

**MINNESOTA STATE COLLEGES AND UNIVERSITIES UNDERGRADUATE RESEARCH  
CONFERENCE OF SCHOLARLY AND CREATIVE ACTIVITY**

LETTER FROM THE PRESIDENT

Welcome to the first MnSCU Undergraduate Research Conference of Scholarly and Creative Activity.

It is a great honor for Minnesota State Mankato to host this inaugural conference. We have a long history of recognizing the research of our own undergraduate students, and we are pleased to be able to showcase the research and creative activity of students from throughout the Minnesota State Colleges and Universities system as well.

The accomplishments embodied in the projects at this year's conference came about through the collaboration of talented, motivated students and dedicated faculty mentors. It takes a tremendous amount of time, energy and passion to complete such projects, and I applaud all those who took part in the process—students, faculty and staff—from every institution involved.

Participating in undergraduate research, and working one-on-one with a faculty mentor in the process, can be a life-changing opportunity for many students. Not only does it enrich a student's collegiate experience, but it also has a wide-reaching impact that can lead to the pursuit of advanced degrees, open doors to career opportunities and encourage a lifelong love of learning.

Minnesota State Mankato is proud to celebrate the achievements of everyone involved in the 2012 MnSCU Undergraduate Research Conference of Scholarly and Creative Activity. Enjoy your time in Mankato!



Richard Davenport  
President  
Minnesota State University, Mankato



# WINONA

## STATE UNIVERSITY

The First Annual Conference of Undergraduate Scholarly and Creative Activity sets the stage for a new level of collaboration and partnership within the Minnesota State Colleges and Universities. Students and faculty of all of our universities will meet in Mankato to acknowledge the accomplishments of our students who have conducted research on a wonderful range of questions across a broad set of disciplines. We all know the power of a research experience on the motivations and engagement of students and the importance of encouraging our students to explore questions of significance to themselves and to the larger world. It is exciting to know that over 120 student groups will be presenting their scholarly and creative work at the Conference in a wide range of formats from oral presentations to poster sessions to visual arts and performances. As all of us look forward to working together to achieve a new level of contribution to the well-being of Minnesota, its communities and its people, we all stand to gain from what we learn at the Conference. We all can enjoy the support that this gathering will offer to our students and to the faculty who mentor them.

We hope that this first gathering will become a tradition within our network of universities and colleges and that many new friendships and collaborations will arise from the experiences that our students and faculty will enjoy at the Conference. This gathering is a milestone along the path of integration of research, education and practice throughout our system and a step toward broadening the role of research creative activity as an equal partner with classroom instruction and community engagement in the preparation of future generations of students who will go on to lead creative, productive and responsible lives.

Winona State University is “a community of learners improving our world.” We are proud to be a part of the MnSCU Undergraduate Conference and we are committed to doing our part in making this Conference a showcase that demonstrates the value of our educational programs and to highlight the many contributions of our faculty and students to the quality of life in Minnesota and the Upper Midwest.

Sincerely,



Judith Ramaley  
President  
Winona State University



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**OFFICE OF THE PRESIDENT**  
**MINNESOTA STATE UNIVERSITY MOORHEAD**

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Greetings:

Our annual Student Academic Conference is a Spring Semester highlight. Since 1998 it has provided an outlet for student research and creative work. Over the years, thousands have shared their knowledge in an environment that encourages inquiring minds and faculty mentoring. It's an activity that underscores our Mission Statement:

‘Minnesota State University Moorhead is a caring community promising all students the opportunity to discover their passions, the rigor to develop intellectually, and the versatility to shape a changing world.’

The conference offers a stage for new ideas from the next generation of researchers and leaders. It advances intellectual development and challenges students to effectively communicate their knowledge. Defending research in a supportive community of student and faculty scholars is a great way to experience personal and professional growth.

Congratulations to the student participants, faculty mentors, and the Student Academic Conference planners. A very good idea has become a wonderful tradition!

Edna Mora Szymanski

President

Minnesota State University Moorhead



It is my pleasure to congratulate and commend the students who are participating in the first MnSCU Student Symposium. This is an outstanding opportunity for undergraduate students from around the state to present their research and scholarly activities and share ideas and knowledge with their peers.

For 15 years St. Cloud State University has provided a similar forum for the hundreds of talented students who each spring take advantage of our Student Research Colloquium. They emerge from their experiences excited about the partnerships they build with other students, faculty mentors and community members during the often-collaborative process of learning, creating and presenting. It is through such activities that students become inspired to discover their creative and intellectual potential and develop the pride and confidence that comes from showcasing the culmination of their hard work.

Earl H. Potter III

President

St. Cloud State University

*Where life and learning meet.™*



**OFFICE of the PRESIDENT**  
700 EAST SEVENTH STREET  
ST. PAUL, MINNESOTA 55106-5000  
TEL: 651-793-1900

March 21, 2012

Dear Undergraduate Research Conference Participants:

It is with great pleasure that I endorse your work as undergraduate researchers. The first MNSCU Conference of Undergraduate Scholarly and Creative Activity is an important milestone for the MNSCU system, undergraduate students, and faculty mentors.

