects using small gas or diesel engines.

Monday April 23 Presenters

Session 2	8:15-9:45	CSU 203

Art and Art History

Imminent Assimilation: A New Interpretation of Etruscan Cultural Material
Lisa M. Mayer (Department of Art)
Professor Alisa Eimen, Faculty Mentor (Department of Art)

The Virgin of Guadalupe: The Formation of the Mother of Modern Mexico
Alicia Seewald (Department of Art History)
Professor Aida Audeh, Faculty Mentor (Department of Art History)

An Internship in Art: Learning the Inner Workings of Life as a Professional Artist
Ian Laird, Melissa Seifert, and Chad Gunderson (Department of Art)
Professor Liz Miller, Faculty Mentor (Department of Art)

Reflections on Canvas: Caravaggio and the Development of Optical Style
Eleanor Rae Harper (Department of Art)
Professor Curt Germundson, Faculty Mentor (Department of Art)

Merging Glass with Ceramics
Casey R. Hochhalter (Department of Art)
Professor Les Laidlaw, Faculty Mentor (Department of Art)

Imminent Assimilation: A New Interpretation of Etruscan Cultural Material

Lisa M. Mayer (Department of Art)
Professor Alisa Eimen, Faculty Mentor (Department of Art)

Anthropologists and historians posit that cultural material can be used as a tool to measure geo-political stress on civilizations. I apply this theory to an ancient Italian culture known as the Etruscans (9th century BC to 1st century BC). Study of artistic production during years of increasing Roman contact makes it possible to identify common themes in Etruscan art, which symbolize the social concerns of a waning culture. Analysis of the effects of geo-political stress on artistic representation can determine to what extent an existing artistic practice assimilates ideas and motifs of a colonial power. In particular, this project determines the degree to which Etruscan art reflects social and political changes prior to its cultural decline engendered by increasing Roman dominance. By identifying the motifs used in artistic production during periods of historical conflict, it is possible to pinpoint socio-political events that likely affected artistic choices in subject matter. Using the Etruscan objects collected at Chicago's Field Museum, I conducted a thorough investigation to determine if Etruscan artists employed specific imagery to express changes in regional autonomy. Placing the museum's collection into this geo-political context provides a new perspective, emphasizing intrinsic artistic reaction to external pressures. By isolating objects that display concepts related to cultural identity, I reconsider the rate of Roman assimilation (260 BC to 88 BC).

This new approach to Etruscan research contributes to a broader sociological understanding of cultural assimilation and its effect on material production. This method contrasts with conventional art-historical scholarship, which generally favors Greco-Roman culture. The existence of an artistic record of assimilation that focuses on the Etruscans and documents an increasing shift in imagery confirms a social awareness of imminent assimilation. In addition it suggests another method of art-historical research, confirming that cultural material is a viable tool in identifying geo-political stress on ancient civilizations.

The Virgin of Guadalupe: The Formation of the Mother of Modern Mexico

Alicia Seewald (Department of Art History)
Professor Aida Audeh, Faculty Mentor (Department of Art History)

During the Spanish conquest of Latin America in the 16th Century, the indigenous peoples were confronted with powerful religious imagery communicating the ideologies of Christianity partnered with the infliction of severe violence. As one 19th Century essayist summarized "España conquistó América a cristazos" (Spain conquered America with blows of the crucifix). Scholarship suggests that colonization used a complex mix of force and persuasion to win over the native peoples. The colonizers also inserted their own ideologies into the daily lives of the colonized population through the use of art. The image of the Virgin of Guadalupe, developed out of the reformation of the image of the indigenous goddess Tonantzin, a goddess central to the beliefs of the indigenous populace, served just that purpose in the conquistadors' colonization of Latin America. However, even though the Virgin of Guadalupe was originally a tool of colonization, She became a symbol of empowerment and liberation for Mexico. This paper will explore the reasons behind the changes in the image of the Virgin from its origins in Europe to the beloved, dark-skinned image of the Virgin of Guadalupe. In order to understand the changes that the image of Mary underwent, we must consider what was happening in the religious art of Europe, particularly Spain, at this time, as well as in native Aztec art before the conquest. In addition to art historical method, this paper will utilize aspects of modern psychology and anthropology to explain the phenomenon of this iconographic change.

An Internship in Art: Learning the Inner Workings of Life as a Professional Artist

Ian Laird (Department of Art)
Melissa Seifert (Department of Art)
Chad Gunderson (Department of Art)
Professor Liz Miller, Faculty Mentor (Department of Art)

The stereotypical idea of the starving and misunderstood artist is an inaccurate view of the reality of being an artist. This semester, we have been employed by Liz Miller, Assistant Professor of Art. Throughout the semester, by working closely with Liz, we have been exposed to the unseen responsibilities there are in being a professional studio artist. There is much more to being an artist than just simply creating work; artists need to operate much like a business. Paperwork must be done for grants and show applications. The organization of slides and/or digital images is crucial for show applications as well as presentations. Having and maintaining a website is a key to success. Creative research for a project is as important as making the work itself. Working together and communicating is crucial for a work to be completed. Figuring out how to ship a work can present unforeseen problems. Finally, the installation of work in a gallery, as the culmination of all of these enterprises, provides an opportunity to work with gallery operators and interact with an audience. An internship like this illustrates the inner workings of the art world. At first glance, the term "Art Internship" may seem like an oxymoron, but it is anything but. An internship in the visual arts is an unequivocal experience and encouraging more of them is vastly important.

Reflections on Canvas: Caravaggio and the Development of Optical Style

Eleanor Rae Harper (Department of Art)
Professor Curt Germundson, Faculty Mentor (Department of Art)

At the height of his career, Baroque painter Michaelangelo de Mersi Caravaggio was revered for his ability to foster a heightened sense of realism never before seen upon the canvas. However, as recent scholarship and a renewed interest in the history of artistic methodology reveal, the artist may have utilized optical devices such as a single lens to project reflections of his subjects upon the canvas. Due to the limitations of such devices, spacial discontinuity and unnatural proportion are just two of the discrepancies which have affected the realism and overall unity of his artwork. Caravaggio worked with naturalism in mind and therefore would have used the optical device as an aid in heightening the realism of his work. While certain aspects of his paintings such as facial expression and light remained raw and naturalistic the overall unity of the works were compromised, consequentially creating fragmented spaces with subjects who were emotionally and physically disengaged from each other. These aspects can be attributed to the use of the lens, which was only capable of reflecting one figure at a time. Permeating Caravaggio's canvases these discrepancies also influenced his followers, the Caravaggisti. With noticeable visual elements recalling the effects of Caravaggio's optical device, his followers have adopted these discrepancies as stylistic traits within their paintings. This paper will examine Caravaggio's alleged use of optical devices and the subsequent effects which have impacted his followers.

Merging Glass with Ceramics

Casey R. Hochhalter (Department of Art)
Professor Les Laidlaw, Faculty Mentor (Department of Art)

The central idea of this creative project was to understand and merge glass with ceramic sculpture. The focus of the research was to understand the structure of glass, the structure of ceramics, and how they react with each other when heat is introduced. Additional research of this project has required a combining of understanding the historical origins and technical accomplishments of glass, and how it relates to ceramics. Fusing glass and ceramic sculpture without the use of an adhesive has proven successful. Vigorous experimentation has led to the creation of a series of fused glass and ceramic sculptures. By developing a process of merging ceramics and glass I have utilized a largely unexplored technique.

Monday April 23 Presenters

Session 3	10:00-12:00	CSU 202

Anthropology, Communication Disorders, Early Childhood Studies, and Modern Languages

Payoff Transparency and Reward Desirability in the Prisoner's Dilemma
Jeff Holden (Department of Anthropology)
Professor Paul Brown, Faculty Mentor (Department of Anthropology)

Men, Women and Children for Sale: The Dichotomy of Human Trafficking in the United States and Abroad
Elizabeth Kolbe (Department of Anthropology)
Professor Paul Brown, Faculty Mentor (Department of Anthropology)

Five Social Problems Originating from the French & British Fur Trade as Expressed in the Dakota of Minnesota
Jeff Brand (Department of Anthropology)
Professor Ronald Schirmer Faculty Mentor, (Department of Anthropology)

Linguistic Comparison of Emergency Department Physician Communication in Urban and Rural Settings
Kirsten Markiewicz (Department of Communication Disorders)
Professor Patricia Hargrove, Faculty Mentor (Department of Communication Disorders)

Effects of Using Spanish-Speaking Staff to Adapt Home Visits on the Language and Literacy Development of Spanish-Speaking Children
Clarin Collins and Yessica Bonfil (Department of Early Childhood Educational Studies)
Professor Lillian Duran, Faculty Mentor (Department of Early Childhood Educational Studies)

Medieval Norwegian Kings and Their Claims to Power
Daryl R. Lawrence (Department of Modern Languages)
Professor Maria-Claudia Tomany, Faculty Mentor (Department of Modern Languages)

Classical Philology Gone Wild! The use of Classical Texts in the Film All Quiet on the Western Front
Tysen D. Dauer (Department of Modern Languages)
Professor Nadja Krämer, Faculty Mentor (Department of Modern Languages)

Payoff Transparency and Reward Desirability in the Prisoner's Dilemma

Jeff Holden (Department of Anthropology)
Professor Paul Brown, Faculty Mentor (Department of Anthropology)

The Prisoner's Dilemma is an important concept in evolutionary psychology (borrowed from game theory): participants in this game choose whether to cooperate, maximizing group benefit but exposing themselves to risk, or defect, maximizing personal benefit and minimizing risk but also forgoing group benefit. Because of the non-zero-sum nature of the game, it is used as a model for many forms of human interaction. In this study, payoff transparency (i.e. the presence/absence and quality of knowledge regarding the outcome of a given interaction) and reward desirability were manipulated to assess whether either factor had an effect on subjects' rates of cooperation.

Men, Women and Children for Sale: The Dichotomy of Human Trafficking in the United States and Abroad

Elizabeth Kolbe (Department of Anthropology)
Professor Paul Brown, Faculty Mentor (Department of Anthropology)

Living in Thailand in 2005 opened my eyes to the real plight of exploited peoples in the world. I was able to experience first-hand the economic and social issues facing potential victims of human trafficking. There are an estimated 200 million people being held in slavery worldwide. Like most Americans, I believed this is a horrible problem facing only people of developing countries. Last year I heard Chong Kim describe her traumatizing experience of being trafficked within the United States. Over 18,000 people are trafficked into the United States yearly for exploitation. In this paper, I will discuss the issue of human trafficking, explain how trafficking affects different countries, including the United States, and address how a holistic, well-rounded approach is need to stop this global problem on all fronts.

Five Social Problems Originating from the French & British Fur Trade as Expressed in the Dakota of Minnesota

Jeff Brand (Department of Anthropology)
Professor Ronald Schirmer Faculty Mentor, (Department of Anthropology)

Fur trade policies of the French and British from 1660 until 1816 had significant impacts on indigenous cultures such as the Dakota. However, the current literature pertaining to the fur trade offers only a limited amount of information about Dakota interrelations with the French and British. A review of the current literature and interviews with professional researchers in this area yielded five reoccurring themes relating to cultural impacts: materialism, intermarriage, substance abuse, language and environmental degradation. Focusing on these impacts can help provide a better understand the complex issues relating to Native/ European interaction and acculturation processes.

Linguistic Comparison of Emergency Department Physician Communication in Urban and Rural Settings

Kirsten Markiewicz (Department of Communication Disorders)
Professor Patricia Hargrove, Faculty Mentor (Department of Communication Disorders)

Emergency room communication between doctor and patient allows the doctor to gather information for diagnosis and treatment and to transmit information to the patient. In this study, audio tapes of emergency room admissions were transcribed. The transcripts were analyzed using Systematic Analysis of Language Transcripts (SALT) and evaluated for linguistic complexity including length of utterances, morphology and frequency of interruptions. Statistics were compared between urban and rural settings to determine differences in linguistic complexity. Results may have relevance to models of social behavior in urban and rural areas, informed consent issues and development of the physician-patient relationship.

Effects of Using Spanish-Speaking Staff to Adapt Home Visits on the Language and Literacy Development of Spanish-Speaking Children

Clarin Collins (Department of Early Childhood Educational Studies)
Yessica Bonfil (Department of Early Childhood Educational Studies)
Professor Lillian Duran, Faculty Mentor (Department of Early Childhood Educational Studies)

This research study is examining the short term effects of Spanish-language home based early literacy skills in pre-school aged Hispanic children enrolled in Head Start Home Visiting programs in rural south central Minnesota during the 2006-2007 school year. Head Start is a nation wide, government funded program for pre-school aged children from low income families, operating to better prepare and facilitate children's readiness for school. In this study a group of approximately 40 children was given exams to measure oral language and early literacy skills in both English and Spanish. These children received weekly home visits from Spanish-speaking paraprofessionals who conducted early literacy activities in Spanish. The paraprofessionals are employed through Head Start and are supervised in the homes by an English-speaking Head Start home licensed visitor. The purpose of this study was to evaluate the effects of using a Spanish-speaking paraprofessional in pre-school aged children's educational development and school preparedness, and to determine whether or not children's literacy skills are higher with Spanish visitors versus those children that just have English-speaking home licensed visitors. This project is important because the Latino population continues to increase and our schools are becoming more diverse, bringing with them the many challenges of language barriers. We need to continue to find solutions to help Latino students better adapt in the classroom, obtain academic achievement levels similar to those of native English-speaking students, obtain high school graduation rates similar to national rates, and to help Latinos become independent, self reliant, and productive members of our society.

Medieval Norwegian Kings and Their Claims to Power

Daryl R. Lawrence (Department of Modern Languages)
Professor Maria-Claudia Tomany, Faculty Mentor (Department of Modern Languages)

Long before Norway achieved independence from the Swedish crown in 1905 and established a new dynasty of kings, it had a well-established monarchy that developed as far back as the ninth century. How these first kings claimed power is an interesting study in the development of medieval European states. Although the common themes of warfare and paternal descent were encountered, so were very unexpected ways of coming to the throne. In the haphazard days of the Middle Ages when life and limb were uncertain, a powerful kingship developed along the North Sea. Using Snorri Sturluson's *Heimskringla* as the primary focus of this project, the claims to the throne and how kings viewed themselves in the scheme of things became much clearer. The use of this document had quite an impact – the kings could be examined in what has become regarded as the source on the medieval Norwegian monarchy and they could be looked at critically, since *Heimskringla* added a certain political spin to the lives of these rulers. By a careful examination of all factors, a definitive answer as to how these kings claimed power has finally been achieved.

Classical Philology Gone Wild! The use of Classical Texts in the Film All Quiet on the Western Front

Tysen D. Dauer (Department of Modern Languages)
Professor Nadja Krämer, Faculty Mentor (Department of Modern Languages)

Studying the texts of the Greco-Roman era has long been a tradition in the West. Works such as *The Odyssey, The Iliad,* and *The Republic* were understood to be liberating texts which enabled students to think more critically and as a result live more wisely. Many of the leading scholars in this field of "Classical Texts" (also known as Classical Philology) hailed from 19th century Germany. The 1930 German film *All Quiet on the Western Front* presented viewers with a classroom scene set at the start of the First World War where selected classical texts were written on the chalkboard, apparently by the teacher. The camera brings the viewer in from a street scene and focuses on a teacher who is lecturing. The teacher, in an increasingly frenzied state, is persuading his students to join the German war effort. He uses the classical tradition represented by the quotations on the chalkboard as ammunition for irrational and self-destructive thinking. He has taken a tradition valued for critical thought and just actions and turned it into an overemotional, anti-rational Nationalist machine. This project sought to understand the means by which the classical tradition was turned on its head and the implications and warnings which it held for viewers then and now.

Monday April 23 Presenters

Session 4	10:00-12:00	CSU 204

Psychology

Observer's Perceptions of Self-Handicappers' and Sandbaggers' Motives
Jeannie M. Korngable (Department of Psychology)
Professor Daniel Sachau, Faculty Mentor (Department of Psychology)

Trust Formation Across Multiple Levels of Virtuality
Amanda Woller (Department of Psychology)
Professor Andrea Lassiter, Faculty Mentor (Department of Psychology)

Developing and Evaluating the Effectiveness of a Training Program for Secondary-Level, Targeted Behavioral Interventions in School
Michael Parry (Department of Psychology)
Professor Kevin Filter, Faculty Mentor (Department of Psychology)

The Cultural Construction of Emotional Experience and Subjective Well-Being: The Role of Social Situations in Japan and the United States
Khou Yang (Department of Psychology)
Professor Vinai Norasakkunkit, Faculty Mentor (Department of Psychology)

The Effects of Divorce and Its Associated Stressors on Children and Adolescence
Aaron Brownlee (Department of Psychology)
Professor Sarah Sifers, Faculty Mentor (Department of Psychology)

School Psychology Practice and Job Satisfaction
Rebecca E. Fenicle (Department of Psychology)
Professor Kevin J. Filter, Faculty Mentor (Department of Psychology)

The Impact of Weather Conditions on Mood Variability in Geographically Relocated Versus Non-Relocated Individuals
Jamie M. Scott (Department of Psychology)
Professor Jeffrey A. Buchanan, Faculty Mentor (Department of Psychology)

Work and Leisure Attitudes - "Sunday Night Blues"
Vesna Champagne (Department of Psychology)
Professor Lisa M. Perez, Faculty Mentor (Department of Psychology)

Observer's Perceptions of Self-Handicappers' and Sandbaggers' Motives

Jeannie M. Korngable (Department of Psychology)
Professor Daniel Sachau, Faculty Mentor (Department of Psychology)

The purpose of the study is to examine how observers perceive the motives of people who sandbag and self-handicap. Sandbagging is a self-presentation strategy involving a false claim of inability. Self-handicapping is a self-presentation strategy involving a true claim of inability. People use sandbagging and self-handicapping so that observers will have low expectations for the sandbagger's or self-handicapper's performance. In this study, I asked which of these strategies leads to a more favorable impression? I created sixteen short scenarios where an actor or target in the scenario makes a claim prior to performing in competition. One half of the targets claim an injury, and one half of the targets do not claim an injury. Across these conditions, one-half of the targets are described as actually having the injury (self-handicap), one-half are described as not having the injury (sandbagging). Scenarios were divided once again such that one half of the targets proceed to fail and one half succeed in this 2 (claim/not claim) x 2 (not have/have) x 2 (failure/success) factorial deign. Students enrolled in introductory psychology courses participated in this study. Participants were randomly assigned two scenarios to be read. Participants rated the target in each scenario on: likeability, trustworthiness, competence and friendliness. The students also completed the Janis-Field Self-Esteem Scale, the Self-Handicapping Scale, and the Sandbagging Scale. I predicted that there would be a penalty for claiming any injury. I predicted that sandbaggers would be rated more negatively than self-handicappers particularly in success conditions.

Trust Formation Across Multiple Levels of Virtuality

Amanda Woller (Department of Psychology)
Professor Andrea Lassiter, Faculty Mentor (Department of Psychology)

When team members are separated by offices, cities, or continents, they are considered "virtual." Virtual group or teamwork is becoming more common in today's world. Since trust is essential for effective team performance, it is also required for virtual teams. This study looked at the formation of trust in relation to different levels of group virtuality. Participants were undergraduate students from Minnesota State University's psychology classes and worked in pairs on the game, Command and Conquer: Generals. Teams either worked together face-to-face; met first and then were separated to work together; or were completely separated having to work together without seeing one another. Face-to-face groups were expected to have higher levels of trust than virtual groups, while the group that was allowed to meet first was expected to have higher levels of trust than the completely virtual group. In turn, higher performance scores were expected for groups who had higher levels of trust.