As the president of Metropolitan State University, and a former undergraduate researcher, I know how important original intellectual contributions are for personal and professional development. I also know first-hand the benefits of faculty mentorship—improved collegiate retention, better career preparation, and increased post-bachelorette educational opportunities.

Undergraduate researchers play a pivotal role in fulfilling the mission and vision of the MNSCU system which is aimed at preparing the next generation for an innovation-oriented economy and culture. It is through strong collaborative research that we make the world better. Today more than ever, we need innovation. We need more students like you!

Good luck with your conference presentations!

Respectfully,

A handwritten signature in cursive script that reads "Sue K. Hammersmith".

Sue K. Hammersmith, Ph.D.  
President

March 23, 2012

Dear Attendees of the MnSCU Undergraduate Research Conference,

It is with great pleasure that I write this letter not only of support for the MnSCU Undergraduate Research Conference but also to emphasize the necessity that it be a high priority for future years. Southwest Minnesota State University has had a similar University based Research Conference since 2006 in which several hundred undergraduates have participated each year. In addition several local high schools have brought students to listen to presentations and review projects. We must recognize the need to support innovative and creative thinking within our curriculums across all disciplines.

Conferences such as the SMSU conference and the MnSCU Conference present opportunities for students to move from passive to active learning. It is a paradigm shift for many in the way learning and teaching takes place. I applaud the efforts to insure as a University and a System that we support the movement of such activities to the forefront.

Sincerely,



Ronald A. Wood, PhD  
President  
Southwest Minnesota State University

## Luncheon Keynote Speaker



Dr. Anne E. Blackhurst is the Provost and Senior Vice President for Academic Affairs at Minnesota State University Moorhead. Prior to joining MSU Moorhead, she served as Acting Vice President for Academic and Student Affairs at Minnesota State University, Mankato, where she also served as Dean of Graduate Studies and Research. During her four years as Dean, Dr. Blackhurst increased financial and institutional support for undergraduate research and helped launch the university's Undergraduate Research Center. She received her Ph.D. in College Student Personnel at Ohio University, her master's degree in counseling at the College of Idaho, and her bachelor's degree in economics at Boise State University.

## **A Message from the MSUM Undergraduate Research Center**

It is with great pleasure that we welcome administrators, students, faculty, and staff to the Minnesota Conference of Undergraduate Scholarly and Creative Activity. We are excited to showcase the excellent undergraduate research that takes place at Minnesota State Universities including Minnesota State University- Mankato, Minnesota State University- Moorhead, Winona State University, Southwest Minnesota State University, St. Cloud State University, and Metropolitan State University.

The purpose of the conference is to provide undergraduate students the opportunity to present their research, scholarly, and creative projects through poster and oral presentations, visual displays, and performance art. We hope that the Conference provides intercampus engagement for both faculty and students, builds pipelines between campuses, and highlights the amazing undergraduate research that takes place on our campuses.

The Conference has been planned for over a year, with the combined efforts of the Campus Coordinators (listed on the next page). The vision, commitment and tireless contributions of the Coordinators have made this event possible. In addition, the Minnesota State University- Mankato Undergraduate Research Council has played an essential role in the success of this day, especially the members of the Conference planning subcommittee (listed on the next page).

As you attend the conference, we hope you are able to see the many forms of undergraduate research that occurs on Minnesota State University and College campuses and gain an understanding of the tremendous impact that involvement in undergraduate research has on students' lives.

With Kindest Regards,

Marilyn Hart, Director-Undergraduate Research Center, Minnesota State University-Mankato



## **MN Conference of Undergraduate Scholarly and Creative Activity Campus Coordinators**

### **Minnesota State University- Mankato**

Marilyn Hart- Director Undergraduate Research Center

Cindra Kamphoff- Undergraduate Research Symposium Coordinator

Barry Ries, Interim Dean of Graduate Studies and Research

### **Minnesota State University- Moorhead**

Richard Lahti- Professor of Chemistry

Andrew Conteh- Professor of Political Science

### **Winona State University**

Mike Delong- Director Large Rivers Studies Center

Nancy Jannik- AVP Academic Affairs

### **Southwest Minnesota State University**

Emily Deaver- Professor of Environmental Science

### **St. Cloud State University**

Linda Donnay- Office of Sponsored Programs

### **Metropolitan State University**

Jennifer Schultz- Professor and Curriculum Coordinator for Human Resource Management