Developing and Evaluating the Effectiveness of a Training Program for Secondary-Level, Targeted Behavioral Interventions in School

Michael Parry (Department of Psychology)
Professor Kevin Filter, Faculty Mentor (Department of Psychology)

An increasing body of research is addressing the validity and effectiveness of secondary-level interventions in school settings. However, there has been limited research directed towards the formal training of school professionals in the implementation of these interventions. Within this research project, a training program was developed on the implementation of secondary-level interventions, more specifically the Check-in/ Check-out program. The effectiveness of the training course was assessed using two measures; a) evaluation of trainee satisfaction, b) evaluation of the degree to which the trainee expanded upon their existing knowledge base in regards to the training content. The potential participant pool consisted of 21 schools that were currently implementing School-wide Positive Behavior Support systems. A needs assessment was given to these schools to identify the most apt participants for the current scope of research. The hypothesis of this project was that the training would lead to an increase in knowledge about secondary-level interventions and satisfaction with the training itself.

The Cultural Construction of Emotional Experience and Subjective Well-Being: The Role of Social Situations in Japan and the United States

Khou Yang (Department of Psychology)
Professor Vinai Norasakkunkit, Faculty Mentor (Department of Psychology)

Previous studies indicated that North Americans tend to dominantly experience emotions that are more relevant to non-relational aspects of the self (*socially disengaged emotions*) while Japanese tend to dominantly experience emotions that are more relevant to relational aspects of the self (*socially engaged emotions*) and that those categories of emotions divergently relate to subjective well-being for North Americans and Japanese. The role that qualitatively different social situations play in affording culturally divergent emotional experiences and in influencing what constitutes subjective well-being was examined. Japanese and English versions of a questionnaire containing common Japanese and American situations were administered to college students at Minnesota State University, Mankato and Japan. Participants were asked to carefully read each situation and then visualize themselves in those situations. They were then asked how each of these situations will impact their emotional experience and their emotional responses were reported by choosing two emotions from a list of emotions – one specific emotion listed in two categories (socially engaged, socially disengaged) and one general emotion listed in two categories (general positive, general negative). In addition, the level of emotional intensity experienced by the participants for each situation were rated using a Likert scale. It is hypothesized that, regardless of the origin of the participants, Japanese situations will more strongly elicit socially engaged emotions while American situations will more strongly elicit socially disengaged emotions. Additionally, socially disengaged situations will be more strongly tied to American subjective well-being while the socially engaged situations will be more strongly tied to Japanese subjective well-being.

The Effects of Divorce and Its Associated Stressors on Children and Adolescence

Aaron Brownlee (Department of Psychology)
Professor Sarah Sifers, Faculty Mentor (Department of Psychology)

This study investigates how divorce affects the children who undergo the experience. There were four factors looked at to determine whether children of divorce emerge unscathed by their parents' marital dissolution. Those protective factors were family environment, social support, appraisal of the divorce, and the number of the other events that have been shown to often co-occur with divorce. By utilizing the Family Environment Scale (FES), Life Events Checklist (LEC), Social Support Scale for Children (SSSC), and the Behavioral Assessment Scale for Children, second edition (BASC-2; parent and self-reports) we assed how family environment, social support, appraisal and co-occurring divorce stressors played a role in protecting children. Our sample consisted of 91 children and their parents from the Mankato area public school. A linear regression analysis was used to determine which factors acted as significant protective factors. We determined there was a main effect for the appraisal of co-occurring stressors. This result suggested that the greater amount of stress experience by children and adolescence regarding parental divorce predicted a greater inability to function normally. This result suggests that a greater amount of familial stress experience by children and adolescence regardless of parental marital status predicted a greater inability to function normally. Results did not support the hypothesis that family environment, social support, and appraisal of stressors are protective factors or that divorce-related stressors are risk factors for children experiencing parental divorce since there was no indication that children who experienced divorce were any worse off then those who did not experience divorce.

School Psychology Practice and Job Satisfaction

Rebecca E. Fenicle (Psychology)
Professor Kevin J. Filter, Faculty Mentor (Department of Psychology)

School Psychology as a profession has been shown in numerous studies to be characteristic of high job satisfaction. There are many factors that influence job satisfaction. This study was concerned with the roles of school psychologists and whether a discrepancy in actual and desired roles may effect job satisfaction. "Survey of the Professional Practices of Minnesota School Psychologists" was distributed to practicing school psychologists in Minnesota through an email with a URL link. The on-line survey contained questions concerning demographics, practices (actual/desired), adequacy of training program, barriers, and job satisfaction. This study analyzed the relationships between practices and job satisfaction.

The Impact of Weather Conditions on Mood Variability in Geographically Relocated Versus Non-Relocated Individuals

Jamie M. Scott (Department of Psychology)
Professor Jeffrey A. Buchanan, Faculty Mentor (Department of Psychology)

Weather has long been regarded to influence the mundane mood of the population. A pervasive belief exists that individual's moods are heightened by warm and sunny days, whereas moods are lowered by cold and cloudy days. Previous research has provided mixed and limited results. However, a void exists in the literature in regards to how identical weather conditions impact individuals from different geographic locations. It is believed that nonindigenous individuals are more susceptible to fluctuations in mood stemming from novel weather conditions than would be indigenous individuals. Sample recruitment consisted of students attending Minnesota State University. The sample consisted of 70 life-long Minnesota residents and 25 individuals who have spent at minimum one year living outside of Minnesota. Participants completed a mood self-report measure, the Positive and Negative Affect Scale, online for four consecutive weeks to determine affect levels. This data was then matched with corresponding weather data for the same time period in order to ascertain mood variability differences in response to distinct weather patterns. Between-subjects ANOVAS were utilized to determine variance in mood variability between geographic groups as measured by positive and negative affect. Variance between geographic group's affective responses to independent weather measures was additionally examined.

Work and Leisure Attitudes - "Sunday Night Blues"

Vesna Champagne (Department of Psychology)
Professor Lisa M. Perez, Faculty Mentor (Department of Psychology)

The term "Sunday Night Blues (SNB)" refers to the negative feelings one experiences toward the end of the weekend upon thinking about returning to work in the morning. Previous research on mood variation has focused on Mondays as being the low point of mood for the week. Unfortunately, the Monday hypothesis was only supported when data was collected retrospectively. Researchers collecting daily reports of mood throughout the week did not find the expected Monday effect. Rye (2005) used retrospective reporting, to show that about 35% of participants reported experienced SNB. Furthermore, Rye (2005) identified that the SNB phenomenon was related to feeling a loss of control in anticipation of the workweek. The goal of this study was to obtain a real time measurement of SNB on Sunday evenings and compare those to real time measurements obtained on Wednesday evenings. We predicted that participants would report a more negative mood and a greater reluctance to return to work the next day on Sunday night, compared to Wednesday night. In addition, we predicted that experiencing a lack of control and job stressors would correlate significantly with SNB and reluctance to return to work on Sunday night. Participants were asked to complete two online surveys, Sunday evening and Wednesday evening. This research has implications for organizations interested in employees' quality of life.

Monday April 23 Presenters

Session 5 **10:00-12:00** **CSU 255A/B**

Chemistry & Geology and Physics & Astronomy

Readability Levels of College Chemistry Textbooks from Introductory Chemistry to Physical Chemistry
Elizabeth A. Drommerhausen (Department of Chemistry & Geology)
Professor Jeffrey R. Pribyl, Faculty Mentor (Department of Chemistry & Geology)

Effect of Molecular Size on the Sorption of Hydrophobic Compounds with Dissolved Organic Matter
John Freiderich (Department of Chemistry & Geology)
Professor John Thoemke, Faculty Mentor (Department of Chemistry & Geology)

Synthesis of 5-[5-(5-Formyl-2-thienyl)-2-furyl]-2-thiophenecarbaldehyde
Joseph P. Bequette (Department of Chemistry & Geology)
Professor Brian L. Groh, Faculty Mentor (Department of Chemistry & Geology)

Analysis of OLED performance
Chris Markle (Department of Physics & Astronomy)
Professor Hai-Sheng Wu, Faculty Mentor (Department of Physics & Astronomy)

Fluid Properties in the Formation of High-Grade Iron Ore in Northern Minnesota
Elizabeth A. Drommerhausen (Department of Chemistry & Geology)
Professor Steven Losh, Faculty Mentor (Department of Chemistry & Geology)

Investigation of Thermodynamic and Magnetic Properties of Strongly Correlated and Hybridized Electron Systems
Eric Raymer (Department of Physics & Astronomy)
Professor Igor Kogoutiouk, Faculty Mentor (Department of Physics & Astronomy)

Population, Oil Consumption, and Carrying Capacity
Robert E. Freiderich (Department of Physics & Astronomy)
Professor Louis Schwartzkopf, Faculty Mentor (Department of Physics & Astronomy)

Measuring Noble Gases in Coma Samples from Comet Wild 2
Jacob Simones (Department of Physics and Astronomy)
Professor Russell Palma, Faculty Mentor (Department of Physics and Astronomy)

Readability Levels of College Chemistry Textbooks from Introductory Chemistry to Physical Chemistry

Elizabeth A. Drommerhausen (Department of Chemistry & Geology)
Professor Jeffrey R. Pribyl, Faculty Mentor (Department of Chemistry & Geology)

The perception of many students is that their chemistry textbooks are difficult to read. Textbooks often present too many concepts at once and contain numerous vocabulary words in a unit. The reading level, also known as the readability level, is an important factor to be considered during textbook selection. My work demonstrates that chemistry textbooks typically are written at a reading level above college students' abilities. Numerous college chemistry textbooks used throughout an undergraduate chemistry program (from Introductory Chemistry to Physical Chemistry) were analyzed for their readability level using several standard readability formulas and graphs. Results of this work show that organic and biochemistry textbooks are the most difficult to read due to the extensive use of chemical nomenclature. Readability levels of textbooks in the various chemical disciplines will be discussed.

Effect of Molecular Size on the Sorption of Hydrophobic Compounds with Dissolved Organic Matter

John Freiderich (Department of Chemistry and Geology)
Professor John Thoemke, Faculty Mentor (Department of Chemistry and Geology)

Synthetic hydrophobic organic compounds are a source of pollution in natural waters and can have effects on biological organisms. Dissolved organic matter (DOM) is found within aqueous systems, and hydrophobic organic compounds undergo a sorption process to DOM. Understanding this sorption process is important in determining the environmental transport of these hydrophobic compounds and their bioavailability. A series of probe molecules that absorb visible light were used in an attempt to identify the different properties of hydrophobic species that promote sorption to DOM. An HPLC equipped with a size-exclusion chromatography column was used as a means to partition the prepared aqueous solutions. UV-Vis spectroscopy was used to detect the quantities of probe molecules that eluted from the column.

Synthesis of 5-[5-(5-Formyl-2-thienyl)-2-furyl]-2-thiophenecarbaldehyde

Joseph P. Bequette (Department of Chemistry and Geology)
Professor Brian L. Groh, Faculty Mentor (Department of Chemistry and Geology)

5-[5-(5-Formyl-2-thienyl)-2-furyl]-2-thiophenecarbaldehyde (NSC 629035) has been found to possess anti-tumor properties in the NCI Anticancer Drug Screen. A similar compound, 2,5-bis(5-hydroxymethyl-2-thienyl)furan (NSC 652287), has also been found to possess anti-tumor properties. A correlation between the ability to metabolize NSC 652287, hypothesized as NSC 629035, and its cytotoxicity has been demonstrated. The mechanism by which these compounds act is not fully understood. Approximately 3 g of commercially available NSC 629035 ($3,850/250 mg) is required for mechanistic studies. The prohibitive cost demanded the development of a viable synthetic approach to this compound. Two routes for the synthesis of NSC 629035 will be presented.

Analysis of OLED performance

Chris Markle (Department of Physics and Astronomy)
Professor Hai-Sheng Wu, Faculty Mentor (Department of Physics and Astronomy)

A Cesium Fluoride doped Organic Light-Emitting Device (OLED) with the structure of ITO/F4-TCNQ:NPB/S-DPVBi/BCP/Alq3/Alq3:CsF/CsF/Al has been fabricated and characterized. This OLED structure has been analyzed and it performance has been compared to a similar non-doped OLED, with the purpose of ascertaining potential benefits. We found that with the small amount of doping (~ wt 0.5%) of CsF into the Alq3 electron transport/emission layer, the electron mobility of the OLED has significantly increased, and thus its optoelectronic properties, such as the I vs. V curve, luminance vs. voltage curve, have shown dramatic increases as well – more than an order of magnitude increase. The spectrum of the CsF doped OLED has shown a single blue peak at around 473 μm, very different from the non-CsF doped OLED, which has shown two convoluted peaks at 450 μm (deep blue from BPVBi) and at 550 μm (green from Alq3).

Fluid Properties in the Formation of High-Grade Iron Ore in Northern Minnesota

Elizabeth A. Drommerhausen (Department of Chemistry and Geology)
Professor Steven Losh, Faculty Mentor (Department of Chemistry and Geology)

The Mesabi Iron Range in Northern Minnesota has been a major producer of iron ore for over 100 years. Most of the known high-grade ore lies near the surface and has been already been mined. Determining whether more high-grade ore may lie at depth could have significant economic impact on the mining industry in northern Minnesota. To evaluate the likelihood of finding more high-grade iron ore deeper underground, it is important to determine the source of the fluids that are responsible for that ore. I have been examining Morey's hypothesis in which he proposed that a plate collision event 1.8 billion years ago drove deep fluids upward along faults within the iron formation. In this case, high-grade ore could exist deeper within the iron formation, which is tilted gently beneath the surface. Samples collected in the iron range have been analyzed using various geologic methods. Growth banding, using cathodoluminescence, and the salinity of the fluid from fluid inclusions were used to evaluate the source of the fluid.

Investigation of Thermodynamic and Magnetic Properties of Strongly Correlated and Hybridized Electron Systems

Eric Raymer (Department of Physics & Astronomy)
Professor Igor Kogoutiouk, Faculty Mentor (Department of Physics & Astronomy)

We performed a theoretical study of the thermodynamic and magnetic properties of strongly correlated and hybridized electron systems. We used a modified version of the two-band Periodic Anderson Hamiltonian to model behavior of electrons in such systems. Using the improved truncation approximation for irreducible Green functions, we observed the appearance of four spectral density moments and four or five sub-bands in the non-magnetic density of states. Applying a magnetic field resulted in the density of states splitting into additional sub-bands. We also analyzed the influence of the spin-spin and electron hole excitations on the magnetic susceptibility, density of states, and specific heat in the intermediate valence and heavy-fermion regimes.

Population, Oil Consumption, and Carrying Capacity

Robert E. Freiderich (Department of Physics & Astronomy)
Professor Louis Schwartzkopf, Faculty Mentor (Department of Physics & Astronomy)

In this work, I studied the relation between the population and oil consumption from the years 1980 to 2004. While one would expect oil consumption to increase with population growth, I examined a stronger hypothesis. I hypothesized that oil consumption is proportional to population. To understand the true nature of this proportionality, a number of representative countries were chosen and examined from around the world. As a general trend, the total world population has been on the rise with a corresponding rise in oil consumption. Of particular interest is the country of North Korea for which, following the decline of the Soviet Union, there was a rapid decrease in oil consumption. If oil consumption is proportional to population, and the oil consumption falls, so will the population. In fact, there was a famine in North Korea during the mid 1990's in which 2.5 million people died. My work has determined that oil consumption and population are proportional for most of the representative countries.

Measuring Noble Gases in Coma Samples from Comet Wild 2

Jacob Simones (Department of Physics and Astronomy)
Professor Russell Palma, Faculty Mentor (Department of Physics and Astronomy)

Since comets are relics of the early solar system, the formation of the solar system can be better understood through compositional analysis of cometary material. In 2004, NASA's Stardust spacecraft used a low density, silicon-based substance called aerogel to collect coma samples from comet Wild 2, which were returned to earth for analysis in 2006. Aerogel not from the spacecraft with no embedded cometary material was investigated to determine the possibility of measuring noble gases in Stardust samples. Gas evolved from heated, non-flight aerogel was measured initially using a residual gas analyzer, then a high-sensitivity mass spectrometer. The levels of helium and neon isotopes observed from both instruments were sufficiently low that noble gases from Stardust samples were measured using the same technique. Helium and neon above background was measured in flight samples containing tracks from comet particle impacts. There was no excess helium or neon measured in aerogel that had no apparent cometary material.

Monday April 23 Presenters

Session 6 **1:00-2:30** **CSU 201**

English, Law Enforcement, Political Science, Philosophy, and Speech Communication

The Decision to Run: The Stories of Women in the Minnesota Legislature
Danielle M. Thomsen (Department of Political Science)
Professor Joseph Kunkel, Faculty Mentor (Department of Political Science)

Religion and the Oppression of Animals
Bailey Breck Rolfsrud (Department of Philosophy)
Professor Craig Matarrese, Faculty Mentor (Department of Philosophy)

Creating a Responsible Media
Alyssa George (Department of Law Enforcement)
Professor Colleen Clarke, Faculty Mentor (Law Enforcement)

An Ethical Debate: Measuring Truthiness in Parliamentary Debate
Joshua Randall and David Brennan (Department of Speech Communication)
Professor James Dimock, Faculty Mentor (Department of Speech Communication)

Critique of the Appropriation of Black Culture by White Suburban Youth
Julie L. Lemley (Department of Speech Communications)
Professor James Dimock, Faculty Member (Department of Speech Communications)

This Modern Life
Amanda Bingham (Department of English)
Dodie Miller, Graduate Student Mentor (Department of English)
Professor Richard Robbins, Faculty Mentor (Department of English)

This Modern Life
Kelly Biers (Department of English)
Dodie Miller, Graduate Student Mentor (Department of English)
Professor Richard Robbins, Faculty Mentor (Department of English)

This Modern Life
Nathan Klein (Department of English)
Dodie Miller, Graduate Student Mentor (Department of English)
Professor Richard Robbins, Faculty Member (Department of English)

The Decision to Run: The Stories of Women in the Minnesota Legislature

Danielle M. Thomsen (Department of Political Science)
Professor Joseph Kunkel, Faculty Mentor (Department of Political Science)

The underrepresented status of women in legislative positions is an entrenched flaw in the American political system. Although past research has investigated the obvious gender gap, the spotlight has recently shifted toward the preliminary factors affecting a candidate's political ambition. It has been noted that women have little aspiration to run for office, and are unlikely to even consider themselves as viable candidates. Encouragement offered by political parties and external supporters such as family, friends, coworkers, and community organizations plays a vital role in creating a female candidate. This paper evaluates the impact of outside forces on the female candidate image and how those factors influence women's final decision to run for office. I interview female legislators in St. Paul, Minnesota, and uncover the motivations for and obstacles to their candidacies. I analyze the themes that emerge from their narratives and share their collective stories as women legislators. With the 2006 elections, Minnesota now boasts the third highest proportion of female legislators in the nation, comprising 34.8% of the legislature. The personal experiences of these women may serve as a recipe to future gender parity in state legislatures and Congress.