## **2011-2012 MSUM Undergraduate Research Council Members**

Marilyn Hart, Director- Undergraduate Research Center \*

Cindra Kamphoff- MSUM Undergraduate Research Symposium Coordinator

Barry Ries- Interim Dean of Graduate Studies and Research

Barbara Bergman \*

Emily Boyd

Christopher Corley

Joseph Holtermann

Mary Susan Johnston

Karla Lassonde

Ihsuan Li \*

Steven Losh

Mark McCullough

Alexandra Panahon \*

Laura Riness

Elizabeth Sandell

Kristin Scott

Mary Visser

Heather Von Bank

Trenton Vorlicek \*

Gina Wenger \*

Forrest Wilkerson

Hongxia Yin

\* denotes members of the MSUM Conference Planning Subcommittee

**Sunday, April 22      Schedule of Events**

6:00 – 9:00 pm	<b>Check-in</b>	CSU Game room
6:00 – 9:00 pm	<b>Evening Social &amp; Pizza</b>	CSU Game room
8:00 – 10:00 pm	<b>Bowling &amp; Billiards</b>	CSU Game room

**Monday, April 23      Schedule of Events**

7:30 am – 3:00 pm	<b>Check-in</b>	CSU Ballroom Lobby
8:00 – 9:30 am	<b>Continental Breakfast, provided</b>	CSU Central Ballroom
8:15 – 8:30 am	<b>Opening Remarks</b> Richard Davenport, President, Minnesota State University Mankato Doug Knowlton, Vice Chancellor, Minnesota State Colleges and Universities	CSU Central Ballroom
8:30 – 10:00 am	<b>Poster Session 1</b> Accounting, Anthropology, Automotive Engineering Technology, Biological Sciences, Business & Public Affairs, Civil Engineering, Education, Gender & Women’s Studies, Human Performance, Interdisciplinary Studies, Marketing, Recreation, Tourism & Therapeutic Recreation, Speech, Language & Hearing Science	CSU Southeast Ballroom
9:00 – 10:00 am	<b>Oral Session 1A</b> Economics	CSU 201
9:00 – 10:00 am	<b>Oral Session 1B</b> Social Science, Sociology	CSU 202
9:00 – 10:20 am	<b>Oral Session 1C</b> Biology, Geology and Earth Science, Geography, Integrated Engineering	CSU 203
9:00 – 10:00 am	<b>Oral Session 1D</b> Art 1	CSU 204
10:10 – 11:10 am	<b>Oral Session 2A</b> English, Theatre	CSU 238

10:10 – 11:10 am	<b>Oral Session 2B</b> History, Philosophy, Political Science	CSU 253
10:10 – 11:10 am	<b>Oral Session 2C</b> Mathematics	CSU 255
11:10 – 11:30 am	<b>Break</b>	
11:30 – 12:45 pm	<b>Celebration Lunch, provided</b>	CSU Central Ballroom
	<b>Luncheon Keynote Speaker</b> Anne Blackhurst, Provost and Senior VP of Academic Affairs, Minnesota State University Moorhead	
12:50 –2:20 pm	<b>Poster Session 2</b> Biological Sciences, Chemistry, Composite Materials Engineering, Earth Sciences, Physics & Astronomy, Psychology, Science, Social Science, Sociology	CSU Southeast Ballroom
12:50 – 2:20 pm	<b>Oral Session 3A</b> Automotive Engineering Technology, Manufacturing Engineering Technology, Physics, Physics & Astronomy	CSU 201
12:50 – 1:50 pm	<b>Oral Session 3B</b> Anthropology, Social Work	CSU 202
12:50 – 1:50 pm	<b>Oral Session 3C</b> Elementary & Early Childhood, Psychology	CSU 203
12:50 – 1:50 pm	<b>Oral Session 3D</b> Art 2	CSU 204
2:00-3:00 pm	<b>Oral Session 4A</b> English, English & Global Studies, Communication Studies	CSU 238
2:00-3:00 pm	<b>Oral Session 4B</b> Marketing, International Business, International Studies, Government	CSU 253
2:00-3:00 pm	<b>Oral Session 4C</b> Nursing, Human Performance	CSU 255



**Accounting, Anthropology, Automotive Engineering Technology, Biological Sciences, Business & Public Affairs, Civil Engineering, Education, Gender & Women's Studies, Human Performance, Interdisciplinary Studies, Marketing, Recreation, Tourism & Therapeutic Recreation, Speech, Language & Hearing Science**

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- 1. Isolation of CD4+ T Cells by the Isolation Kit II from Miltenyi Biotec**  
Hwee Kiat Gong (Dept. of Biological Sciences), St. Cloud State University  
*Marina Cetkovic-Cvrlje, Faculty Mentor (Dept. of Biological Sciences), St. Cloud State University*
  
- 2. How to Detect a Criminal Mind**  
Nathan Funk (Dept. of Accounting), MSU Moorhead  
Tharaka Muthukumarana (Dept. of Accounting), MSU Moorhead  
*James Hansen, Faculty Mentor (Dept. of Accounting), MSU Moorhead*
  
- 3. *Histophilus somni* Causes Extracellular Trap Formation by Bovine Neutrophil and Macrophages**  
Katelyn Forsythe (Dept. of Biology), Winona State University  
Katrina Hellenbrand (Dept. of Pathobiological Sciences), University of Wisconsin-Madison  
Charles Czuprynski (Dept. of Pathobiological Sciences), University of Wisconsin-Madison  
*Nicole Aulik, Faculty Mentor (Dept. of Biology), Winona State University*
  