Religion and the Oppression of Animals

Bailey Breck Rolfsrud (Department of Philosophy)
Professor Craig Matarrese, Faculty Mentor (Department of Philosophy)

The thesis for this paper is that the literal view of the Bible, i.e. the view that the Bible should be read directly as it states, rather than thinking about it in a more abstract sense, is wrong. The reason for this view is due to the current oppression (and by oppression it is meant that there is a cruel exercise of power being used by a human against another, either human or animal) of animals. The reason that most people state for the current oppression of animals is the Biblical verse, "Man has dominion over animals" which people take to mean that man has the right to do whatever it pleases to animals. This is a historical issue, due to the fact that there is a history of oppression through Biblical verses. I will show this by giving past oppressive Biblical verses, such as those that held African Americans in slavery for decades, the verse that made Hitler and his followers believe that it was acceptable to murder millions of Jewish people, the verse that held back women in society for thousands of years, and the current verse that makes people believe it is right to oppress the homosexual community. The reason that this is historical is that every single time a Biblical verse is taken literally, a large group suffers tremendously, and for no empirical reason. Thus, the thesis is that the Biblical view that man has the right to "dominion" in the literal sense over animals is wrong, and I intend to prove this through a historical perspective.

Creating a Responsible Media

Alyssa George (Department of Law Enforcement)
Professor Colleen Clarke, Faculty Mentor (Law Enforcement)

Since the attacks on September 11, acts of terrorism have been increasingly prevalent in the main stream media. Media interest in this subject has had a considerable effect on United States national security and the psyche of its citizens. Terrorism makes a perfect news story; filled with enough drama to keep the public captive focusing on terror and tragedy. This may tempt the media to lose its objective stance of keeping people informed in favor of ratings. This presentation will highlight the serious danger to national security when broadcasting groups compete for the best story regardless of the effect it may have on the nation's safety, as well as the psychological well being of society. This presentation will explore the relationship of the media's representation of terrorism and the connection between media and the government and law enforcement agencies.

An Ethical Debate: Measuring Truthiness in Parliamentary Debate

Joshua Randall (Department of Speech Communication)
David Brennan (Department of Speech Communication)
Professor James Dimock, Faculty Mentor (Department of Speech Communication)

The practice of competitive debate has, since Ancient Greece, been justified as a way of developing critical thinking, public speaking and civic understanding and the National Parliamentary Debate Association (NPDA) embraces that vision of debate. Founded in 1992, the NPDA strives to promote civic engagement, leadership and the development of argumentation and public speaking skills through competition in organized, intercollegiate debates. Central to the NPDA's mission is the belief speakers should be able to debate extemporaneously, without reliance on evidence and files, about a wide variety of subjects and thus in addition to other benefits of debate, it encourages student competitors to be informed and knowledgeable on a wide variety of topics.

As Rutledge (2002) has observed, however, the educational foundation of parliamentary debate is threatened by lying. If student competitors do not know about current events but actually only claims to know, then parliamentary debate not only has no educational value but also actually teaches people how to lie, trick and deceive, practices, which do not support democracy but actually threaten it.
Our research answered Rutledge's call to see if lying is rampant in the NPDA. This would test the viability of NPDA debate as an educational tool.

Critique of the Appropriation of Black Culture by White Suburban Youth

Julie L. Lemley (Department of Speech Communications)
Professor James Dimock, Faculty Member (Department of Speech Communications)

This critique is an examination of the appropriation of black culture by white suburban youth as being not only racist, but sexist. This phenomenon is viewed through the lens of hip hop culture as conceptualized by predominately white, male dominated corporations promoting the commercialization to affect an increase in profit by specifically targeting the music to white suburban youth. As hip hop has developed from the origins of rap, the critical content contained within the lyrics has undergone transformation by replacing messages that speak out against race oppression on a systemic level to a focus that objectifies women, encourages violence and glamorizes the consumption of drugs and alcohol through hypermasculinity as a role. In addition, there exists an intentional promotion of luxury consumerism that is far removed from the predominant realities within urban black experience.

This phenomenon is definitively racist and simultaneously sexist as it promotes representations of black culture that reflect the most extreme negative aspects existing within the urban black experience such as drugs, violence and gang behavior by perpetuating white supremacist assumptions about black culture and masculinity. The effects of this phenomenon extend to the domination of women by men in a manner that further marginalizes women by indulging the male fantasy in which females become willing participants in their own objectification. The denigration that women experience from men in this view is more sexist, more violent and more harmful, as approval of women by men increases proportionately to the level of submission by women to men.

This Modern Life

Nathan Klein (Department of English)
Dodie Miller, Graduate Student Mentor (Department of English)
Professor Richard Robbins, Faculty Member (Department of English)

For our project, group members explored the theme This Modern Life in its varied interpretations through fiction, nonfiction, and poetry. For my project, the theme This Modern Life was addressed through poetry. The piece I wrote was influenced by my own personal reflections in relation to what this current life has imprinted into me. As a theme, This Modern Life implies little, it left me open to consider contrasting and comparing with other ages, or simply to describe things as they currently are. Since I do not have first hand experience of what I would consider a past "age," I choose to write on how things are now. I took it on an individual level as I felt that the "This" in the title was accurately pointing to something specific, and since I know me best I wrote about my personal perspectives because I thought I would stay consistent with the notion of writing about what is most familiar to me is best. My goal was to inscribe perspectives onto the reader that they may not have come to yet, and show the value of the given view. I accomplished this by searching deep within myself to come up with what I felt was of a highly original quality, and still cohesive and with a strong relativity to everyone's life. The workshops with peers were something added to the result I came up with.

This Modern Life

Kelly Biers (Department of English)
Dodie Miller, Graduate Student Mentor (Department of English)
Professor Richard Robbins, Faculty Mentor (Department of English)

For our group project, members explored different interpretations of the theme, This Modern Life, through various forms of creative writing. I chose to express the theme through fiction. I focused on the ways in which fear is perpetuated and the ways in which fear has affected our society. These fears of modern life were examined through a variety of perspectives. Our group attained our goals through observation, discussion, research, and workshop.

This Modern Life

Amanda Bingham (Department of English)
Dodie Miller, Graduate Student Mentor (Department of English)
Professor Richard Robbins, Faculty Mentor (Department of English)

The theme This Modern Life will be shown in our group through poetry, non-fiction, and fiction. We will be showing this based on where we live physically and through the state of mind. Through my fiction piece I hope people will learn about This Modern Life through my perception of the theme both in a physical aspect and state of mind on how the modern world is.

Monday April 23 Presenters

Session 7 **1:00-3:00** **CSU 203**

Women's Studies and Mass Communications

The Ups and Downs of Women, In Hollywood Films and American Life
Marcia Hewitt (Department of Mass Communications)
Professor John Gaterud, Faculty Mentor (Department of Mass Communications)

Title IX at Minnesota State University, Mankato
Courtnay VanDeVelde (Department of Women's Studies)
Professor Jocelyn Fenton Stitt, Faculty Mentor (Department of Women's Studies)

To Vote or Not to Vote: Influences on Young MSU Women Concerning the Decision to Vote
Gillian Gray (Department of Women's Studies)
Professor Jocelyn Fenton Stitt, Faculty Mentor (Department of Women's Studies)

Defining Sexual Assault, A Survey of College-Age Men
Lisa Pohl (Department of Women's Studies)
Professor Jocelyn Fenton Stitt, Faculty Mentor (Department of Women's Studies)

Wonderful: The Power of a Compliment on a Woman's Self-Esteem
Jennifer Melby (Department of Women's Studies)
Professor Jocelyn Fenton Stitt, Faculty Mentor (Department of Women's Studies)

Essentialism, Experience, and the Transsexual Reality
Brad Freihoefer (Department of Women's Studies)
Professor Jocelyn Fenton Stitt, Faculty Mentor (Department of Women's Studies)

The Ups and Downs of Women, In Hollywood Films and American Life

Marcia Hewitt (Department of Mass Communications)
Professor John Gaterud, Faculty Mentor (Department of Mass Communications)

Since the birth of the Hollywood dream machine, movies have both reflected society and influenced it. One example of this is the way Hollywood films have paralleled the progressions and backlashes of the American women's movement since the beginning of the twentieth century. This project examines these historical connections as well as 15 contemporary films and their relationship to the modern American woman's experience. In the analyses of these films, several types of women characters were identified and related to the backlash American women have experienced over the last 20 years.

Title IX at Minnesota State University, Mankato

Courtnay VanDeVelde (Department of Women's Studies)
Professor Jocelyn Fenton Stitt, Faculty Mentor (Department of Women's Studies)

Society sets certain standards for women. Only a few decades ago, playing sports was not considered appropriate feminine behavior. This research focused on the experiences of being a female athlete at the establishment of the Women's Intercollegiate Athletic Program at Minnesota State Mankato (1964) as well as current female athletes at Minnesota State Mankato (2006-07). Through a compilation of oral histories of women athletes and coaches prior to the Title IX implication, an assessment was made about the experiences of women athletes and coaches at a time when mostly men dominated the arena of sports. The focus of this research was to reveal the point of view of women who are now maturing and growing up compared with those who laid the foundation. Through the interviews, the women's description of their experience explains whether or not a similar experience is being endured between the two groups of women.

To Vote or Not to Vote: Influences on Young MSU Women Concerning the Decision to Vote

Gillian Gray (Department of Women's Studies)
Professor Jocelyn Fenton Stitt, Faculty Mentor (Department of Women's Studies)

Women leaders in the early 1900's fought to give women the right to vote. I researched how young women are using that right. According to the voting report of the United States Census Bureau, in the 2004 presidential election more people between the ages of 18-25 voted than in previous elections. Yet the percent of young women vs. young men voting decreased. I hypothesize that family, education, and society are influencing young women about their decision to vote as well as whom they are voting for. Using surveys of 400 Minnesota State Mankato females and random interviews I hope to determine if young women are uneducated about politics and to understand their process of voting or not voting.

Defining Sexual Assault, A Survey of College-Age Men

Lisa Pohl (Department of Women's Studies)
Professor Jocelyn Fenton Stitt, Faculty Mentor (Department of Women's Studies)

Sexual assault is a prevalent and serious problem in today's society. However frequently it occurs, not everyone is in agreement on what exactly constitutes assault. It is quite possible that men and women have very different views on the subject, which in turn, could be a contributing factor of sexual assault. This paper took a closer look at how college-age men (18-22 years old) define sexual assault. Fifty questionnaire surveys were randomly administered on the Minnesota State Mankato campus, posing questions on sexual practices, thoughts and opinions on sexual assault, and handling other's sexual behavior. Past research was also considered. By conducting this research perhaps society can accumulate a more specific definition, therefore working towards ending all sexual assaults.

Wonderful: The Power of a Compliment on a Woman's Self-Esteem

Jennifer Melby (Department of Women's Studies)
Professor Jocelyn Fenton Stitt, Faculty Mentor (Department of Women's Studies)

Negative words can stay with women for the rest of their lives, but can a compliment help to shape a woman's self-esteem? Starting out with a short introductory questionnaire and then using a qualitative approach to feminist research, I interviewed women between the ages of 20 and 70 years old. The process started by discussing the subjects' basic demographics, family structures, relationships, friendships, work and school relationships. I focused on a small sampling of women so as to spotlight the experiences these women have had with compliments and positive words. Among the many questions in the semi-structured interview we discussed how the intention behind compliments *and* who gives a compliment can change the power behind the word(s). While taking the information from these interviews along with the information gathered from researching feminist song lyrics, feminist journals and spiritual wisdom books, I discuss how compliments can change a woman's life by positively impacting not only her relationships at home, work or school, but also her relationship with herself and her self-esteem.

Essentialism, Experience, and the Transsexual Reality

Brad Freihoefer (Department of Women's Studies)
Professor Jocelyn Fenton Stitt, Faculty Mentor (Department of Women's Studies)

Within modern feminist debate, the definition of "woman" has created two different core theories. The essentialist perspective defines a "woman" as needing a certain list of criteria that are required in order to be considered a woman. The experience perspective defines a "woman" by criteria based on experience of the feminine gender expression and society's response. Male to female transsexuals embody real world scenarios in which the definitions of womanhood are put into practice and challenged. I did in-depth interviews with two male to female transsexuals about their experiences within the workplace. Additional interviews were conducted with their clients during or after their transition in order to gain a better understanding of current perceptions surrounding women's identity and community in relation to a male to female transsexual throughout transition. Through analyzing these two in-depth interviews, I hope to illuminate alternative definitions of womanhood. Data will be obtained using two methods. The first will be in-depth interviews that will gain personal responses to questions I pose. The second will be through content analysis of articles, books, and discussions surrounding womanhood and what it means to be a woman.

Monday April 23 Presenters

Session 8	3:00-5:00	CSU 284

Engineering, Math & Statistics, and Computer Information Science

E20 Effects on Automotive Fuel Pumps
Thomas Devens, Nathan Hanson, Adam Larson, and Colin Rohde (Department of Automotive Engineering Technology)
Professor Gary R. Mead, Faculty Mentor (Department of Automotive Engineering Technology)

Plug-In Hybrid Vehicle Analysis
Christopher Bahn, Eric Esselman, Nate Starkson, and Jacob Wilson (Department of Automotive Engineering Technology)
Professor Bruce Jones, Faculty Mentor (Department of Automotive Engineering Technology)

ATV Fuels and Emissions Research
Fredrick Anderson, Kurt Gostomczik, and Martin Mogensen (Department of Automotive Engineering Technology)
Professor Gary Mead, Faculty Mentor (Department of Automotive Engineering Technology)

Mathematical Modeling and Simulation of Multialleic Migration-Selection Models
Chad N. Vidden (Department of Mathematics)
Professor Namyong Lee, Faculty Mentor (Department of Mathematics)

Music Compiler: An Exercise in the Use of Coroutines
Samuel Crow (Department of Computer & Information Sciences)
Professor Leon Tietz, Faculty Mentor (Department of Computer & Information Sciences)

Automated Visual Inspection for Discriminating Between Heraldic Devices and Text
Ivan A. Marte (Department of Computer & Information Sciences)
Professor Rebecca Bates, Faculty Mentor, (Department of Computer & Information Sciences)

Developing Microsoft Word 2007 Add-On Applications
Peter L. Sonnek (Department of Computer & Information Sciences)
Professor Ann Quade, Faculty Mentor (Department of Computer & Information Sciences)

Development of a High Gain Double Spherical Helical Antenna for Wireless Communication
Rumman Kabir and Monish Tuladhar (Department of Electrical Engineering)
Professor Ramakrishna Nair, Faculty Mentor (Department of Electrical Engineering)

E20 Effects on Automotive Fuel Pumps

Nathan Hanson (Department of Automotive Engineering Technology)
Thomas Devens (Department of Automotive Engineering Technology)
Adam Larson (Department of Automotive Engineering Technology)
Colin Rohde (Department of Automotive Engineering Technology)
Professor Gary R. Mead, Faculty Mentor (Department of Automotive Engineering Technology)

The State of Minnesota has mandated that 20% of all gasoline is to be made up of ethanol. Before this mandate can be implemented, extensive research must be conducted to ensure compatibility of the fuel systems operating on E20 in all automobiles along with small engine and marine applications. The goal of this study was to compare the effects of E20 versus that of E10 and ASTM Test Fuel C. The E20 fuel pump project focused primarily on automotive fuel pumps, and how E20 affected the performance of the pump in terms of corrosion and endurance.

Plug-In Hybrid Vehicle Analysis

Christopher Bahn (Department of Automotive Engineering Technology)
Eric Esselman (Department of Automotive Engineering Technology)
Nate Starkson (Department of Automotive Engineering Technology)
Jacob Wilson (Department of Automotive Engineering Technology)
Professor Bruce Jones, Faculty Mentor (Department of Automotive Engineering Technology)

The project involves the modification of a 2006 Toyota Prius into a "Plug-In Hybrid Vehicle." Included in this presentation are the type of battery pack chosen, charger created, methods used, costs, plans to keep drivability, modification results affecting performance, emission control, and fuel efficiency. The team utilized the time spent on the project by creating a clean, efficient, and aesthetically pleasing vehicle that gets great fuel economy. The vehicle was tested for emissions, fuel economy, and performance, including drivability. The results were then analyzed for advantages and disadvantages of a production vehicle.

ATV Fuels and Emissions Research

Kurt Gostomczik (Department of Automotive Engineering Technology)
Martin Mogensen (Department of Automotive Engineering Technology)
Fredrick Anderson (Department of Automotive Engineering Technology)
Professor Gary Mead, Faculty Mentor (Department of Automotive Engineering Technology)

Our test vehicle (1987 Yamaha ATV) will be operated on a dynamometer to conduct emissions testing on an ATV while running through the European standardized drive cycle, ECE R-40. The drive cycle is currently used in the European Communities as a standard to test the output of emissions with various ATVs. This is a transient drive cycle (ATV is tested at various speeds and loads over time) that will be used for the emissions testing since there is not a drive cycle used in the United States that would work well with emissions testing of an ATV. Most small engine emissions testing in the United States is conducted on just the engine in a steady state, rather than the vehicle. With using this drive cycle, the data can be compared to the set standards of the ECE R-40. The California emissions bench (analyzes exhaust gas for pollutants) in the MNCAR lab will be used to test the emissions of the ATV. The emissions that will be tested are Carbon Monoxide (CO), Hydrocarbons (HC), Oxides of Nitrogen (NOx), and Carbon Dioxide (C02). To complete emissions testing on the ATV, the motorcycle dynamometer room had to be adapted to test ATVs. To do this a secondary roll was added on the side of the primary roll to accommodate two drive wheels. A platform was also added to the front of the secondary roll to provide an even surface for the four ATV wheels. The motorcycle/ATV dyno is an eddy current dynamometer, which means that it is able to simulate load on the ATV at various speeds. This will allow the emissions data to be successfully tabulated as if the ATV was running in normal driving conditions. The ATV will be operated on three different fuels during testing. The three different fuels will be regular gasoline, a mixture of 10% ethanol and 90% gasoline (E10), and a mix of 20% ethanol and 80% gasoline (E20). Ethanol blended fuels will be used since Minnesota already requires 10% Ethanol in all fuels sold at the pump. That percentage of ethanol mandatory at the pump is going up to 20% by 2013. Drivability of the ATV will be monitored using hot and cold starts and the ATV's performance will be monitored during the drive cycle to note any negative effects that the fuel may have on the ATV.

Mathematical Modeling and Simulation of Multialleic Migration-Selection Models

Chad N. Vidden (Department of Mathematics)
Professor Namyong Lee, Faculty Mentor (Department of Mathematics)

Population ecology is concerned with the growth and decay of specific populations. This field has a variety of applications ranging from evolution and survival at the environmental level to the spread of infectious disease at the cellular and molecular levels. Many ecological circumstances require the use of mathematical methods and reasoning in order to acquire better knowledge of the issue at hand. This study considered and analyzed multiple different mathematical models of population dynamics along with their purposes. This foundation was then applied in order to explore the migration of populations from one isolated region to another along with the relationships that those populations have. The following research paper presents the theoretical base, analysis, and specific simulations of this study along with application.

Music Compiler: An Exercise in the Use of Coroutines

Samuel Crow (Department of Computer & Information Sciences)
Professor Leon Tietz, Faculty Mentor (Department of Computer & Information Sciences)

Conventional music players typically use either interpreters or streamed sound samples. This project presents an alternative to these by compiling a Protracker music file into a stand-alone binary program. The first goal was to create a program that is smaller than a music file that uses a statically-linked interpreter. A secondary goal was to require less overhead than an interpreter or a streamed audio file. The technique of music playback used here is based on coroutines. One coroutine is used for the main music score and additional coroutines are used to perform time indexed special effects for each of the voices. Both the programming language used to implement this compiler and the language of the programs it generates are ANSI C 1989.