- 4. An Analysis of Archaeological Excavations at Poverty Point State Historic Site, Louisiana**  
Katie Jacobson (Dept. of Anthropology), MSU Moorhead  
*Blake Clerico (Dept. of Anthropology), MSU Moorhead*  
*Sara Kram (Dept. of Anthropology), MSU Moorhead*  
*Rinita Dalan, Faculty Mentor (Dept. of Anthropology), MSU Moorhead*
  
- 5. Structural Analysis of Heart and Skeletal Muscle in Genetically Altered Mice**  
Kelsey Anderson (Dept. of Biological Sciences), MSU Mankato  
Kelli Wilson (Dept. of Biological Sciences), MSU Mankato  
*Marilyn Hart, Faculty Mentor (Dept. of Biological Sciences), MSU Mankato*
  
- 6. Diesel Methane Research Group**  
Chelsea Mann (Dept. of Automotive Engineering Technology), MSU Mankato  
Calvin Smith (Dept. of Automotive Engineering Technology), MSU Mankato  
Pvakash Shakya (Dept. of Automotive Engineering Technology), MSU Mankato  
Michael Nelson (Dept. of Automotive Engineering Technology), MSU Mankato  
Satish Nakarmi (Dept. of Automotive Engineering Technology), MSU Mankato  
*Bruce Jones, Faculty Mentor (Dept. of Automotive Engineering Technology), MSU Mankato*
  
- 7. Isolating Brain RNA to Determine Genes Involved in Hygienic Behavior in the Honey Bee, *Apis Mellifera***

Laura Chopp (Dept. of Biology), MSU Mankato  
*Daniel Toma, Faculty Mentor (Dept. of Biology), MSU Mankato*

**8. The Hire Act Impact**

Annette Magnus (Accounting Program), Southwest MSU  
*Will Thomas, Faculty Mentor (Accounting Program), Southwest MSU*

**9. Big Wyoming Sagebrush Screens UV Radiation More Effectively at Higher Altitudes**

Michael Dyslin (Dept. of Biological Sciences), MSU Mankato  
*Christopher Ruhland, Faculty Mentor (Dept. of Biological Sciences), MSU Mankato*  
*John Krenz, Faculty Mentor (Dept. of Biological Sciences), MSU Mankato*

**10. IFRS vs. US GAAP Convergence Timeline**

Tiffany Zins (Accounting Program) Southwest MSU  
*Will Thomas, Faculty Mentor (Accounting Program), Southwest MSU*

**11. Vascular Regrowth Following Partial Hepatectomy in Rat**

Courtney Frank (Dept. of Biology), MSU Mankato  
Kayla Anderson (Dept. of Biology), MSU Mankato  
*Michael Bentley, Faculty Mentor (Dept. of Biology), MSU Mankato*

**12. Fair Market Value is Not Reliable in a Corrupt Business Environment**

Megan McFarland (Accounting Program), Southwest MSU  
Samantha Swart, (Accounting Program), Southwest MSU  
*Will Thomas, Faculty Mentor (Accounting Program), Southwest MSU*

**13. Characterization of the Novel Polyglutamine Protein FAM171B**

Han Byul Lee (Dept. of Biology), MSU Mankato  
*Geoffrey Goellner, Faculty Mentor (Dept. of Biology), MSU Mankato*

**14. The Effect of Bisphenol-A (BPA) on the Feminization of Danio Refio**

Lina Wang (Dept. of Biological Sciences)  
*Theresa Salerno, Faculty Mentor (Dept. of Chemistry)*  
*Shannon Fisher, Faculty Mentor (Dept. of Biological Sciences)*

**15. Teacher Candidates' Perceptions of Appropriate Social Network Use**

William Scott (Dept. of Education), MSU Moorhead  
*David Tack, Faculty Mentor (Dept. of Marketing), MSU Moorhead*

**16. Commercials and College: The Negative Effects on Body Image**

Madeline Greene (Dept. of Gender and Women's Studies), MSU Mankato  
*Megan Peters, Graduate Student Mentor (Dept. of Gender and Women's Studies), MSU Mankato*  
*Maria Bevacqua, Faculty Mentor (Dept. of Gender and Women's Studies), MSU Mankato*

- 17. Training Design**  
 Heather Grimes (Dept. of Biology), Metropolitan State University  
*Jennifer Schultz, Faculty Mentor (Dept. of Human Resource Management), Metropolitan State University*
- 18. “Just Plain Inaccurate”: Ensuring the Accuracy and Dependability of the Bioelectrical Impedance Analysis (BIA) Device in the Health Fitness Industry**  
 Jacob Mehrhoff (Dept. of Human Performance), MSU Mankato  
*Stacy Ebner, Student Mentor (Dept. of Human Performance), MSU Mankato*  
*Robert Pettitt, Faculty Mentor (Dept. of Human Performance), MSU Mankato*  
*Rachel Wentz, Faculty Mentor (Dept. of Human Performance), MSU Mankato*
- 19. The Effects of Diet on Exploratory-Boldness Behavioral Syndrome in Zebra Fish (Danio rerio)**  
 Alane Korf (Dept. of Biosciences), MSU Moorhead  
*Shireen Alemadi, Faculty Mentor (Dept. of Biosciences), MSU Moorhead*
- 20. Does Wal-Mart Hurt Local Businesses?**  
 Lacey Wintz (Interdisciplinary Studies), Southwest MSU,  
*Richard Herder, Faculty Mentors (Speech Program), Southwest MSU*  
*Will Thomas, Faculty Mentors (Accounting Program), Southwest MSU*
- 21. Development of Validated Proliferation Assays for Translational Therapeutics**  
 Alexander Novak (Dept. of Biosciences), MSU Moorhead  
 Harrison Pantera (Dept. of Biosciences), MSU Moorhead  
*Mark Wallert, Faculty Mentor (Dept. of Biosciences), MSU Moorhead*
- 22. Should Student Loans Be Forgivable in Bankruptcy?**  
 Cheri Fjermestad (Interdisciplinary Studies), Southwest MSU  
*Richard Herder, Faculty Mentors (Speech Program), Southwest MSU*  
*Will Thomas, Faculty Mentors (Accounting Program), Southwest MSU*
- 23. Sexual Selection in Guppies**  
 Amy Moorhouse (Dept. of Biosciences), MSU Moorhead  
*Shireen Alemadi, Faculty Mentor (Dept. of Biosciences), MSU Moorhead*
- 24. College Student’s Electronic Replacement Propensity: The When, How and Why**  
 Lindsay Bertolino (Dept. of Marketing), MSU Mankato  
*Kristin Scott, Faculty Mentor (Dept. of Marketing), MSU Mankato*
- 25. The Effects of Atmospheric Carbon dioxide Levels on Plant-Herbivore Interactions**  
 Brittany Beers (Dept. of Biosciences), MSU Moorhead  
 Amy Moorhouse (Dept. of Biosciences), MSU Moorhead  
*Alison Wallace, Faculty Mentor (Dept. of Biosciences), MSU Moorhead*

**26. Sociability with a Splash**

Amanda Lilla (Dept. of Recreation, Tourism & Therapeutic Recreation), Winona State University  
Jillian Rudar (Dept. of Recreation, Tourism & Therapeutic Recreation), Winona State University  
Kalli Tuma (Dept. of Recreation, Tourism & Therapeutic Recreation), Winona State University  
*B. Aybar Damali, Faculty Mentor (Dept. of Recreation, Tourism & Therapeutic Recreation), Winona State University*

**27. Impact on the Setting Time and Strength of Concrete While Using a Coloring Agent**

Khondoker Ashif (Dept. of Civil Engineering), MSU Mankato  
*Farhad Reza, Faculty Mentor (Dept. of Civil Engineering), MSU Mankato*

**28. Sociability of the Winona Public Library**

John IV Haldeman (Dept. of Recreation, Tourism & Therapeutic Recreation), Winona State University  
Chelsea Hawkridge (Dept. of Recreation, Tourism & Therapeutic Recreation), Winona State University  
Tom Lepke (Dept. of Recreation, Tourism & Therapeutic Recreation), Winona State University  
Jenny Schuler (Dept. of Recreation, Tourism & Therapeutic Recreation), Winona State University  
*B. Aybar Damali, Faculty Mentor (Dept. of Recreation, Tourism & Therapeutic Recreation), Winona State University*

**29. Effects of Flocculent on Storm Water Sediment Detention**

Jerry Schimmel (Dept. of Civil Engineering), MSU Mankato  
Chase Radue (Dept. of Civil Engineering), MSU Mankato  
Nripendra Bastola (Dept. of Civil Engineering), MSU Mankato  
Hyunjung Lee (Dept. of Civil Engineering), MSU Mankato  
Akinola Asaolu (Dept. of Civil Engineering), MSU Mankato  
*Stephen Druschel, Faculty Mentor (Dept. of Civil Engineering), MSU Mankato*

**30. “Now Hear This”**

Maria Lendobeja (Dept. of Speech, Language & Hearing Science), MSU Moorhead  
*Mary Drake, Faculty Mentor (Dept. of Speech, Language & Hearing Science), MSU Moorhead*

**31. Before and After: Eye Highlight and Contour**

Sia Lor (Theatre Program), Southwest MSU  
*Sheila Tabaka, Faculty Mentor (Theatre Program), Southwest MSU*

**32. Photometric Observations Conducted at Paul P Feder Observatory**

Shouvik Bhattacharya (Dept. of Physics and Astronomy), MSU Moorhead  
*Linda Winkler, Faculty Mentor (Dept. of Physics and Astronomy), MSU Moorhead*



**1. Isolation of CD4+ T Cells by the Isolation Kit II from Miltenyi Biotec**

Hwee Kiat Gong (Dept. of Biological Sciences), St. Cloud State University

*Marina Cetkovic-Cvrlje, Faculty Mentor (Dept. of Biological Sciences), St. Cloud State University*