Automated Visual Inspection for Discriminating Between Heraldic Devices and Text

Ivan A. Marte (Department of Computer & Information Sciences)
Professor Rebecca Bates, Faculty Mentor, (Department of Computer & Information Sciences)

Members of the Society for Creative Anachronism (SCA) distinguish themselves through heraldic devices, similar to those used in the middle ages. Members submit a drawing of their heraldic artwork, such as that found on coats of arms and family crests, which is then compared to all previously submitted drawings before approval. Because these devices need to be distinct from all previous ones, it would be useful to have an online catalog for members to refer to in preparing their devices. When creating the catalog, it is important to select only the device from a scanned form because the application forms contain personal information that should not be placed on the web. In order to meet this need, we have developed a system for selecting the picture of the device from a scanned image of the application form. We will present a comparison between an edge-detection-based approach and an approach based on optical character recognition (OCR). The edge detection approach finds the edges of the device and selects only the portions of the image within a large, connected edge. The OCR approach selects the largest single "character" in the file, which would be an unrecognized character that contains the image. Comparisons of program size, cost, and extraneous pixels included or excluded will be presented.

Developing Microsoft Word 2007 Add-On Applications

Peter L. Sonnek (Department of Computer Science)
Professor Ann Quade, Faculty mentor (Department of Computer Science)

In 2007, Microsoft released a new version of MS Office that changed the file platform to a universal data format called Extensible Markup Language or XML. XML is meant to be simple, meaningful, and understood by all computer programs. Since Microsoft has moved its file format to XML, tremendous extendibility can be built by software professionals to link MS Office 2007 documents to data not held within the saved documents. This project tested the levels of interactive data between MS Word 2007 and several other XML data sources.

Development of a High Gain Double Spherical Helical Antenna for Wireless Communication

Rumman Kabir (Department of Electrical Engineering)
Mohnish Tuladhar (Department of Electrical Engineering)
Professor Ramakrishna Nair, Faculty Mentor (Department of Electrical Engineering)

Small size antennas have been continuously developed for mobile communications. Spherical Helical Antenna properties were investigated in many cases for better performance. While many desirable characteristics were discovered such as circular polarization over a broad beamwidth and no-sidelobe radiation patterns, the smaller and more compact size of the spherical helix also offers some advantages over the conventional cylindrical helical antenna under certain situations. In this research, we investigated the properties of Double Spherical Helical Antenna which has double spherical windings of different lengths and diameters for better gain, polarization and range. Our goal was to develop this antenna with minimum size to be used for wireless communications for optimum efficiency and lower cost. The performances of the miniaturized antenna constructed were tested, evaluated, and compared to those of traditional antenna structures.

Monday April 23 Presenters

Poster Session A | **1:00-3:00** | **CSU 253/4/5**

Visualization of The Microvasculature Structure of The Rat Sciatic Nerve
Adam W. Sudbeck and Michael W. Witthaus (Department of Biological Sciences)
Professor Michael Bentley, Faculty Mentor (Department of Biological Sciences)

Comparison of Macroinvertebrate Populations Collected with Three Different Methods at Several Location in the Maple River
Tom Burg and Lynn Schultz (Department of Biological Sciences)
Professor Beth Proctor, Faculty Mentor (Department of Biological Sciences)

Identification of Proteins that Interact with Actin Capping Protein
Nathan M. Martinez and Kevin Y.E. Strehler (Department of Biological Sciences)
Professor Marilyn C. Hart, Faculty Mentor (Department of Biological Sciences)

Fetal Effects of Impaired Aldosterone Secretion During Pregnancy in the Rat
Sara Feldbrugge and Benjamin Sticha (Department of Biological Sciences)
Professor Penny Knoblich, Faculty Mentor (Department of Biological Sciences)

Determination of the Optimal Concentration of Medium Supplements Promoting the Recovery of Dormant Mycobateria in Culture
Kelly E. Rock (Department of Biological Sciences)
Professor Timothy E. Secott, Faculty Mentor (Department of Biological Sciences)

Adherence of Earthworm Coelomic Cells
Kristy Felske and Julie Milbrett (Department of Biological Sciences)
Professor Dorothy M. Wrigley, Faculty Mentor (Department of Biological Sciences)

Fingerprint Pore Structure in the Monkey
Laurie Colson (Biological Sciences)
Professor Michael Bentley, Faculty Mentor (Biological Sciences)

Effects of Cattail and Bulrush Root Extracted with 4 Four Different Solvents on the Germination and Growth of Lettuce Seeds
Jessica Biever (Department of Biological Sciences)
Professor Beth Proctor, Faculty Mentor (Department of Biological Sciences)

Comparison of Biotic Indices to Evaluate Stream Health of the Le Sueur River Basin
James Fett (Department of Biological Sciences)
Professor Shannon J. Fisher, Faculty Mentor (Department of Biological Sciences)

Antibiotic Resistance of Enteric Microorganisms Isolated From River Water
Elizabeth Mauland and Erik Miller (Department of Biological Sciences)
Professor Timothy Secott, Faculty Mentor (Department of Biological Sciences)

Visualization of The Microvasculature Structure of The Rat Sciatic Nerve

Michael W. Witthaus (Department of Biological Sciences)
Adam W. Sudbeck (Department of Biological Sciences)
Professor Michael Bentley, Faculty Mentor (Department of Biological Sciences)

The vascular supply to the peripheral nerves is important for axon maintenance and survival. Little information is known about the architecture of the microvasculature and capillary beds of peripheral nerves. The microvasculature architecture of sciatic nerves from male adult Wistar Kyoto rats were visualized by scanning electron microscopy. To visualize the vessels, a relatively new PU4ii polyurethane-based casting resin was infused into the aorta. The sciatic nerves were dissected after the resin completely polymerized. The nerves were placed in concentrated potassium chloride solution. The resulting casts were critical point dried, sputter coated with gold palladium and analyzed via scanning electron microscopy. The arterial supply and venous drainage were visible running parallel to the sciatic nerve. Capillary networks extended between the longitudinally arranged arterioles and venuoles. The arrangement may have relevance in experimental neuropathic conditions such as diabetes mellitus.

Comparison of Macroinvertebrate Populations Collected with Three Different Methods at Several Location in the Maple River

Lynn Schultz (Department of Biological Sciences)
Tom Burg (Department of Biological Sciences)
Professor Beth Proctor, Faculty Mentor (Biological Sciences)

Benthic macroinvertebrates (spineless organisms that live in water and are visible with the naked eye) are being used as indicators of water quality. The purpose of our research was to determine if three different methods of collecting macroinvertebrates produced similar information on the number and types of organisms collected. Two different types of artificial substrates (Hester-Dendy (multi plate) and Brick-Scrubby) were placed at four sampling sites in the Maple River. The artificial substrates were collected after 5 or 6 weeks (May 28, 2006-July 5 or 11, 2006) in the water at each site. The day the artificial substrates were collected, macroinvertebrates were also collected using the timed-pick method. We will discuss the similarities and differences between the number, species and feeding groups of macroinverterates found at each site with the different sampling techniques. We will discuss the implications of these results on development of biological water quality criteria standards using macroinvertebrates.

Identification of Proteins that Interact with Actin Capping Protein

Kevin Y.E. Strehler (Department of Biological Sciences)
Nathan M. Martinez (Department of Biological Sciences)
Professor Marilyn C. Hart, Faculty Mentor (Department of Biological Sciences)

Actin, a component of all eukaryotic cells, plays an important role in maintaining cell structure and contributes to cell motility. Actin is regulated by a variety of accessory proteins including actin capping protein (CP). CP attaches to the barbed end of actin filaments regulating length and stability. CP is composed of two subunits, an alpha (α) and a beta (β) subunit. In vertebrates, three alpha isoforms ($\alpha1$, $\alpha2$, $\alpha3$) and three beta isoforms ($\beta1$, $\beta2$, $\beta3$) have been identified. The $\beta1$ isoform is the predominant isoform of muscle, whereas the $\beta2$ isoform is the predominant isoform of nonmuscle. Previous transgenic studies indicate that $\beta1$ and $\beta2$ are functionally distinct in murine myocardium and might interact with novel proteins. We are using a yeast two hybrid genetic screen to identify proteins that interact with $\beta1$ and $\beta2$. We have generated the appropriate constructs, confirmed their orientation, and expression. We have also amplified a mouse embryonic cDNA library. The screen is ongoing.

Fetal Effects of Impaired Aldosterone Secretion During Pregnancy in the Rat

Benjamin Sticha (Department of Biological Sciences)
Sara Feldbrugge (Department of Biological Sciences)
Professor Penny Knoblich, Faculty Mentor (Department of 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 has 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 the role of these adrenal hormones in fetal development. At 8 weeks of age, females had either the adrenal-freezing surgery, or the sham surgery, and were allowed 10 days to recover. Rats were mated and fetuses collected on gestation day 20. Fetal number, fetal weights, and fetal kidney weights were recorded. The uterus was inspected for evidence of fetal resorption, which indicates fetal or maternal stress. Finally, blood was collected for hormone assays to confirm the reduction of adrenal hormones.

Determination of the Optimal Concentration of Medium Supplements Promoting the Recovery of Dormant Mycobateria in Culture

Kelly E. Rock (Department of Biological Sciences)
Professor Timothy E. Secott, Faculty Mentor (Department of Biological Sciences)

Johne's disease is a chronic intestinal disease of cattle that is caused by *Mycobacterium avium* subsp. *paratuberculosis* (Mpt). Diagnostic testing is typically unrewarding until years after infection, consequently leading to massive spread of Mpt and substantial economic loss. Previous experimentation showed that reducing oxygen tension through the use of a reducing agent, Oxyrase, or supplementing the medium with Mpt-conditioned medium improved the recovery of Mpt from dormancy. However, while the concentration of conditioned medium that improved recovery was relatively constant, that of Oxyrase varied widely from experiment to experiment. In order to determine whether this was a consequence of the percent of viable cells in dormant cultures, we used a two-color fluorescence assay to estimate cell viability and compare these data with the concentration of conditioned medium or Oxyrase. A standard curve was prepared for Mpt using a BacLight Live:Dead fluorescence kit. The standard curve was used to calculate the ratio of viable to nonviable organisms in dormant Mpt cultures. Two-fold serial dilutions of Mpt conditioned medium or Oxyrase was added to cultures of dormant Mpt in rich medium and growth was monitored by measuring optical density for up to 21 days. A determination of the relationship between cell viability and the effectiveness of recovery promotants is in progress and will be reported.

Adherence of Earthworm Coelomic Cells

Kristy Felske (Department of Biological Sciences)
Julie Milbrett (Department of Biological Sciences)
Professor Dorothy M. Wrigley, Faculty Mentor (Department of Biological Sciences)

Earthworms have a mobile cell population in the coelomic cavity which mediates several defenses against bacterial invasion. One of the defenses is phagocytosis, ingesting and degradation of foreign material. The first step in phagocytosis is adherence of the phagocytic cell to the foreign material. Adherence can be measured through the binding of cells to plastic surfaces. An assay was developed to determine the adherence capabilities of the cells on plastics. Proteins released following inflammatory signals may assist the binding. For this project, coelomic cells were collected from earthworms and placed in plastic wells. After a 20 min to 1 hour incubation, the wells are washed and adhered cells counted. Prior to addition of cells to the wells the wells, were treated with coelomic fluid from worm stimulated with the bacterium Micrococcus luteus, or coelomic fluid from unstimulated worms. Data will be presented on the adherent properties of the coelomic cells.

Fingerprint Pore Structure in the Monkey

Laurie Colson (Biological Sciences)
Professor Michael Bentley, Faculty Mentor (Biological Sciences)

The sweat pores associated with the friction ridges of the hands and feet may have some applicability in forensic science and criminal investigation. I examined friction pads taken from the hands of a macaque monkey, obtained commercially, for consistent patterns in the shape, size, and placement of sweat pores. Samples were critical point dried, sputter coated, and viewed using a scanning electron microscope. I found some correspondence in sweat pore shape and location on the friction ridge, but little consistency in terms of size. These results suggest that sweat pore analysis may not be a useful technique in forensic science.

Effects of Cattail and Bulrush Root Extracted with 4 Four Different Solvents on the Germination and Growth of Lettuce Seeds

Jessica Biever (Department of Biological Sciences)
Professor Beth Proctor, Faculty Mentor (Department of Biological Sciences)

Typha angustifolia (cattail) and *Scirpus fluviatilis* (bulrush) are two wetland plants. Cattails are among the first wetland plants to colonize an area of newly exposed mud and can out-compete bulrush to dominate wetland systems. Recent literature has implied that *T. angustifolia* may produce chemicals that inhibit or retard the growth of other wetland plants. The purpose of our research was to determine if the roots of the cattail and the bulrush produced such chemicals by applying their root extracts to lettuce seeds. Ten cattails and 10 bulrushes were planted alone into individual buckets, and 10 cattails were planted with 10 bulrushes in individual buckets. In addition, three buckets with 2 cattails each and three buckets with 2 bulrushes each were prepared. At the end of 100 days, selected buckets were harvested. The shoots were separated from the roots and wet and dry biomass was determined for each plant. Roots were crushed and serially extracted with methanol, dichloromethane, ethyl ether and hexane. Lettuce seeds were treated with the various root-solvent extracts. Both germination of the lettuce seeds and growth of the seeds (sprout length) were recorded for one week. Controls (lettuce seeds treated only with the solvents) were also employed. The results of this study are presented.

Comparison of Biotic Indices to Evaluate Stream Health of the Le Sueur River Basin

James Fett (Department of Biological Sciences)
Professor Shannon J. Fisher, Faculty Mentor (Department of Biological Sciences)

My research was done to assess the stream health of the Le Sueur River Basin, compare the efficiency of using ichthyofauna vs. macroinvertebrate sampling protocols as biotic indicators of stream health, and to determine if these protocols are correlated. There were 36 sites sampled within the Le Sueur River Basin (area that drains into the Le Sueur River including the Le Sueur River itself, along with its tributaries). These sites were sampled using macroinvertebrate and ichthyofauna sampling techniques. Macroinvertebrates were sampled using kick nets at each site. Hester-Dendy artificial substrate samplers were also placed at each site for a 6-week colonization period. Ichthyofauna was sampled by the means of electroshocking. All organisms collected were preserved and kept for further identification. I, along with other WRC student workers, have identified the macroinvertebrates in each sample to the family level, and the ichthyofauna to the genus and species level. I will present the similarities and differences of the Family Biotic Index of macroinvertebrates and the Index of Biotic Integrity of ichthyofauna for each site along with the time and cost of determining each index. I will also recommend the use of one or both of the indices to measure stream health effectively and to save time and money.

Antibiotic Resistance of Enteric Microorganisms Isolated From River Water

Elizabeth Mauland (Department of Biological Sciences)
Erik Miller (Department of Biological Sciences)
Professor Timothy Secott, Faculty Mentor (Department of Biological Sciences)

Pathogenic bacteria can acquire antimicrobial resistance genes from non-pathogenic organisms present in the environment. Such traits can be selected for and enhanced by prolonged exposure to subtherapeutic doses of antimicrobials. When these traits become established in non-pathogenic Gram-negative enteric bacteria such as coliforms, the chances of eventual transfer to pathogens such as *Salmonella* and *Shigella* increase. In order to determine whether coliforms isolated from water could potentially serve as a reservoir for antimicrobial resistance, we evaluated antimicrobial resistance in *Escherichia coli* and related organisms isolated from water samples taken from the Minnesota River Basin. *E. coli* and other isolates recovered from water samples were tested for susceptibility to a range of concentrations of ampicillin and tetracycline, and the minimum concentration of either antibiotic needed to prevent the growth of each isolate (MIC) was determined. The range of drug concentrations studied for each drug was chosen based on clinically relevant concentrations. Present data indicated that tetracycline MICs for *E. coli* ranged from 2-4 micrograms/ml, while MICs for ampicillin were greater than 32 micrograms/ml. These data will constitute a baseline for the monitoring of antibiotic resistance coliforms isolated from water in South Central Minnesota.

Monday April 23 Presenters

Poster Session B **1:00-3:00** **CSU 253/4/5**

Effect of Vitamin E on Phosphofructokinase Activity in Acute Metabolically Stressed Rats
Katrina Sandeberg (Department of Chemistry & Geology)
Professor Mary Hadley, Faculty Mentor (Department of Chemistry & Geology)

Fluoroquinalone Antibiotics and Cadmium Mobilities in Soil Environments
Aaron L. Danberry (Department of Chemistry & Geology)
Professor Trenton Vorlicek, Faculty Mentor (Department of Chemistry & Geology)

Move Over Tiger and Vijay, Marketing Could Bring More Diversity
Alecia Prins (Department of Marketing)
Professor Vicki Luoma, Faculty Mentor (Department of Accounting & Business Law)

Vascular Architecture of the Liver in SHR and WKY Rats
Charalette Mathwig and Ken Willaert (Department of Chemistry & Geology)
Professor Michael Bentley, Faculty Mentor (Department of Biological Sciences)

Does Maternal Aldosterone Regulate Placental 11-Beta Hydroxysteroid Dehydrogenase Expression in Rats?
Emmanuel Achu and Justin Rocheleau (Department of Chemistry & Geology)
Professors Penny Knoblich (Department of Biological Sciences), James Rife, and Theresa Salerno, Faculty Mentors (Department of Chemistry & Geology)

Variations in Transition Metal Ion Speciation Due to Differences in Dissolved Organic Matter
Richard Wienhold (Department of Chemistry & Geology)
Professor John Thoemke, Faculty Mentor (Department of Chemistry & Geology)

Investigation of Aqueous Chromium (III) Complexation Chemistry and its Implications for a Common Laboratory Procedure
Marjorie J. Ploeger (Department of Chemistry & Geology)
Professors Kevin J. Boyd and Daniel J. Swart, Faculty Mentors (Department of Chemistry & Geology)

Gas Washing Analysis: Revealing Profitable Oil Reserves
Andrew Dickinson (Department of Chemistry & Geology)
Professors Steven Losh and Daniel Swart, Faculty Mentors (Department of Chemistry & Geology)

Spending, Food Choices and Diet-related Health of College Students
Kathryn Peters (Department of Family and Consumer Science)
Professor Susan Fredstrom, Faculty Mentor (Department of Family and Consumer Science)

Population of Northern Leopard Frogs (Rana Pipiens) Migrating Between the Ney Frog Pond and the Minnesota River Valley for Spring Breeding
Rebecca Madison Pollack (Department of Geography)
Professor Forrest Wilkerson, Faculty Mentor (Department of Geography)

Effect of Vitamin E on Phosphofructokinase Activity in Acute Metabolically Stressed Rats

Katrina Sandeberg (Department of Chemistry & Geology)
Professor Mary Hadley, Faculty Mentor (Department of Chemistry & Geology)

Reactive oxygen species and free radicals generated in oxidative stress, during conditions of metabolic stress as seen in illness, are occupied in tissue injury and dysfunction of the mitochondria with depletion of ATP. A pro-oxidant/antioxidant imbalance is commonly found in disease states, and the excess of pro-oxidant may cause muscle cell injury. An increase in antioxidant status could be attained by diet supplementation, which will regain the favorable level of antioxidant status and slow the progress of disease by limiting the decline of phosphofructokinase (PFK) activity, a major enzyme in glycolysis. Intramuscular injections of an antioxidant, such as vitamin E, may help patients recover more rapidly without feeding. A rat model of metabolic stress was created using "zymosan," (Z) a nonbacterial, nonendotoxic agent. Sixty male Wistar rats (BW 250-300 g) were obtained from Harlan and divided randomly into groups: Control, Pair-Fed, Zymosan-injected (ZI) day two, ZI day seven, vitamin E and ZI day two, and vitamin E and ZI day seven. Stressed rats received either Z (50 mg per / Kg BW) or Z and vitamin E injections. Surgeries were preformed two and seven days after injections; four muscles from both hind legs, the soleus, the extensor digitorum longus, and the red and white gastrocnemius, were isolated and extracted by freeze clamping. Analysis of PFK activity is currently being performed by fluorescence using a Fluorscan Microplate Reader. We hypothesize the antioxidant vitamin, vitamin E, will inhibit the decline in activity of PFK observed in acute metabolically stressed rat models.

Fluoroquinolone Antibiotics and Cadmium Mobilities in Soil Environments

Aaron L. Danberry (Department of Chemistry & Geology)
Professor Trenton Vorlicek, Faculty Mentor (Department of Chemistry & Geology)

Human and livestock wastes are often applied to agricultural fields as fertilizers. These wastes may contain up to mg-kg^{-1} concentrations of antibiotics and potentially toxic metals (e.g., Cd, Pb, Zn, Cu, Ni). The impact of these components on public health requires a thorough knowledge of their fate and transport in soil systems. Several common antibiotics, including the fluoroquinolone and quinolone classes, are known to readily complex divalent metals commonly leached from human and animal wastes. These interactions may affect the mobility of metals by influencing the partitioning between metals in aqueous and sorbed phases. The common clay minerals, illite and kaolinite were chosen for comparison in this study because of their abundance in soil systems and difference in cation exchange capacities. Test slurries were prepared to study the uptake of several metals (e.g., Cd, Pb, Cu) in the presence and absence of varying concentrations of antibiotics (e.g., ciprofloxacin, norfloxacin, oxolinic acid, nalidixic acid) at near groundwater pH and constant ionic strength using a p-nitrophenol buffer. Preliminary data indicates Cd readily adsorbs to both illite and kaolinite in the presence of antibiotics. Research including the addition of variable concentrations of antibiotics to Cd containing slurries is ongoing.

Vascular Architecture of the Liver in SHR and WKY Rats

Charalette Mathwig (Department of Chemistry & Geology)
Ken Willaert (Department of Biological Sciences)
Professor Michael Bentley, Faculty Mentor (Department of Biological Sciences)

The liver is a highly complex vascular organ containing an intricate network of arteries, arterioles, portal veins, veins, venules, and capillaries. This complex network could change in situations related to vascular disease such as hypertension. We examined the vasculature in rat livers by scanning electron microscopy. The tissue was prepared by perfusing either Mercox resin or polyurethane resin into the vasculature. Once the resin polymerized, each liver was placed in concentrated potassium hydroxide to corrode the tissue from the vascular casts. The casts were critical point dried, sputter coated with gold-palladium, and viewed by scanning electron microscopy. Examination of the vascular architecture showed the circulatory patterns in the various lobes of the liver. The capillaries from the arterial and portal venous supply were continuous with the venous drainage. The information gathered in this study may aid ongoing research in hypertension studies and future studies involving liver regeneration.

Does Maternal Aldosterone Regulate Placental 11-Beta Hydroxysteroid Dehydrogenase Expression in Rats?

Emmanuel Achu (Department of Chemistry & Geology)
Justin Rocheleau (Department of Chemistry & Geology)
Professor Theresa Salerno, Faculty Mentor (Department of Chemistry & Geology)
Professor James Rife, Faculty Mentor (Department of Chemistry & Geology)
Professor Penny Knoblich, Faculty Mentor (Department of Biological Sciences)

The aim of this project was to investigate whether maternal aldosterone levels regulate the expression of 11-beta hydroxysteroid dehydrogenase (11-βHSD) in the rat placenta. Two isoforms of this enzyme, 11-βHSD type I and type II, have been reported. It has been proposed that in the placenta, these enzymes protect the fetus from the maternal glucocorticoids. The purpose of this project was to measure the levels of 11-βHSD type I and type II mRNAs in the placenta of rats which have different maternal aldosterone levels. In this project, one set of rats had their adrenal medulla, the aldosterone producing layer, destroyed by freezing. The control group of rats had a sham operation. These surgeries were performed by Dr. Knoblich's research group. Placenta from both pregnant experimental and control Wistar-Kyoto (WKY) and Spontaneously Hypertensive rats (SHR) were collected and frozen in liquid nitrogen at day 21 of term. RNA was isolated from the placenta and was used to synthesize cDNAs using RT-PCR. Selective PCR primers were used to specifically amplify each of the two isoenzyme cDNAs in separate experiments. PCR products were quantified relative to an internal standard 18S RNA. The method was optimized to obtain similar amounts of internal standard and 11-βHSD cDNAs in the linear range of the amplification curves.

Variations in Transition Metal Ion Speciation Due to Differences in Dissolved Organic Matter

Richard Wienhold (Department of Chemistry & Geology)
John Thoemke, Faculty Mentor (Department of Chemistry & Geology)

We explored the interaction of dissolved organic matter (DOM) and transition metal ions. We use the competing ligand exchange method with Chelex resin to determine the binding kinetics of DOM from several natural waters and several transition metals. Then, we used the kinetic data to attempt to correlate variations in the DOM binding with the characteristics of the DOM excitation-emission fluorescence spectra. The competing ligand exchange results suggested that dissolved organic matter with a strong terrestrial component releases the metal ion at a faster rate.

Investigation of Aqueous Chromium (III) Complexation Chemistry and its Implications for a Common Laboratory Procedure

Marjorie J. Ploeger (Department of Chemistry & Geology)
Professor Kevin J. Boyd, Faculty Mentor (Department of Chemistry & Geology)
Professor Daniel J. Swart, Faculty Mentor (Department of Chemistry & Geology)

A common analytical laboratory procedure is the simultaneous determination of cobalt (II) and chromium (III) ions in aqueous solutions using visible absorption spectroscopy and spectrometry. However, it has been noticed that Cr (III) ions in aqueous solutions freshly prepared from the chloride salt exhibit a slow yet distinct absorption shift corresponding to a color change from green to blue that takes place on a timescale of ~ 24 hours under "normal" laboratory conditions. Previous literature studies have suggested that Cr (III) complexation chemistry in an aqueous medium is quite complex. Our preliminary spectroscopic studies utilizing factor analysis have suggested that this color change is due to a multi-step reaction process involving chloride/water exchange. To date, we are unaware of any sources that have commented on the affect of this color shift on the analytical validity of this undergraduate laboratory procedure.
The presented research investigates the temperature, concentration, and pH dependence of this absorption shift. This kinetic and thermodynamic data was used to elucidate the nature of the multi-step processes and structure of the proposed intermediates. While it has been assumed that Cr (III) and Co (II) do not interact in aqueous solutions, our study also investigates the possibility that Co (II) ions may also become involved in oligomer formation when both ions are present in solution. The implications of the existence of Cr (III) intermediates and possible Co (II) complexes for the simultaneous determination of Cr (III) and Co (II) by this procedure will be discussed.

Gas Washing Analysis: Revealing Profitable Oil Reserves

Andrew Dickinson (Department of Chemistry & Geology)
Professor Steven Losh, Faculty Mentor (Department of Chemistry & Geology)
Professor Daniel Swart, Faculty Mentor (Department of Chemistry & Geology)

Crude oil slowly floats up through sediment below the earth's surface and is trapped in reservoirs, while natural gas ascends at a faster rate. When mixed together, natural gas dissolves into crude oil. When more natural gas is present than can be dissolved, it escapes from the crude oil, taking with it some of the lighter hydrocarbon compounds from the crude oil. This stripping of hydrocarbons is known as gas washing and is the focus of this research project. We have developed a program for the gas chromatograph here at MSU, Mankato, which has enabled us to analyze many different oil samples taken from a variety of oil wells offshore Louisiana in the Gulf of Mexico. This is the first time oil analysis of the type has been done on this campus. Previous work along a single transect showed that gas washing typically decreases in the offshore direction. We have analyzed samples from a number of oil fields along a parallel transect about 50 miles east of the first one to test the hypothesis that gas washing generally decreases with distance from the shoreline. We have interpreted the analytical results and have come up with some preliminary conclusions as to the trend of gas washing over a large area, as well as some thoughts about what controls the extent of gas washing based on the data. Finally, we have done some calculations concerning the economic significance of this process that could be of use to industry exploring in this region.

Spending, Food Choices and Diet-related Health of College Students

Kathryn Peters (Department of Family & Consumer Science)
Professor Susan Fredstrom, Faculty Mentor (Department of Family & Consumer Science)

We hope to find how economics affect students' food choices, and how that in turn may affect diet-related health. It is well documented that the adverse affects of inadequate nutrition are prominent in the poor, low-educated population. We intend to see if poor, yet well-educated college students will follow similar trends. A survey was sent out by email on the survey tool Zoomerang to a random sample of MSU students. The majority of people surveyed were between the ages of 20-22 years old. Most reported that a majority of their food came from groceries prepared at home and they spent $10-$25 per week on groceries. Ironically, they spent the same amount of money at restaurants and bars as they did for groceries. Personal preference was the main motivating force behind determining food purchases, but students claim to be moderately concerned about eating nutritious food. The majority of students eat lean meats, whole grains, and get at least seven servings of a combination of fruits and vegetables per week. The results showed that for the most part this group of college students eat fairly well and maintain a healthy BMI. Students living off campus claim they eat most meals from groceries prepared at home, but spend an equal amount of money at restaurants and bars. Their education assists them in choosing healthier options even though funds are limited.

Population of Northern Leopard Frogs (Rana Pipiens) Migrating Between the Ney Frog Pond and the Minnesota River Valley for Spring Breeding

Rebecca Madison Pollack (Department of Geography)
Professor Forrest Wilkerson, Faculty Mentor (Department of Geography)

The Northern Leopard Frogs (Rana pipiens) found at the Ney Nature Center (NNC) are particularly important to the NNC as they are the initial population of frogs found deformed in 1995. As bio-indicators, frog populations can be used to assess the health of their surrounding environment. This study used standard herpetological field methods to gain a population estimate of Northern Leopard Frogs and the migration route used by these frogs as they moved up the bluffs of the Minnesota River Valley from their wintering site to the Ney Frog Pond for spring breeding. The results gathered provides the Ney Environmental Education Foundation (NEEF) an estimated population and route of migration, which allows them to put in place measures to continue to monitor and protect the eco-system of the Ney Nature Center and specifically the Northern Leopard Frogs found on-site. NEEF has committed to preserve, protect, and enhance the natural environment of the NNC.

Tuesday April 24 Presenters

Session 9 | **8:30-9:30** | **CSU 284**

Performing Arts

The Dancing Body in American Concert Dance as a Social Barometer of Change
Rachel Nachreiner (Department of Theatre and Dance)
Professor Julie Kerr-Berry, Faculty Mentor, (Department of Theatre and Dance)

Impact of Japanese Flower Arrangement
Harumi Okoshi (Department of Art)
Professor Liz Miller, Faculty Mentor (Department of Art)

An MSU Feature Presentation
Philip C. Warren (Department of Theatre and Dance)
Professor Paul Finocchiaro, Faculty Mentor (Department. of Theatre and Dance)

The Dancing Body in American Concert Dance as a Social Barometer of Change

Rachel Nachreiner (Department of Theatre and Dance)
Professor Julie Kerr-Berry, Faculty Mentor, (Department of Theatre and Dance)

Every culture utilizes dance in its own way. Since the beginning of time, dance has revealed the cultural values and beliefs systems of all people. This paper addresses the fact that dance is an indicator of social change. The paper investigates the dance/movement vocabulary of four major historical eras during the 20th century in America. This movement vocabulary is then compared to the dance traditions characteristic of West Africa and Europe. By charting what the dancing body reveals through a timeline, this paper shows how American culture has developed from the fusion of African and European cultures; from the beginning of the transatlantic slave trade, through the 20th century, and progression into the 21st century.

Impact of Japanese Flower Arrangement

Harumi Okoshi (Department of Art)
Professor Liz Miller, Faculty Mentor (Department of Art)

Japanese flower arrangement or Ikebana symbolizes heaven, earth, and humankind and creates an inviting and hospitable atmosphere. The difference between Western flower arrangement and Ikebana is in the linear construction and rhythm. My attendance of Ikebana class in MY and an interview of Japanese professional Ikebana artist, Noritaka Noda, helped me to understand the importance and meaning of Ikebana. Not only the flowers but also the vase, stems, leaves, and branches are all important pieces that need to be balanced with one another. Like other art forms, Ikebana serves to express the feelings of the artist, but it also expresses the climate of the physical environment. Some of the these expressions are quiet and calm, while others are more dramatic and powerful. The use of lines and balance in Ikebana are quite important in communicating these feelings to the viewers. I will introduce the beauty of my own culture with a demonstration that will show the importance of the relationship between flower and vase in the art of Ikebana.

An MSU Feature Presentation

Philip C. Warren (Department of Theatre and Dance)
Professor Paul Finocchiaro, Faculty Mentor (Department of Theatre and Dance)

What would you do if your loved one were raped? How does one face the degradation of sexual violence and find their way back to a normal life? At what point does a longing for revenge preclude the need for healing? This fictional drama launches us into the painful story of a couple trying to answer these questions for themselves. Mistakes are made, tears give way to blood and darkness grows. In this, my first feature film, I give not answers, but ask much needed questions. Coalescing my work in theatre and women's studies, I present to you a visual feast for the mind and the heart.

Tuesday April 24 Presenters

Session 10	8:15-10:30	CSU 201

Business and Marketing

Wild Rice: National Food or Sacred Crop?
Nathan Kofstad (Department of Management), Andrea Laabs (Department of Accounting & Business Law), Steven Loerzel (Department of Economics), and Mark Mageskau (Department of Construction Management)
Professor Vicki Luoma, Faculty Mentor (Department of Accounting & Business Law)

Black Gold in the White Arctic
Matt Suess, Kevin Soukop, Joe Serdar (Department of Accounting & Business Law), and Adam Simon (Department of Management)
Professor Vicki Luoma, Faculty Mentor (Department of Accounting & Business Law)

Analysis of Polar Bear Protection Legislation
Ryan Thompson, William Meyer, and Brad Heitzinger (Department of Accounting & Business Law)
Professor Vicki Luoma, Faculty Mentor, (Department of Accounting & Business Law)

Boundary Water Canoe Area and Wildlife Area Laws
Chrissy Robinson, Kate Samuelson, and Kacie Schimmel (Department of Accounting & Business Law)
Professor Vicki Luoma, Faculty Mentor (Department of Accounting and Business Law)

Investigating the Perceived Present and Future Benefits of Using Accounting Related Software in Account Courses
Christina Emmert and Jolene Sieben (Department of Accounting & Business Law)
Professor Paul Schwinghammer, Faculty Mentor (Department of Accounting & Business Law)

How the 2002 Sarbanes-Oxley Act Affects Regional CPA Firms
Krista Gillen, Irina Kansakar, and Kaitlyn Moll (Department of Accounting & Finance)
Professor Thomas Olach, Faculty Mentor (Department of Accounting)

Renewable Energy in Minnesota
Brandon Ball (Department of Construction Management), Drew Boland (Department of Accounting & Business Law),Tess Christensen (Department of English), and Joanna Fries (Department of Management)
Professor Vicki Luoma, Faculty Mentor (Department of Accounting & Business Law)

Greenroofs, An Urban Oasis
Ryan Thompson (Department of Finance), William Meyer (Department of Management), Brad Heitzinger (Department of Political Science & Law Enforcement)
Professor Vicki Luoma, Faculty Mentor (Department of Accounting & Business Law)

Mankato's Water: Is It Clearly the Best Choice?
Chris Kulzer, Kevin Wittbrot (Department of Accounting & Business Law), and Krista Wassenaar (Department of Civil Engineering)
Professor Vicki Luoma, Faculty Mentor (Department of Accounting & Business Law)

Wild Rice: National Food or Sacred Crop?

Nathan Kofstad (Department of Management)
Andrea Laabs (Department of Accounting & Business Law)
Steven Loerzel (Department of Economics)
Mark Mangskau (Department of Construction Management)
Professor Vicki Luoma, Faculty Mentor (Department of Accounting & Business Law)

Wild rice may not seem like it is an important crop to most, but to the Anishinaabeg it is a way of life. Since they have inhabited the Great Lakes area, the Anishinaabeg have harvested wild rice and it has become a staple food and a major source of income for the community. Today, the University of Minnesota is conducting research in genetic engineering to produce an easier to grow species of wild rice that has the potential to cross pollinate with the wild rice that the Anishinaabeg harvest. The introduction of a new species of wild rice carries with it the potential to sterilize the natural form of wild rice, causing extreme hardship for the Anishinaabeg. Not only would this have a disastrous effect on the Anishinaabeg's income, but it would destroy their sacred crop, which is very important to their cultural traditions. While genetic engineering of plants and crops does not generally raise a legal issue, in this case legal issues do arise because of the existence of a long history of treaties and other legal precedents involving the Anishinaabeg. This research project will examine the legal authority that applies in this instance and whether treaty rights would be violated by the introduction of genetically engineered wild rice into the natural environment.

Black Gold in the White Arctic

Matt Suess (Department of Accounting & Business Law)
Kevin Soukup (Department of Accounting & Business Law)
Adam Simon (Department of Management)
Joe Serdar (Department of Accounting & Business Law)
Professor Vicki Luoma, Faculty Mentor (Department of Accounting & Business Law)

In light of recent volatility in the price of oil and gasoline in the United States, interest in opening up oil fields in the Alaskan wilderness has risen. Competing interests in developing oil resources to reduce the United States' dependence upon foreign oil include environmental concerns and the interests of Native Alaskan tribes. The 19.6 million acre Arctic Refuge is part of the only fully intact and unbroken continuum of arctic and sub-arctic ecosystems in the world. There are currently 45 different species of animals living in the refuge including: caribou, moose, foxes, wolves, grizzlies, and polar bears. There are two different Native Alaskan tribes: The Inupiat Eskimos, who live along the North Alaskan Coast, and the Gwich'in, who live in Arctic Village, both have differing views on the issue. This research project will examine the legal issues and competing interests involved in developing oil resource in the Alaskan wilderness.

Analysis of Polar Bear Protection Legislation

Ryan Thompson (Department of Accounting & Business Law)
William Meyer (Department of Accounting & Business Law)
Brad Heitzinger (Department of Accounting & Business Law)
Professor Vicki Luoma, Faculty Mentor, (Department of Accounting & Business Law)

On February 16, 2005, the Center for Biological Diversity filed a scientific petition with the U.S. Fish and Wildlife Service to list the polar bear as a threatened species under the Endangered Species Act. This classification is in result of increasingly rapid destruction of artic habitat. Growing concern among the scientific community, that global warming is the main culprit in destruction of artic habitats. Direct correlations established during recent environmental studies have yielded findings of polar bear starvation and decreased offspring birth. The increasing polar temperatures have directly impacting the reduction of polar bear habitat consisting of glacial ice. Current legislation in effect to properly protect these areas and this species has been found lacking. This project will research current laws and determine what amendments are needed, to curtail the impact on the polar bears. Recommended new legal actions consisting of glacial ice habitat protection and environmental regulations must be pursued.