The regulation of the cellular immune response in autoimmune type-1 diabetes (T1D) is not yet fully understood. However, it is known that CD4+T cells play a vital role in the immunopathogenesis of T1D. In order to gain detailed knowledge on the effect and function of these cells in the development of T1D, isolating a pure population of CD4+T cells directly from heterogeneous splenic cell population becomes an indispensable method. CD4+T Cell Isolation Kit I (Miltenyi Biotec) and EasySep® Mouse CD4 Positive Selection Kit (StemCell Technologies), previously used in our lab for positive isolation of CD4+T cells, yielded  $70.6 \pm 5.8\%$  and  $88.1 \pm 2.3\%$  purity, respectively, and recovery of  $116.9 \pm 34.2\%$  and  $60.6 \pm 13.0\%$ , respectively. In this study, we aimed to study the purity and recovery of wild-type (WT) and JAK3-deficient (KO) C57BL/6 mice CD4+T cells obtained by a negative selection method using the CD4+T Cell Isolation Kit II (Miltenyi Biotec). Unlike magnetically labeling CD4+T cells in positive selection, CD4+T Cell Isolation Kit II isolates CD4+T cells from single cell suspensions of splenocytes by depleting non CD4+T cells (i.e., B cells, NK cells, monocytes, platelets, dendritic cells, CD8+T cells, granulocytes and erythrocytes), labeled by the biotin-conjugated antibodies. Next, a magnetic column and magnetic separator are used to separate CD4+T cells from the labeled non-CD4+T cells. Isolated CD4+T cells are bead- and antibody- free and suitable for any downstream in vitro application, such as proliferation or cytokines assays. Our preliminary results showed  $87.2 \pm 6.9\%$  (WT) and  $76.3 \pm 6.3\%$  (KO) purity, and recovery of  $54.4 \pm 29.3\%$  (WT) and  $36.3 \pm 13.6\%$  (KO), respectively, indicating better purity and recovery rate in WT vs. KO mice.

**2. How to Detect a Criminal Mind**

Nathan Funk (Dept. of Accounting), MSU Moorhead

Tharaka Muthukumarana (Dept. of Accounting), MSU Moorhead

*James Hansen, Faculty Mentor (Dept. of Accounting), MSU Moorhead*

Fraud is an intentional deception made for personal gain or damage to another individual. A typical organization loses up to five percent of its annual revenue to fraud, with a median loss of \$160,000. Fraud is rapidly spreading through businesses, banks, manufacturing, and the government. Types of fraud include: Embezzlement, tax fraud, identity fraud, vendor schemes, and Ponzi schemes. According to recent research identity fraud is rising through the use of income tax returns and refunds. The fraud triangle is a valuable tool in determining how fraud occurs and how it can be detected. If all three elements of the fraud triangle are present, there is a good chance fraud is occurring. Fraud, which costs U.S. companies billions of dollars each year, is rapidly growing.

**3. *Histophilus Somni* Causes Extracellular Trap Formation by Bovine Neutrophil and Macrophages**

Katelyn Forsythe (Dept. of Biology), Winona State University

Katrina Hellenbrand (Dept. of Pathobiological Sciences), University of Wisconsin-Madison

Charles Czuprynski (Dept. of Pathobiological Sciences), University of Wisconsin-Madison

*Nicole Aulik, Faculty Mentor (Dept. of Biology), Winona State University*

Bovine respiratory disease (BRD) is a fibrinous pleuropneumonia caused by a combination of bacterial and viral pathogens, also known as shipping fever. One causative agent of BRD is the Gram-negative coccobacillus *Histophilus somni*. Recently, bovine neutrophils and macrophages have been found to produce extracellular traps (ETs) in response to certain bacteria. This form of cell death, termed ETosis, causes the release of antimicrobial-studded deoxyribonucleic acid (DNA) into the extracellular environment from activated neutrophils. This process occurs without phagocytosis in which bacteria are trapped and killed in the ET complexes. Here, we demonstrate that *H. somni* causes ET formation from bovine neutrophils and macrophages that trap and destroy *H. somni* cells. There are two main focal points for our research: to confirm that *H. somni* causes NET formation and characterize that formation and to determine if *H. somni* causes macrophage extracellular trap formation, which has only been recently discovered. ETs were quantified using the fluorescent marker Pico Green, in which we confirmed that *H. somni* causes ETs from bovine neutrophils and macrophages. Confocal and scanning electron microscopy was also used to visualize the extracellular traps. Neutrophil ETs produced in response to *H. somni* did trap and kill the bacterial cells. Identification of these ETs in response to *H. somni* provides us with a better understanding of how the innate immune response interacts with this pathogen. We expect this research will lead us to a better understanding of the role ETs play during an infection with *H. somni*.