Boundary Water Canoe Area and Wildlife Area Laws

Chrisy Robinson (Department of Accounting & Business Law)
Kate Samuelson (Department of Accounting & Business Law)
Kacie Schimmel (Department of Accounting & Business Law)
Professor Vicki Luoma, Faculty Mentor (Department of Accounting & Business Law)

The region between Minnesota and Ontario, and west of Lake Superior is known as the Boundary Waters Canoe Area. The Boundary Waters Canoe Area are full of wilderness and semi-wilderness lakes, rivers, and forests. The wilderness area is a highly toured area for canoeing, camping, exploring, relaxation, quiet and fishing. This paper will describe what laws keep this region of the U.S. protected, how the protection process works, and will compare the laws that protect the Boundary Waters to other comparable lands in the United States such as the Glacier National Forest and Park Area.

Investigating the Perceived Present and Future Benefits of Using Accounting Related Software in Account Courses

Jolene Sieben (Department of Accounting & Business Law)
Christina Emmert (Department of Accounting & Business Law)
Professor Paul Schwinghammer, Faculty Mentor (Department of Accounting & Business Law)

Accounting-related software is commonly used in higher-level accounting courses to enhance students' understanding of basic accounting and auditing principles. The research focused on determining how accounting students and professionals viewed the usefulness of the accounting-related software currently taught in courses at Minnesota State University, Mankato. Students rated the usefulness of the software in terms of helping them understand the course material and providing future benefits in the workplace. The survey also asked students for suggestions about other accounting-related software that would be beneficial to integrate into their coursework. Professionals were surveyed on the proficiency of recent graduates in the accounting-related software taught in undergraduate courses and the benefits of including such software in accounting courses. In addition, professionals listed the types of software they would prefer be taught in accounting courses at Minnesota State University, Mankato.

How the 2002 Sarbanes-Oxley Act Affects Regional CPA Firms

Irina Kansakar (Department of Accounting & Finance)
Kaitlyn Moll (Department of Accounting & Finance)
Krista Gillen (Department of Accounting & Finance)
Professor Thomas Olach, Faculty Mentor (Department of Accounting &Finance)

Section 404 of the Sarbanes-Oxley Act (SOA), passed in 2002, requires Certified Public Accountant (CPA) firms to verify management's evaluation of internal controls while simultaneously auditing the company's financial statements. Section 404 has resulted in increasingly complex compliance procedures and closer scrutiny over internal controls for both managers and auditors. This new requirement may be costly and require additional resources from both CPA firms and their clientele. The increase in costs and resources may be more burdensome if companies employ CPA firms that lack the necessary skills to perform Section 404 compliance work. This research seeks to determine if regional CPA firms are up-to-date with Section 404 compliance and what significant issues they have encountered since the Section's passing. If results indicate that regional CPA firms are in need of further guidance regarding Section 404, regional educational institutions and CPAs knowledgeable of Section 404 requirements may help assist firms and their clientele by offering seminars, workshops, and/or conferences to enhance their skills in meeting Section 404 requirements. Furthermore, an indication that CPAs are lacking in knowledge of Section 404 may suggest that it is time for universities to add more instruction regarding Section 404, and/or the SOA, to their undergraduate and graduate degree business program curriculums.

Renewable Energy in Minnesota

Brandon Ball (Department of Construction Management)
Drew Boland (Department of Accounting & Business Law)
Tess Christensen (Department of English)
Joanna Fries (Department of Management)
Professor Vicki Luoma, Faculty Mentor (Department of Accounting & Business Law)

Time has shown how unstable the use of fossil fuels has been. Minnesota has turned to using renewable resources to reduce its dependence on fossil fuels. A recent law passed by the governor is pushing the use of wind farms, hydroelectric power, solar energy, and also cleaner-burning fuels. New measures are expected to produce environmental and economic benefits. These energy resources must be cost-effective, domestically available, environmentally superior, and ready to provide power in the next decade. A handful of states have established renewable energy targets, but Minnesota's new law is one of the strongest in the nation by adding between 5,000 to 6,000 Mega Watts (MW) of renewable energy. This study will research the benefits of this law to the State of Minnesota on renewable resources and what laws should be passed.

Greenroofs, An Urban Oasis

Ryan Thompson (Department of Finance)
William Meyer (Department of Management)
Brad Heitzinger (Department of Political Science & Law Enforcement)
Professor Vicki Luoma, Faculty Mentor (Department of Accounting & Business Law)

The term green roof describes an emerging trend in urban cityscapes defining buildings with partially or fully covered roofs in soil and vegetation. While this concept sounds expensive and quite involving the green roof alternative has many options to fit almost any application. The concept of green roofs has been around for years and it gaining popularity in many US cities after the rising number of green roofs in Europe. Benefits including reductions in; building utility costs, green house gas emissions responsible for rising global temperatures, urban heat island effect, and costs associated with replacing roof structures. The benefits of a green roof has been realized by many and has lead to the annual Greening Rooftops for Sustainable Communities Conference, which is scheduled for its fifth meeting April 29, 2007 in Minneapolis, Minnesota. This project will research the concept, construction, advantages, disadvantages, and legal policy changes involving green roofs. The research of this project, in to the various designs, cost benefits and possible legislative policies, is in support of the eventual increase the number of green roofs in the United States.

Mankato's Water: Is It Clearly the Best Choice?

Krista Wassenaar (Department of Civil Engineering)
Chris Kulzer (Department of Accounting & Business Law)
Kevin Wittbrot (Department of Accounting & Business Law)
Professor Vicki Luoma, Faculty Mentor (Department of Accounting & Business Law)

Water is essential to all forms of life. Clean water in particular is essential to human life. Included in this presentation is information regarding the quality and the abundance of the water provide by the City of Mankato. This includes the sources, the water treatment process, the possible contaminants, and the laws and regulations that govern water clarity. Also, improvements to the water quality and the possible processes used will be discussed. This research will include present laws and ordinance in effect and qualitative studies, such as interviews with the parties involved to determine if any other laws or ordinances should be passed.

Tuesday April 24 Presenters

Session 11	8:15-9:45	CSU 203

Biological Sciences and Human Performance

The Effect of Chronic Exercise on Vascular and Kidney Responses in the Spontaneously Hypertensive and WKY Rat
Cassandra M. Borg (Department of Biological Sciences)
Professor Penny Knoblich, Faculty Mentor (Department of Biological Sciences)

Immunolocalization of Actin in Transgenic and Wildtype Murine Myocardium
Megan Bohland, and Jacob T. Davis (Department of Biological Sciences)
Professor Marilyn C. Hart, Faculty Mentor (Department of Biological Sciences)

Offspring Effects of Impaired Aldosterone Secretion during Pregnancy in the Spontaneously Hypertensive Rat (SHR) and the Wistar-Kyoto Rat (WKY)
Erica Moore (Department of Biological Sciences)
Professor Penny Knoblich, Faculty Mentor (Department of Biological Sciences)

Determination of Genetic Diversity of River Otter Populations in Minnesota
Sunnie McCalla (Department of Biological Sciences)
Professors John D. Krenz and Robert E. Sorensen, Faculty Mentors (Department of Biological Sciences)

Evaluation of the Effects of the Allelochemical 5-Hydroxy-1,4-Naphthoquinone on the Invasive Species Rhamnus Cathartica
Genevieve L. Miles (Department of Biological Sciences)
Professor Christopher T. Ruhland, Faculty Mentor (Department of Biological Sciences)

Determination of Aerobic Fitness Requirements for the Popular Video Game "Dance, Dance, Revolution (DDR)"
Michael Steiner (Department of Human Performance)
Professor Mary Visser, Faculty Mentor (Department of Human Performance)

The Effect of Chronic Exercise on Vascular and Kidney Responses in the Spontaneously Hypertensive and WKY Rat

Cassandra M. Borg (Department of Biological Sciences)
Professor Penny Knoblich, Faculty Mentor (Department of 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, from 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 purpose of the study is to examine the effect of exercise on kidney sodium excretion in response to a rise in blood pressure. Thirty male and female SHR rats and thirty male and female WKY rats were 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 4 additional 15-minute periods. Urine will be analyzed for sodium excretion, and data will be compared between sedentary and exercise rats and amongst SHR and WKY strain rats.

Immunolocalization of Actin in Transgenic and Wildtype Murine Myocardium

Jacob T. Davis (Department of Biological Sciences)
Meghan Bohland (Department of Biological Sciences)
Professor Marilyn C. Hart, Faculty Mentor (Department of Biological Sciences)

In myocardium, actin and myosin filaments are organized into repeating units of sarcomeres, the basic unit of muscle contraction. Actin Capping Protien (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, $\beta 1$ and $\beta 2$. The $\beta 1$ isoform is present at the Z line; the $\beta 2$ isoform is found elsewhere including cell-cell junctions. In previous studies, transgenic mice were generated that replaced the $\beta 1$ isoform with the $\beta 2$ isoform using the cardiac-specific promoter, the α-myosin heavy chain (α-MyHC). The promoter is turned on at birth in the ventricles with increased expression as a function of murine age. We hypothesized that a decrease in $\beta 1$ expression will lead to a disorganized myofibrillar structure and that the disorganization will become increasingly severe as a function of murine age. We examined the myocardium of transgenic mice ranging in age from three months to twelve months. Murine hearts were extracted and frozen sections prepared using a cryomicrotome. The tissue sections were fixed, 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. Immunofluorescence studies revealed an increased disorganization of myocardium as a function of murine age, supporting our hypothesis.

Offspring Effects of Impaired Aldosterone Secretion during Pregnancy in the Spontaneously Hypertensive Rat (SHR) and the Wistar-Kyoto Rat (WKY)

Erica Moore (Department of Biological Sciences)
Professor Penny Knoblich, Faculty Mentor (Department of Biological Sciences)

The adrenal gland produces two major hormones, aldosterone and corticosterone. 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 spontaneously hypertensive rat (SHR). Corticosterone, secreted by the second layer of the cortex, has also been deemed necessary in the development of hypertension in the SHR. Studies on the roles of these hormones in hypertension have traditionally focused on complete removal of the adrenal glands, or receptor blocking agents. The removal of one adrenal gland and the freezing of the outer layer of the remaining gland has advantages over these previously used methods. Adrenalectomy, (removal of both adrenal glands), completely eliminates all adrenal hormones. Mineralocorticoid receptor blocking agents, such as spironolactone, are nonspecific, and produce undesirable side effects. The purpose of the present study was to investigate the long term effects of reduced adrenal hormones in the pregnant SHR and WKY on subsequent on offspring. At 8 weeks of age, females underwent 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 5-21 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.

Determination of Genetic Diversity of River Otter Populations in Minnesota

Sunnie McCalla (Department of Biological Sciences)
Professor John D. Krenz, Faculty Mentor (Department of Biological Sciences)
Professor Robert E. Sorensen, Faculty Mentor (Department of 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 on genetic variability, a restriction in the exchange of individuals may subsequently result in reduced population variability. Knowledge regarding the genetic make-up of populations is important in the conservation of biological diversity by allowing 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 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 connected by river systems would exchange individuals more frequently, and thus would be more similar genetically. To collect data, otter tissue was received from trappers. I used DNA sequence data from prior studies in other states to develop a method for genotyping Minnesota otters. I compared genotypes of 185 otters at three loci from the Mississippi River and to the St. Louis River population (which is not connected to the Mississippi River). Genotypic data generated from genotyped otters and conclusions will be presented.

Evaluation of the Effects of the Allelochemical 5-Hydroxy-1,4-Naphthoquinone on the Invasive Species Rhamnus Cathartica

Genevieve L. Miles (Department of Biological Sciences)
Professor Christopher T. Ruhland, Faculty Mentor (Department of Biological Sciences)

Rhamnus cathartica L. (European buckthorn) is an invasive species in North America and a barrier to successful restoration and conservation efforts. Current control measures for this invasive include fire and/or herbicide application and removal by hand. These are work-intensive procedures and, due to the ability of this plant to resprout from stumps, yield only marginal results. Commercial herbicides, while providing an essential service in many managed areas, are often controversial and potentially detrimental to natural processes. Juglone (5-hydroxy-1,4-naphthoquinone) is the oxidized, potentially allelopathic form of a compound that is released from the leaves, fruit and roots of *Juglans nigra* L. (Black walnut). Previous laboratory studies demonstrated the sensitivity and tolerance of a range of species to this compound in hydroponic systems. The purpose of this research was to determine the effects of juglone on *R. cathartica* in a soil system. Juglone was applied to *Glycine max* L. Merr. (soybean) a species that has shown sensitivity to juglone in previous studies, to determine the effectiveness of juglone application to the soil. Potted *R. cathartica* seedlings were then exposed to juglone at three concentrations, 10, 100 and 1000_M, in sterilized soil in a greenhouse. Dark and light adapted yield of photosystem II, net photosynthesis, water potential, growth rate and biomass accumulation were measured for all plants; soils were tested for acidification. Interpretation of the effects of juglone on *R. cathartica* may lead to insight into the control and occurrence of this invasive.

Determination of Aerobic Fitness Requirements for the Popular Video Game "Dance, Dance, Revolution (DDR)"

Michael Steiner (Department of Human Performance)
Professor Mary Visser, Faculty Mentor (Department of Human Performance)

The purpose of this study was to investigate the aerobic fitness of college-aged students while playing the popular video game Dance, Dance, Revolution (DDR). The premise was that this information could allow closer examination of the benefits of using this video game as an exercise tool to target childhood and adolescent obesity. This study included 20 college-aged subjects: 10 male and 10 female. Prior to testing, subjects were given time to become familiar with the equipment and the testing procedures. A non-exercise-based calculation estimated each subject's maximal oxygen consumption, which allowed a fitness classification to be determined. Aerobic capacity was measured continuously using the Medical Graphics metabolic chart, while each subject danced on a solid dance pad, through four progressive stages of DDR. At the end of each stage, the subjects' heart rate (HR) was taken, utilizing a heart rate monitor. Initial examination of results indicated that on average, oxygen consumption and HR increased as the dance became more difficult. In general, exertion in Level 1 was equivalent to walking at 2.5 mph, exertion at Level 2 was equivalent to brisk walking at 3.5 mph, exertion at Level 3 was equivalent to very brisk walking at 4.0 mph, and the exertion of Level 4 was also equivalent to very brisk walking at 4.0 mph. Exertion increased with each level within the ranges suggested for people by exercise professionals to improve their aerobic fitness. Complete data will be presented at the conference.

Tuesday April 24 Presenters

Session 12	10:45-12:30	CSU 202

History

Motivations of the Opponents to the British Contagious Diseases Acts (1866-1886)
Kathryn Pase (Department of History)
Professor Larry Witherell, Faculty Mentor (Department of History)

Dignified Aloofness: Canada's Failed Bid to Join the Pan American Union
Gregory Boubel (Department of History)
Professor Matthew Loayza, Faculty Mentor (Department of History)

The Rise of Benjamin Disraeli and the Passage of the Second Reform Act
Dustin B. Heckman (Department of History)
Professor Larry Witherell, Faculty Mentor (Department of History)

Nineteenth Century Views on Theater and Drama in England
Rebecca Unetic (Department of History)
Professor Larry Witherell, Faculty Mentor (Department of History)

Christian Influence on Roman Law Pertaining To Judaism
Skye A. Dauer (Department of History)
Professor Margaretta Handke, Faculty Mentor (Department of History)

The Effects of British Penal Reform on Juvenile Delinquency, 1895-1900
Abigail A. Tieck (Department of History)
Professor Larry Witherell, Faculty Mentor (Department of History)

A Cause de son Infirmité: Disability at a Girl's Orphanage in Early-Modern Dijon, France
James Gillham (Department of Philosophy)
Professor Christopher Corley, Faculty Mentor (Department of History)

Motivations of the Opponents to the British Contagious Diseases Acts (1866-1886)

Kathryn Pase (Department of History)
Professor Larry Witherell (Department of History)

In 1864 Parliament passed the first Contagious Diseases [CD] Act which allowed authorities in certain ports and military districts to arrest women suspected of prostitution and subject them to testing for venereal diseases. The Act was expanded to include eleven more ports and military garrisons in 1866. With the introduction of the second Act, an opposition emerged and agitated for repeal of the Acts because they felt they were a violation of women's civil liberties. Opponents were eventually effective in getting rid of the Acts in 1886. This paper will demonstrate how the opposition's reasons for campaigning against the Contagious Diseases Acts changed between 1866 and 1886. The research for this project will include the *Parliamentary Debates*, reports from Parliamentary committees, and other parliamentary papers; ninteenth-century British newspapers including the *London Times*; ninteenth-century British periodicals, including the *Shield*; published memoirs, dialiers, and autobiographies by participants, particularly Josephine Butler; and secondary literature, including biographies, monographs, and scholarly journal articles.

Dignified Aloofness: Canada's Failed Bid to Join the Pan American Union

Gregory Boubel (Department of History)
Professor Matthew Loayza, Faculty Mentor (Department of History)

Existing historical scholarship has been critical of the United States' decision to keep Canada out of the Pan American Union in 1941. According to this literature, Canada's failure to join the international organization was a major setback to Canadian-Latin American relations. My research challenges this assertion by investigating the motives behind the Canadian bid for membership. An examination of policy makers' diaries, diplomatic papers, speeches, correspondence, and other key primary sources reveal that Canadian Prime Minister Mackenzie King held little interest in the Pan American Union. Despite overtures from Brazil, Mexico, and even the United States, King resisted establishing formal diplomatic ties with Latin America. My research reveals that staff members within the Canadian Department of External Affairs initiated the attempt at membership without King's full support. The resulting request for membership took the United States by surprise. While it did oppose the move, I have found that the United States' opposition was relatively weak. Yet, because King looked unfavorably upon membership, he accepted the United States' opposition without challenge. I conclude that previous histories have overemphasized the seriousness of United States' objections, while overlooking Prime Minister King's own opposition to membership in the Pan American Union.

The Rise of Benjamin Disraeli and the Passage of the Second Reform Act

Dustin B. Heckman (Department of History)
Professor Larry Witherell, Faculty Mentor (Department of History)

The Reform Act of 1867 expanded the electorate in England by 938,000 people. Conservative Party leader Benjamin Disraeli mastered the passage of the Act following the failure of William Gladstone and the Liberal Party to pass the measure a year earlier. This project will analyze the motives of Disraeli in pursuing this reform despite the lack of full support within his own party, and argue that Disraeli used the passage of this Reform Act of 1867 to enhance his influence and power within the Conservative party and solidify his leadership position. The research will use the parliamentary debates; contemporary newspapers, including the *London Times*; political memoirs, diaries, and autobiographies; contemporary periodicals, such as *Quarterly Review* and *Westminster Review*; and secondary scholarship, both monographs and journal articles.

Nineteenth Century Views on Theater and Drama in England

Rebecca Unetic (Department of History)
Professor Larry Witherell, Faculty Mentor (Department of History)

With the passing of the Licensing Act of 1737 and until its repeal in 1969 the Lord Chamberlain's office has been legally able to censor any drama to be performed at established theatres in England. However, the 1737 Act left inconsistencies in the definition of censorship and the role of censor. People who were involved in theatre believed that the Lord Chamberlain's office gained too much power from the Act. In the nineteenth century, actors, playwrights and members of Parliament agitated for the reform of the 1737 Licensing Act, which led to the establishment of three special parliamentary committees in 1822-1823, 1866 and 1892 as well as to the passage of a second Theatres [Licensing] Act in 1843. This paper will focus on the emerging view of the modern theatre as revealed by the witnesses examined by the special parliamentary committees and in the parliamentary debates. This paper will use the parliamentary debates and parliamentary committee reports; contemporary newspapers, including *The London Times*; contemporary periodicals, including *The Quarterly Review* and *Contemporary Review*; memoirs, diaries and autobiographies of participants and politicians; and secondary historical scholarship including histories of drama and theatre.

Christian Influence on Roman Law Pertaining To Judaism

Skye A. Dauer (Department of History)
Professor Margaretta Handke, Faculty Mentor (Department of History)

In the fourth and fifth centuries C.E. of the Roman Empire it is commonly accepted that a major shift in legal, economic and social status occurred among the religious bodies of the state. These statements usually reflect the idea that as Christianity grew in acceptance and power in the state, the legal rights of its Jewish citizens diminished. This research attempts to identify if there was a direct correlation between the gain of the Christians and the loss of the Jews. I would contend that such changes in the law were actually a reflection of the emperors' Christian beliefs and not a reflection of the growing influence of the early church fathers and while the laws were a response to the growing political Christian influence, they were more likely politically expedient maneuvers than overall anti-Semitism. This research will consider the (1) writings of the early church fathers to determine the degree of influence those writings appear to have made upon the emperors' legislation; (2) biographical information on the emperors reigning from Constantine to Theodosius II to determine the degree of Christian orthodoxy portrayed in their lives; and (3) the language of the *Codex Theodosian*, specifically XVI, Title 8: "Jews, Caelicolists, and Samaritans" and XVI, Title 9: "No Jew shall have a Christian slave", to examine the actual implementation of legislation based upon any correlations found.

The Effects of British Penal Reform on Juvenile Delinquency, 1895-1900

Abigail A. Tieck (Department of History)
Professor Larry Witherell, Faculty Mentor (Department of History)

The British penal reforms of the late nineteenth century served to change the face of both punishment for crime and the nature of crime itself. Reform acts, particularly those dealing with sentencing, corporal punishment, and incarceration had a profound effect on criminality. This project will focus on how these reforms affected the nature of juvenile crime and criminals in Victorian Britain, particularly between 1895 and 1900.

In the mid-nineteenth century, juvenile delinquency was fairly common social situation. It was commonplace in London society especially, where bands of young pickpockets and beggars would comb the city streets causing trouble. The archaic prison system was not well-equipped to deal with the load of criminals heaped upon it. Jails were overcrowded and often served as breeding-grounds for organized crime. Sentencing of criminals was also problematic, as sentences often did not accurately reflect the gravity of a crime. By the 1870s, legislators were growing anxious about the growing number of criminals, especially in the large cities, and the lack of means to deal with them.

This project will look at how these reforms changed the face of juvenile delinquency in Britain between the years of 1895 and 1900, and utilize statistical evidence from parliamentary papers; Parliamentary debates; contemporary newspapers and periodicals; and secondary scholarship.

A Cause de son Infirmité: Disability at a Girl's Orphanage in Early-Modern Dijon, France

James Gillham (Department of Philosophy)
Professor Christopher Corley, Faculty Mentor (Department of History)

Historians have traditionally studied the role of the orphanage within the economic and social framework of towns and cities. Scholars have shown the important role the orphanage played by caring for orphaned and abandoned children, but studies that look beyond the institutional history of the orphanage and examine the lives of the orphans themselves are a relatively new addition to scholarly work in the field.
My research examined and compared the registry entries of the St. Anne's orphanage in Dijon, France between 1770 and 1775. Examination of the registry entries gave an indication of the social function and contributions of the orphanage and provided information on patterns of social welfare and charity, the effects of death and illness on poor families, and the treatment of ill and disabled children. Along with supporting the work of historians studying the lives of orphans during this time, my research found a significant percentage of females admitted to the orphanage as a result of disability. Historians have largely neglected the history of disability, and my findings contribute to the emerging scholarly discussion of disability history while complicating the historical perspectives on the cultural and economic reasons for child abandonment in eighteenth-century Europe.

Tuesday April 24 Presenters

Session 13 | 10:30-12:30 | CSU 204

Women's Studies

An Analysis of Recovery from Abuse in Two Women's Autobiographies
Ashley Angerhofer (Department of Women's Studies)
Professor Jocelyn Fenton Stitt, Faculty Mentor, (Department of Women's Studies)

Girls Gone Wild: Porn or Pop Culture?
Kelly Trytten (Department of Women's Studies)
Professor Jocelyn Fenton Stitt, Faculty Mentor (Department of Women's Studies)

Listen, Can You Hear Their Voices?: Analysis of the Representation of Women in the St. James (Minnesota) High School Curriculum
Sharon Dexheimer (Department of Women's Studies)
Professor Jocelyn Fenton Stitt, Faculty Mentor (Department of Women's Studies)

Christian Feminism: Female Pastors and Feminism
Amanda A. Slowinski (Department of Women's Studies)
Professor Jocelyn Fenton Stitt, Faculty Mentor (Department of Women's Studies)

Porn and Feminism in a New Light
Elizabeth Cody (Department of Women Studies)
Professor Jocelyn Fenton Stitt, Faculty Mentor (Department of Women Studies)

Reassessing *Pornography and Silence* by Susan Griffin, Feminist Critiques 25 Years Later
Nicole Meyers (Department of Women's Studies)
Professor Jocelyn Fenton Stitt, Faculty Mentor (Department of Women's Studies)

Junior High Reading Choices and School Librarian Influences on Those Choices
Sarah Turbes (Department of Women's Studies)
Professor Jocelyn Fenton Stitt, Faculty Mentor (Department of Women's Studies)

An Analysis of Recovery from Abuse in Two Women's Autobiographies

Ashley Angerhofer (Department of Women's Studies)
Professor Jocelyn Fenton Stitt, Faculty Mentor, (Department of Women's Studies)

The project uses the methodology of content analysis to examine two autobiographies: "The Doghouse Angel: From The Darkness of Abuse to the Light of Healing" by Kimberly A. Steward and "Heal and Forgive" by Nancy Richards. Both autobiographies reflect women's recovery process. It is important to examine the recovery process of abuse to understand how people can help others who have survived abuse without causing more harm. Domestic violence has become an enormous issue. It is important for society to help other women not feel they are to blame for the abuse.

Girls Gone Wild: Porn or Pop Culture?

Kelly Trytten (Department of Women's Studies)
Professor Jocelyn Fenton Stitt, Faculty Mentor (Department of Women's Studies)

Since its creation in 1997, Mantra Films Inc. has become most popular for its film series "Girls Gone Wild." Citing exponential brand growth each year since 1997, Mantra Films Inc. productions flirt with the line between popular culture and soft core pornography. Bodies of knowledge consulted include feminist definitions of pornography, history and analysis of film and filmmaking, and general contexts of modern popular culture, especially as it relates to girls' so-called empowerment through exhibitionism. Data was gathered by means of visual content analysis of actual "Girls Gone Wild" films. Films were viewed in their entirety before being subjected to coding for analysis. Results indicate that the "Girls Gone Wild" films are in fact pornography. Further analysis indicates that these films are successful due to being made within the context of a society which embraces pornography into its popular culture. From these results connections were made on how this study relates to feminist study of pornography and popular culture.

Listen, Can You Hear Their Voices?: Analysis of the Representation of Women in the St. James (Minnesota) High School Curriculum

Sharon Dexheimer (Department of Women's Studies)
Professor Jocelyn Fenton Stitt, Faculty Mentor (Department of Women's Studies)

Current state legislation does not specifically mandate the teaching of women's history in high school curriculum. The Minnesota Department of Education allows for each school district to develop its own curriculum and thus the standards are written at a more general level. To discern student awareness of the representation of women, 9-12 graders at St. James High School were asked about famous women in five areas: sports, history, arts, science/math and literature. The students were also asked about their interests in the same five areas as elective course offerings. Teachers of grades 9-12 were asked about current curriculum and the inclusion of women's contributions. Teachers were also asked about their interest in teaching the same five courses listed on the student survey. Additionally, an interview was conducted with the high school principal who is responsible for curriculum development. This study's research indicated there is an interest, both by students and staff, to supplement or develop new materials to increase the representation of women in the present high school curriculum.

Christian Feminism: Female Pastors and Feminism

Amanda A. Slowinski (Department of Women's Studies)
Professor Jocelyn Fenton Stitt, Faculty Mentor (Department of Women's Studies)

Christian Feminism is a branch of Feminism that combines Christian beliefs with Feminist theory. Using the methodology of oral history I interviewed two female pastors in southern Minnesota. I wanted to know how they dealt with issues such as church leadership, women's place in the church, abortion, sexist behavior, sexuality, gender roles, the gender of God, and inclusive language while being a pastor. I also investigated why the two women I spoke with either chose to identify as a Feminist or not. I analyzed the interviews using theoretical perspectives from Christian Feminist, Feminist and religious texts to show the relationship between Christianity and Feminism, as well as why one would or would not identify with Christian Feminism while being a pastor. While this oral history project does not attempt to reflect the views of all Feminist Christian women, the purpose of my research was to obtain a fuller understanding of Christian Feminism through in-depth research on the experiences of two women pastors.

Porn and Feminism in a New Light

Elizabeth Cody (Department of Women Studies)
Professor Jocelyn Stitt, Faculty Mentor (Department of Women Studies)

All parts of culture affect women and feminism. Therefore pornography affects feminism. This study worked to understand in what ways porn effects feminism. Further, how has feminism affected the pornographic industry? To understand feminism and the porn industry there are many readings including older articles that deal with the rise of pornography in the Women's Liberation Movement, texts like *Sexual Revolution* contain older writings and new anecdotal books like *Naked Ambition: Women Who Are Changing Pornography* and articles dealing exclusively with this issue. This project surveyed existing feminist writings about pornography in an attempt to answer that unanswerable question of whether or not pornography hurts women. I attempted to take a frank look at how they interact with each other and change for the better or worse. There is an old idea of how pornography hurts women while others believe in free speech and that women make their own decisions on pornography. Over time feminists have formed different ideas on pornography, but the old negative idea has stuck. A way to change that is to look at the old and new writings on the subject as a way to form a new opinion. The research involved for this project is a way for feminists of today to form a new opinion that is neither old or new.

Reassessing *Pornography and Silence* by Susan Griffin, Feminist Critiques 25 Years Later

Nicole Meyers (Department of Women's Studies)
Professor Jocelyn Fenton Stitt, Faculty Mentor (Department of Women's Studies)

Susan Griffin's book titled *Pornography and Silence: Culture's Revenge Against Nature* was published in 1981. This book studied how pornography was a problem for many women during this time period. Susan Griffin studied different types of pornography in this book including pornographic books, X-rated movies and magazines. Griffin also touched on sadomasochism and how it had become somewhat of an epidemic in our society. Griffin believed that the images found in pornography are inhumane and unfair to women. The ideas in Susan Griffin's book will be studied and compared to several current feminist views of pornography. How have feminist views of pornography changed over the course of 25 years using Susan Griffin's book as a view from the past? Do feminists today still believe that sadomasochism is a problem in our society? Do they still believe that pornography is inhumane and unfair to women? Are there feminist writers today that take the same stance on pornography as Susan Griffin? *Naked Ambition* by Carly Milne (2005) is an example of a book that takes an opposite stance on pornography as Susan Griffin. The author of this book believes that women today are changing pornography and becoming more in control of the business and declaring their sexuality publicly. Carly Milne doesn't believe that women are silenced in pornography but that they are empowered by it. Through examining feminist responses to pornography in these two time periods I will identify areas that have changed and areas that have stayed the same.

Junior High Reading Choices and School Librarian Influences on Those Choices

Sarah Turbes (Department of Women's Studies)
Professor Jocelyn Fenton Stitt, Faculty Mentor (Department of Women's Studies)

It is often assumed that adolescent girls and boys, specifically in junior high, either show a strong interest in reading or have little to no interest. After exploring some "best seller" lists regarding junior high literature, I made an assessment that students who choose to read unassigned literature or "leisure reads" often pick books which reflect the topics which are related to their gender. For example, on a list entitled "13 Year Old Essentials!," the book selection was clearly targeted towards young girls, with titles like "Princess Diaries." While students are not being assigned such books within the classroom, the library is a place where students have easy access to a wide assortment of novels. After making an assessment of popular novels read by junior high students, I was interested to see if librarians influenced students' reading choices through verbal suggestions or through the selection of novels that they ordered for the library. I was also interested in finding out if these influences were consciously or unconsciously gendered. In my search to answer these questions, I surveyed a group of surrounding area librarians in junior highs as well as librarians in charge of the young adult section of the public libraries. With the information I gathered from the surveys, in addition to some research within academic journals, I was able to answer the question of to what degree young readers were influenced by librarians, and how the literature that they chose to read portrayed gender issues.

Tuesday April 24 Presenters

Poster Session C | **10:00-12:00** | **CSU 253/4/5**

Characterization of Proteins that Interact with the Alpha Subunit of Actin Capping Protein
Joshua Kamrud and Ryan Raver (Department of Biological Sciences)
Professor Marilyn Hart, Faculty Mentor (Department of Biological Sciences)

The Effect of Chronic Exercise on Vascular and Kidney Responses in the Wistar-Kyoto Rat
Olivah E. Msambichaka and Jessica K. Nelson (Department of Biological Science)
Professor Penny Knoblich, Faculty Mentor (Department of Biological Science)

Effects of Surgically Induced Low Aldosterone Levels on Growth and Cardiovascular Development in WKY Rats
Lauren Haverstock (Department of Biological Sciences)
Professor Penny Knoblich, Faculty Mentor (Department of Biological Sciences)

Microscopic Imaging of Aquatic Invertebrates in Southern Minnesota
Omary Lyimo and Tracy McConnell (Department of Biological Sciences)
Professors Michael Bentley and Bertha Proctor, Faculty Mentors (Department of Biological Sciences)

Analysis of Soil Microbial Communities in Young and Old Vascular Plants Ecosystems on the Antarctic Peninsula
Tammy Kolander (Department of Biological Sciences)
Professors Christopher Ruhland and Timothy Secott, Faculty Mentors (Department of Biological Sciences)

Attempting the Impossible: the Quantification of Pain
Mary Pyka (Department of Biological Sciences)
Professor Dawn Albertson, Faculty Mentor (Department of Psychology)

Distribution of Macroinvertebrate Populations Between Side-by-Side Drainage Basins with One Being a Channelized Judicial Ditch and the Other a More Meandering Stream
Tom Burg and Lynn Schultz (Department of Biological Sciences)
Professor Bertha Proctor, Faculty Mentor (Department of Biological Sciences)

The Morphological Changes in the Intestine of the Earthworm (Eisenia Foetida) after Treatment of Antibiotics
Emma Boyce and Alicia Brueske (Department of Biological Sciences)
Professor Michael Bentley, Faculty Mentor (Department of Biological Sciences)

Comparison of Effects of Corn Gluten and Distillers Grain on the Germination of Lettuce and Green Bean Seeds
Christine Stocker (Department of Biological Sciences)
Professor Beth Proctor, Faculty Mentor (Department of Biological Sciences)

Allelopathic Effects of Water Extracts of Roots from *Typha Angustifolia* and *Scirpus Flaviatilis* Stored in a Refrigerator 60-90 Days (Simulated Winter) on Seeds of *Lactuca Sativa*
Nate Schipper (Department of Biological Sciences)
Professor Beth Proctor, Faculty Mentor (Department of Biological Sciences)

Characterization of Proteins that Interact with the Alpha Subunit of Actin Capping Protein

Ryan Raver (Department of Biological Sciences)
Joshua Kamrud (Department of Biological Sciences)
Professor Marilyn Hart, Faculty Mentor (Department of Biological Sciences)

Actin plays a key role in cell structure, shape, size, and motility. Actin is regulated by a variety of accessory proteins including actin capping protein (CP). CP is a heterodimer composed of an alpha (α) and beta (β) subunit. Lower organisms have one isoform of both the α and β subunit. In contrast, in higher organisms, three α and three β subunit isoforms have been identified. We hypothesize that the three α isoforms have unique cellular and biochemical roles and therefore interact with different cellular proteins. In a previous study, a yeast two hybrid screen was employed using a murine embryonic cDNA library as prey and either α1 or α2 as bait to identify protein interactions between α1 and α2 and other structural or regulatory proteins. The α1 screen identified five interacting clones and the α2 screen identified seven interacting clones. Sequence analysis confirmed the identity of four of the α2 clones as actin, myosin heavy chain 3, serine proteinase inhibitor, and a novel gene on Musculus chromosome 1. The purpose of our research is to characterize the remaining clones. We have isolated total DNA, including genomic and plasmid, from yeast cells and confirmed the integrity of the DNA. The plasmid inserts were amplified via the Polymerase Chain Reaction using vector specific primers to determine insert size. PCR products were sequenced. Preliminary data will be presented.

The Effect of Chronic Exercise on Vascular and Kidney Responses in the Wistar-Kyoto Rat

Jessica K. Nelson (Department of Biological Science)
Olivah E. Msambichaka (Department of Biological Science)
Professor Penny Knoblich, Faculty Mentor (Department of Biological Science)

One of the leading causes of cardiovascular disease is hypertension. Failure of the kidney to remove excess sodium and water from the body as blood pressure rises can result in hypertension. Regular exercise has been proven to reduce blood pressure in both humans and rats. In addition, exercise has been shown to reduce the development of atherosclerotic plaques, body weight, resting heart rate, and alter hormone levels towards normal homeostasis levels. Previous research has not examined the effect of exercise on kidney sodium excretion in response to hypertension. The current study involved a total of forty Wistar-Kyoto (WKY) rats, twenty males and twenty females, which were randomly placed into either exercise or sedentary groups. The exercise group was provided a running wheel from weaning to 12-14 weeks of age. The sedentary group had no exercise. At 12-14 weeks of age the rats were anesthetized (Inactin, 100 mg/ kg). A breathing tube was surgically placed into the trachea, and catheters were placed into the carotid artery (to monitor blood pressure and heart rate) and jugular vein (for infuse of saline to maintain fluid balance). A collecting tube was inserted into the bladder for urine collection. After a 15 minute baseline period, which included a urine collection, blood pressure was artificially raised by tying off the celiac, mesenteric, and lower abdominal aorta. Blood pressure was monitored, and urine was collected for four additional 15-minute intervals. The sodium and potassium excretion in the urine were analyzed and compared between the two groups of rats.

Effects of Surgically Induced Low Aldosterone Levels on Growth and Cardiovascular Development in WKY Rats

Lauren Haverstock (Department of Biological Sciences)
Professor Penny Knoblich, Faculty Mentor (Department of Biological Sciences)

This research investigated the role of the hormone aldosterone on the growth, heart rate and blood pressures of normotensive Wistar-Kyoto (WKY) rats. Aldosterone is secreted by the outermost layer of the adrenal cortex, and acts on the kidney to increase sodium retention. When more sodium is retained, the kidneys retain more water and this increases blood volume and blood pressure. Twenty male and twenty female WKY rats were subjected to either the experimental or sham procedure. In the experimental procedure, the outer adrenal cortex of one adrenal gland was frozen, while the other adrenal gland was removed. The sham procedure used identical surgical approaches, but the adrenal glands were untouched. After a ten day recovery period, data collections were completed every other week. The weights, heart rates and systolic blood pressures were recorded for each rat, until 21 weeks of age.