#### **4. An Analysis of Archaeological Excavations at Poverty Point State Historic Site, Louisiana**

*Katie Jacobson (Dept. of Anthropology), MSU Moorhead*

*Blake Clerico (Dept. of Anthropology), MSU Moorhead*

*Sara Kram (Dept. of Anthropology), MSU Moorhead*

*Rinita Dalan, Faculty Mentor (Dept. of Anthropology), MSU Moorhead*

Minnesota State University Moorhead students conducted archaeological studies at the Poverty Point State Historic Site in northwest Louisiana in June of 2011. This complex site with large earthen mounds and ridges is listed as a National Historic Landmark by the U.S. Dept. of the Interior. Fieldwork, supervised by MSUM professor Rinita Dalan, Poverty Point Station Archaeologist Diana Greenlee, and Assistant Station Archaeologist and Interim Regional Archaeologist Fran Hamilton, included the continuation of excavations initiated in 2009, geophysical measurements across excavation floors and walls, water screening of excavated sediments, flotation for seeds, charcoal, bone fragments, beads, and other small artifacts, and lab work. Excavations took place in the plaza of site in the area of a large (approximately 20 m in diameter) circular feature that had been discovered by a magnetometer survey. Though the function of this unusual circular feature is not known, excavations revealed that it was constructed of large, closely spaced posts. The material in the post-holes was highly magnetic, comprised of Poverty Point objects (fired silt balls) and charcoal in an organically rich matrix. Ongoing analysis of these findings is helping to broaden our knowledge of activities of the prehistoric Poverty Point culture.

#### **5. Structural Analysis of Heart and Skeletal Muscle in Genetically Altered Mice**

*Kelsey Anderson (Dept. of Biological Sciences), MSU Mankato*

*Kelli Wilson (Dept. of Biological Sciences), MSU Mankato*

*Marilyn Hart, Faculty Mentor (Dept. of Biological Sciences), MSU Mankato*

Striated muscle, including heart and skeletal, is characterized by the precise alignment of the two prevalent muscle proteins, actin and myosin. Actin capping protein (CP) plays a significant role in the

assembly of muscle fibers and contributes to maintaining the organization of the filaments. CP is a heterodimer composed of an alpha and beta subunit. In higher organisms, there are 3 isoforms of the alpha ( $\alpha_1$ ,  $\alpha_2$ ,  $\alpha_3$ ) and 3 isoforms of the beta subunit ( $\beta_1$ ,  $\beta_2$ ,  $\beta_3$ ). The  $\beta_1$  is the predominate isoform of muscle tissue;  $\beta_2$  is the predominate isoform of non-muscle tissue. Dr. Marilyn Hart, Dept. of Biological Sciences, produced transgenic mice with a reduced amount of CP $\beta_1$ . The hearts of the genetically altered mice had disorganized filaments and enlarged chamber walls. In this study, both skeletal and heart muscle of genetically altered and wild type mice were compared to evaluate morphological differences. The skeletal and heart tissues of six month old mice were collected and fixed in formalin, dehydrated using a graded series of alcohol, exchanged with xylene, and imbedded with paraffin using an automated Leica Tissue Processor, TP1020. Sections (7-8 microns) were prepared using a microtome, collected on gelatin-coated slides and stained with a biological differential stain, hemotoxilyn and eosin. We found that the skeletal and heart muscle were disorganized with altered periodicity and alignment of the filaments in the genetically altered mice relative to the wild type.

## **6. Diesel Methane Research Group**

Chelsea Mann (Dept. of Automotive Engineering Technology), MSU Mankato

Calvin Smith (Dept. of Automotive Engineering Technology), MSU Mankato

Pvakash Shakya (Dept. of Automotive Engineering Technology), MSU Mankato

Michael Nelson (Dept. of Automotive Engineering Technology), MSU Mankato

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Diesel and compressed natural gas, or methane gas, are two common fuels used every year in many industries and households. When these two fuels are utilized simultaneously in one unit, such as a Diesel engine, it is referred to as a Dual Fuel system. The benefits of such a system include major cost cuts, lower harmful emissions, and higher engine efficiencies. The compressed natural gas (CNG) used in our research was provided to us by Environmental Technologies, Inc. Their focus is a unique process for digesting manure from farms, which collects and cleans the methane gas provided from the waste. This creates a clean CNG product usable for our diesel engine. To perform our research we utilized a computerized CNG injection system, which converts CNG from high to low pressure, while injecting it in precise amounts in the engine. The data that we have collected includes exhaust emissions and efficiency readings from the engine while running on just Diesel, and then while running the Dual Fuel system. We were able to take this data and analyze it to prove that the Dual Fuel combination provides benefits. The standard operating procedures used in the research process were developed based on standards set by the Code of Federal Regulations and similar published research. Creating an optimum balance of the two fuels during use will allow for the highest capital return, while allowing companies and operations that have a CNG source to translate its energy opportunity to a readily available transportation fuel.