Microscopic Imaging of Aquatic Invertebrates in Southern Minnesota

Tracy McConnell (Department of Biological Sciences)
Omary Lyimo (Department of Biological Sciences)
Professor Michael Bentley, Faculty Mentor (Department of Biological Sciences)
Professor Bertha Proctor, Faculty Mentor (Department of Biological Sciences)

The watershed of southern Minnesota contains a variety of invertebrate species, some common and some endanger. It is important to identify these species, because their diversity could play a role in ecological stability and aid in the identification of changes in our environment. The purpose of this study was to begin a photographic catalog of invertebrates in the watershed. A dissecting light microscope was used to take initial micrographs of the organisms and their anatomy. The organisms were then identified. Smaller species were critical point dried, sputter coated, and viewed using scanning electron microscopy. With the aid of light and scanning electron microscopy, these invertebrates were identified and cataloged, which will provide a basis for future research.

Analysis of Soil Microbial Communities in Young and Old Vascular Plants Ecosystems on the Antarctic Peninsula

Tammy Kolander (Department of Biological Sciences)
Professor Christopher Ruhland, Faculty Mentor (Department of Biological Sciences)
Professor Timothy Secott, Faculty Mentor (Department of Biological Sciences)

The average temperature on the Antarctic Peninsula has risen > 2.9°C over the past 50 years. This has caused a number of glaciers to recede, leaving behind newly exposed soil with minute amounts of organic matter. This creates an ideal location for a microbial successional study. We sought to investigate microbial community succession and its fundamental variations due to environmental dissimilarities by comparing microbial activity in newly exposed soil (Point 8, exposed < 20 years) with that of a well-developed soil (Stepping Stones, exposed > 500 years). Community-level carbon substrate utilization (CLSU) was used to analyze carbon catabolic activity of a transect extending out from the glacier face, as well as on Stepping Stones. Differential nucleic acid staining was used to determine the number of culturable and non-culturable bacteria. Standard plate counts were obtained to enumerate culturable organisms in the soil. Numerous morphologically distinct fungi and bacteria were isolated from cultures. CLSU patterns indicated distinctly different microbial community compositions along the Point 8 transect. A fourth distinct community was identified based on CLSU patterns from Stepping Stones. Plate counts from early successional communities revealed a bacterial component that was culturable only at low dilutions, possibly suggesting competitive inhibition. The fungal presence was unexpectedly high in the newly exposed soil, particularly when considering its alkaline pH and very low level of organic material. Our results provide a baseline for the study of microbial succession in the context of climate change.

Attempting the Impossible: the Quantification of Pain

Mary Pyka (Department of Biological Sciences)
Professor Dawn Albertson, Faculty Mentor (Department of Psychology)

In the practice of medicine, many doctors and nurses rely on the Wong-Baker Face Pain Rating Scale to determine a patient's level of pain. Consequently, this pain scale is subjective in that it relies only on a patient's self report. Therefore, there is a need for the development of an objective measurement of pain. This exploratory study attempted to quantify ProstaglandinE2 (PGE2) in a rat model, in response to pain. PGE2 is secreted upon cellular injury and therefore acts as a messenger of pain. Uric acid crystals were injected into the intracapsular space of a randomly selected hind limb to induce joint pain. An Enzyme-Linked ImmunoSorbent Assay kit (ELISA) was used to chart the time course of alterations in PGE2 levels. In addition, an analysis of the rat's behavior in response to pain was obtained and correlated with the alterations of PGE2. This study represents the first in a series that will be combined to create an objective pain scale. The results from the study will be presented.

Distribution of Macroinvertebrate Populations Between Side-by-Side Drainage Basins with One Being a Channelized Judicial Ditch and the Other a More Meandering Stream

Tom Burg (Department of Biological Sciences)
Lynn Schultz (Department of Biological Sciences)
Professor Bertha Proctor, Faculty Mentor (Department of Biological Sciences)

The purpose of our research was to determine if there were differences in the number and type of benthic macroinvertebrates (organisms without backbones that live in water and can be seen with the naked eye) in a channelized ditch (Judicial Ditch 1) and relatively undisturbed, meandering stream (headwaters of Rice Creek). The two test watersheds are side-by-side and have similar land use. Sampling locations were less than 1/4 mile from each other. Artificial substrates (Hester-Dendy and Brick-Scrubby) were placed at each sampling site. The substrates were collected after 5 weeks of colonization between June-July 2007. When the artificial substrates were retrieved, macroinvertebrates were collected using the time picked method. We will present the similarities and differences between the type of macroinverterates found at the two locations and the Family Biotic Index calculated for each site. We will also discuss the implication our results on the impacts of channelization (ditch) and meander stream on macroinvertebrate composition.

The Morphological Changes in the Intestine of the Earthworm (Eisenia Foetida) after Treatment of Antibiotics

Alicia Brueske (Department of Biological Sciences)
Emma Boyce (Department of Biological Sciences)
Professor Michael Bentley, Faculty Mentor (Department of Biological Sciences)

Earthworms thrive in a microbial rich environment. However, the nature of the defense microbial mechanisms in regards to the intestinal tract is poorly understood. The purpose of this study is to determine whether the morphology of the digestive tract is altered with the presence or absence of bacteria. The digestive tracts of six normal earthworms were compared to the digestive tract of six worms treated with antibiotics (penicillin, streptomycin, and actinomycin D). Each worm was anesthetized with 5% ethanol and then cut into nine segments. The intestine was isolated from each segment and fixed in 3% glutaraldehyde and post fixed in osmium tetroxide. The tissues were then dehydrated in graded acetone solutions, critical point, and sputter coated with gold and palladium for examination with the scanning electron microscope. Epithelial cells tapered to basal processes which appeared to fit into socket-like depressions in the basal lamina. Also, a brush border of microvilli was seen and continued with highly ridged lateral epithelial cell surface; currently, no clear-cut distinctions have been observed between the antibiotic-treated and normal earthworms. These results indicate that there are differences in size and appearance of antibiotic-treated and normal earthworms, the intestinal tracts appear similar.

Comparison of Effects of Corn Gluten and Distillers Grain on the Germination of Lettuce and Green Bean Seeds

Christine Stocker (Department of Biological Sciences)
Professor Beth Proctor, Faculty Mentor (Department of Biological Sciences)

Corn Gluten is a byproduct of the manufacture of corn syrup and corn starch. Since 1999 it has been used as an organic herbicide that prevents germination of weeds. Production of ethanol from corn is an expanding business in the upper mid west. A byproduct of ethanol production from corn is distiller's grain. The purpose of our research was to determine if distiller's grain and corn gluten would reduce germination and growth of lettuce and green beans. In the spring of 2006 lettuce and green beans seeds were planted in flats and placed in the green house. Three flats planted with beans (42 bean seeds/flat) and three flats planted with lettuce (200 lettuce seeds/flat) were treated with corn gluten at the recommended application rate of 20 pounds/ 1000 ft 2 (or 0.063 grams/ in2). Three flats of beans and lettuce were also treated with distiller's grain at the same rate of application as corn gluten and three flats of beans and lettuce were controls (untreated). The number of seeds that germinated was recorded daily for two weeks. Plants were watered as needed. We will discuss the results of our study .

Allelopathic Effects of Water Extracts of Roots from *Typha Angustifolia* and *Scirpus Flaviatilis* Stored in a Refrigerator 60-90 Days (Simulated Winter) on Seeds of *Lactuca Sativa*

Nate Schipper (Department of Biological Sciences)
Professor Beth Proctor, Faculty Mentor (Department of Biological Sciences)

Allelopathy is defined as the suppression of growth of one plant species by another due to the release of toxic substances (Webster's dictionary). *Typha angustifolia* (narrow leaf cattail) and *Scirpus fluviatilis* (river bulrush) plants were grown both alone (cattail (CT) alone, bulrush (BR) alone) and together (CTCT, CTBR, BRBR) to mimic natural environmental settings to determine if either plant species produced allelochemicals when grown alone or in the presence of a competitor. *Lactuca sativa* (lettuce) has been shown to be sensitive to allelochemicals (Bonasera1979) and is a rapid germinator. Therefore, lettuce seeds give quick results and provide a good model for determining inhibitory allelopathic effects. Seeds of *L. sativa* were exposed to aqueous extracts of the roots of *T. angustifolia* and *S. fluviatilis* harvested after 100 days from plants grown under the afore mentioned conditions and refrigerated (simulate winter) for 60-90 days. We recorded the number of seeds that germinated over 7 days and on day seven determined the length of each lettuce sprout. We also took photographs to document plant health and used controls (seeds treated with water only). We will present the results of this preliminary study.

Tuesday April 24 Presenters

Poster Session D | **10:00-12:00** | **CSU 253/4/5**

Articulation in Conversation: A Comparison of Children with Williams Syndrome and Their Typically Developing Peers
Rachel Dahl, Laura Johnson, Jada Jokumsen, and Amy Weiss (Department of Speech, Hearing & Rehabilitation Services)
Professor Patricia Hargrove, Faculty Mentor (Department of Speech, Hearing & Rehabilitation Services)

Selected Language Skills of an Individual with Asperger's Syndrome: A Qualitative Case Study
Elizabeth Briggs (Department of Communication Disorders).
Professor Bonnie Lund, Faculty Mentor (Department of Communication Disorders)

Selected Language Skills of a Child with a Hearing Impairment
Carissa Coons (Department of Communication Disorders)
Professor Bonnie Lund, Faculty Mentor (Department of Communication Disorders)

Effects of implicit vs. explicit encoding instructions for a recall task of Brain Structures.
Tom Bomberg and Nathan Gilow (Department of Psychology)
Professor Robert Widner (Department of Psychology)

Team Cohesion and Performance as a Product of Virtual Condition
Melissa Vale (Department of Psychology)
Professor Andrea Lassiter, Faculty Mentor (Department of Psychology)

Training and Learning Preferences of Older Workers
Katie Fairchild (Department of Psychology)
Professor Andrea Lassiter, Faculty Mentor (Department of Psychology)

Changes in Attitudes Towards the Situation or Changes in Attitudes Towards the Self? The Role of Cognitive Dissonance in Adjusting to Unpleasant Work Environments for Independent and Interdependent Selves
Daniel Ellis (Department of Psychology)
Yun-Mi Choi, Graduate Researcher, (Department of Psychology)
Professor Vinai Norasakkunkit, Faculty Mentor (Department of Psychology)

Examining Need for Cognition and Feedback with Team Virtuality
Adam Roybal and Alison Rusk (Department of Psychology)
Professor Andrea Lassiter, Faculty Mentor (Department of Psychology)

Normative Study for Soft Phonation Index
Megan Riesgaard (Department of Communication Disorders)
Professor Bruce Poburka, Faculty Mentor (Department of Communication Disorders)

Creative Exploration of Alternative Photographic Process
Laura Klecker (Department of Art Education)
Professor Gina Wenger, Faculty Mentor (Department of Art)

Articulation in Conversation: A Comparison of Children with Williams Syndrome and Their Typically Developing Peers

Amy Weiss (Department of Speech, Hearing, and Rehabilitation Services)
Rachel Dahl (Department of Speech, Hearing, and Rehabilitation Services)
Jada Jokumsen (Department of Speech, Hearing, and Rehabilitation Services)
Laura Johnson (Department of Speech, Hearing, and Rehabilitation Services)
Professor Patricia Hargrove, Faculty Mentor (Department of Speech, Hearing, and Rehabilitation Services)

This project investigated articulation skills in spontaneous speech of individuals with Williams syndrome. Williams syndrome is a chromosomally based developmental disability. There are reports that articulation and phonological skills are surprisingly good in individuals with Williams syndrome. On the basis of these largely anecdotal reports, we predicted that individuals with Williams syndrome would be more articulate than their peers.

The purpose of this research was to compare the articulation skills of individuals with Williams syndrome to their typically developing peers. Ten participants, five with Williams syndrome and five typically developing peers, talked with a graduate clinician on a topic of their interest. The conversations were analyzed for percent consonants correct.

The results revealed individuals with Williams did not have significantly higher percentages of consonants correct than their typically developing peers. The finding will be discussed in light of the commonly held impressions about Williams syndrome.

Selected Language Skills of an Individual with Asperger's Syndrome: A Qualitative Case Study

Elizabeth Briggs (Department of Communication Disorders).
Professor Bonnie Lund, Faculty Mentor (Department of Communication Disorders)

The purpose of this research was to learn about the selected language skills of individuals with AS through qualitative inquiry. IRB approval was obtained to proceed with the research. A qualitative research method was employed to obtain information from a mother with a son who has Asperger's Syndrome (AS), by means of interview. I also used resources such as books and the internet to assist my study. General information found in books and online, pertaining to AS was included in the literature review. Codes were used to organize information taken from the interview and patterns of family dynamics associated with AS were identified, resulting in assertions about this family's experience.

Selected Language Skills of a Child with a Hearing Impairment

Carissa Coons (Communication Disorders)
Professor Bonnie Lund, Faculty Mentor (Communication Disorders)

Through qualitative research I took an in depth look at a toddler with a hearing impairment. Using mother and grandmother interviews and a review of audiological documents obtained from the mother, I was able to get a thorough look at the specific language skills of this child. Throughout my research, I also investigated the experiences this particular family had with having a child with a hearing impairment. Information obtained during the research was organized and analyzed for different patterns. Assertions were made about the family's experiences.

Effects of implicit vs. explicit encoding instructions for a recall task of Brain Structures.

Tom Bomberg (Department of Psychology)
Nathan Gilow (Department of Psychology)
Professor Robert Widner (Department of Psychology)

Most everyone has had the experience of a song triggering a memory of someone from their past. Such experiences, where events in the environment cue a past experience, feeling, or thought, have been cited as examples of encoding specificity. We are more likely to recall a target or desired response, if the environmental cues present at the time of study are also present at the time of test (e.g, Tulving & Thompson, 1966). Higham (2002) concluded "cued recall performance is determined by three processes: retrieval, monitoring effectiveness (i.e., the ability to discriminate correct from incorrect products of retrieval) and report bias (i.e., willingness to report an answer)". We examined the effects of instructions on encoding specificity. Participants were either informed (or not) about a subsequent memory test and were aware (or not) of learning the material. Half of the participants were tested in the same context as study and half were tested in a different context. We outline the conditions under which memory performance is optimal and discuss the implications for learning.

Team Cohesion and Performance as a Product of Virtual Condition

Melissa Vale (Department of Psychology)
Professor Andrea Lassiter, Faculty Mentor (Department of Psychology)

Dispersed teams connected by computer media are becoming a more important issue in organizations and academic settings. Recently, there has been an increase in the need for teams to work together to perform important tasks even though they may never actually meet face-to-face or may not be in the same location. As part of a larger study, this particular research examined the roles of task cohesion and social cohesion as they influence trust and performance effectiveness in virtual teams. This lab experiment used three different conditions in which groups were either face-to-face throughout the entire session; met first face-to-face and then were separated to work together; or were completely separated and never saw each other during the session. The experiment was concerned with the effects that these conditions would have on virtual group effectiveness. It was expected that 1) face-to-face groups would have the highest levels of cohesion; and 2) task cohesion would have higher effects on performance than social cohesion. Results of these research questions will be presented. In addition we will provide recommendations for future research examining cohesion, trust, and other psychological factors along with their influence on virtual team effectiveness.

Training and Learning Preferences of Older Workers

Katie Fairchild (Department of Psychology)
Professor Andrea Lassiter, Faculty Mentor (Department of Psychology)

Organizations are facing a growing problem of an impending workforce shortage which is expected to be caused by large numbers of retiring baby boomers. To deal with the situation, companies will need to find ways to retain and accommodate older workers. Considering this, researchers and practitioners need to better understand issues facing older adults in the workplace. The purpose of this research was to understand training issues facing older workers and their training preferences for workplace learning. Survey questionnaires were administered to employed adults over age 55. Survey items included an assessment of preferred learning styles, a training preferences inventory, and demographic information. Over 60 respondents completed these measures. Result will help organizations in terms of performance management and human resource processes. More specifically, by understanding what older workers prefer, organizations can design training programs that are best-suited for this population, which could increase retention for this segment of the workforce.

Changes in Attitudes Towards the Situation or Changes in Attitudes Towards the Self? The Role of Cognitive Dissonance in Adjusting to Unpleasant Work Environments for Independent and Interdependent Selves

Daniel Ellis (Department of Psychology)
Yun-Mi Choi, Graduate Researcher, (Department of Psychology)
Professor Vinai Norasakkunkit, Faculty Mentor (Department of Psychology)

Research suggests that individuals can derive satisfaction from making certain choices for themselves. When an individual chooses a behavior or role that turns out to be unsatisfactory, the individual may experience dissonance which negatively affects the individual's sense of self-consistency, integrity, and self-esteem. Cognitive dissonance theory predicts that when an individual is indefinitely stuck in such an unpleasant situation, such as an unsatisfying work environment (e.g. disputes with supervisor or peers, job does not fulfill expectations, etc.), the individual will experience dissonance. In order to relieve this dissonance, individuals try to remove themselves from the unpleasant work environment, or, when unable to escape, may change their attitude regarding the work environment by focusing on positive aspects of the environment (e.g. pay, friendly co-workers, desirable hours, etc.). However, changing one's attitude towards the environment is only one strategy towards relieving dissonance. An alternate strategy would be to change one's attitude towards one's self ("I must become more patient," "I will pay more attention to detail," etc.), thus becoming accepting and accommodating towards the reality of the unpleasant environment. Cognitive dissonance theory correctly predicts that independent selves will change their attitude toward the environment to alleviate dissonance. This research, using data collected from participants in the U.S. and South Korea, proposes that interdependent selves rely on the alternative strategy of changing their attitudes towards the self when confronted with dissonance. By measuring the individuals' self-construal and dissonance relieving strategies, we intend to show that dissonance strategies are dependent upon the self-construal of the individual.

Examining Need for Cognition and Feedback with Team Virtuality

Alison Rusk (Department of Psychology)
Adam Roybal (Department of Psychology)
Professor Andrea Lassiter, Faculty Mentor (Department of Psychology)

In response to an increase in global operations and the use of computers in the workplace, there has been an expansion of research on dispersed or virtual groups. These are groups that use computers to mediate communication between members (e.g., Kozlowski & Bell, 2003). One area relevant to virtual team effectiveness where there is little existing research is in feedback. The purpose of this research was to examine differences in virtual team effectiveness as it is influenced by performance feedback delivered as an after event review (AER). Additionally, this study examined the role of need for cognition as an individual difference contributing to the relationship between feedback and virtual team performance effectiveness. In virtual team performance environments it is expected that in response to feedback, individuals scoring high in need for cognition will outperform individuals scoring lower in need for cognition. This research presents background information about need for cognition and feedback. In addition, we will present a proposed method for assessing these variables in a lab-based research study.

Normative Study for Soft Phonation Index

Megan Riesgaard (Department of Communication Disorders)
Professor Bruce Poburka, Faculty Mentor (Department of Communication Disorders)

Soft Phonation Index (SPI) is an acoustic analysis parameter contained in the Multidimensional Voice Program (MDVP). It was designed to provide an objective index relating to glottal closure. To date, normative data for SPI have not been reported in the literature. This study was undertaken to establish normative data on adult male and female speakers for SPI. Descriptive statistics including mean, standard deviation, and range are provided.

Creative Exploration of Alternative Photographic Process

Laura Klecker (Department of Art Education)
Professor Gina Wenger, Faculty Mentor (Department of Art)

Photography is often thought of as traditional black and white darkroom techniques or digital imaging. In this study three alternative photographic processes were explored: pinhole photography, the Vandyke printing process, and the manipulation of Polaroid transfers. Unlike conventional photography, these works were created using unique picture taking techniques, altered in various ways after the photograph had been taken, and printed on special chemically altered paper. After the exploration of these separate techniques, ideas were combined to create final photographic works of art for each of the three methods.

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