**7. Isolating Brain RNA to Determine Genes Involved in Hygienic Behavior in the Honey Bee, *Apis Mellifera***

Laura Chopp (Dept. of Biology), MSU Mankato

*Daniel Toma, Faculty Mentor (Dept. of Biology), MSU Mankato*

Honeybees are an integral part of the agricultural industry, especially in the Midwestern United States. Honeybees serve as pollinators of crops, an invaluable job of honeybees, as well as producers of honey. Diseases that kill members of the colony threaten honeybee colonies, typically only partially treatable with pesticides. Hygienic behavior, meaning the bees clean out diseased brood from the hive, confers a natural resistance to three diseases of bees: American foulbrood, chalkbrood, and varroa mite. However, it is not found in all colonies and only a certain number of honeybees contain this behavior in a given colony. This desirable behavior can be traced to genetics—meaning hygienic honeybees exhibit this behavior partly due to information they carry in their DNA (genetic material). We are undertaking a large genetic screen in cooperation with Dr. Marla Spivak of the Entomology Dept. at the University of Minnesota. To isolate specific genes, we will look for differences between genes used in brains from hygienic honeybees vs. non-hygienic honeybees. The brains must be dissected and the appropriate genetic material (RNA) isolated for comparison. This comparison between the RNA of hygienic and non-hygienic bees will be done at the genomics facility at the University of Illinois.

**8. The Hire Act Impact**

Annette Magnus (Accounting Program), Southwest MSU

*Will Thomas, Faculty Mentor (Accounting Program), Southwest MSU*

The 2010 Hire Act provided tax incentives for businesses to help reduce the high unemployment rate and to stimulate the economy. Looking at the unemployment rate before the act was implemented and after it expired will determine if the act actually reduced the unemployment rate. The employment rate did not decrease enough to affirm the positive effect on the economy. In conclusion, the Hire Act was unsuccessful in stimulating the economy by reducing the unemployment rate.

**9. Big Wyoming Sagebrush Screens UV Radiation More Effectively at Higher Altitudes**

Michael Dyslin (Dept. of Biological Sciences), MSU Mankato

*Christopher Ruhland, Faculty Mentor (Dept. of Biological Sciences), MSU Mankato*

*John Krenz, Faculty Mentor (Dept. of Biological Sciences), MSU Mankato*

The flux of biologically effective ultraviolet radiation (UV; 280-400nm) reaching the Earth's surface diminishes at lower elevations, which may cause physiological and morphological phenotypic differences within plant populations. We examined epidermal UV-screening effectiveness in *Artemisia tridentata* ssp. *wyomingensis* (Big Wyoming Sagebrush) along an 800 m elevation gradient in central Wyoming with a pulse amplitude modulated UV fluorometer. Epidermal transmittance of UV increased at lower elevations; adaxial UV-transmittance values ranged from 10.2% (low elevation) to 2.3% (high elevation). To provide a proximate explanation for this relationship, we collected plants from across the gradient and estimated the concentration of bulk-soluble UV-absorbing compounds (spectrophotometry;  $\lambda=300$  and 365 nm) and the density of adaxial leaf hairs (epifluorescence microscopy). Concentrations of UV-

absorbing compounds increased with elevation and ranged from 0.64 to 2.25 A300 cm<sup>-2</sup> and 0.43 to 1.35 A365 cm<sup>-2</sup>. Trichome density also increased from a mean of 14,400 cm<sup>-2</sup> at low elevation to a mean of 22,500 cm<sup>-2</sup> at high elevation. Because the distance along the elevation gradient was only 18 km, gene flow likely prevents ecotypic differentiation; the ultimate cause of the cline in screening effectiveness is likely the evolution of phenotypic plasticity in both biochemical and anatomical properties of leaves in response to UV stimuli.

#### **10. IFRS vs. US GAAP Convergence Timeline**

Tiffany Zins, (Accounting Program) Southwest MSU

*Will Thomas, Faculty Mentor (Accounting Program), Southwest MSU*

Over the past twenty years, differences between U.S. and international accounting standards have led to complications for companies that operate both in the U.S. and in other countries. To make operating in other countries easier, the International Accounting Standards Board and the Financial Accounting Standards Board have been working to bring convergence to the two sets.

#### **11. Vascular Regrowth Following Partial Hepatectomy in Rat**

Courtney Frank (Dept. of Biology), MSU Mankato

Kayla Anderson (Dept. of Biology), MSU Mankato

*Michael Bentley, Faculty Mentor (Dept. of Biology), MSU Mankato*

The purpose of this study is to examine the growth and regeneration of the vasculature of the liver following a partial hepatectomy. The regeneration of the hepatocytes of the liver has been studied extensively, but little attention has been directed towards the regeneration of the supportive vasculature. The vasculature of the liver is highly complex. The liver receives blood from hepatic arteries as well as the hepatic portal vein; therefore, the blood supply in the capillaries (hepatic sinusoids) is a mixture of arterial and portal blood. It is currently unknown how this complex circulation is reestablished in relationship to the regeneration of hepatocytes. In order to perform this study, a group of rats were assigned to one of two groups. The first group was composed of rats that were given the experimental surgery and the other group was given the sham surgery. The vasculature was prepared for viewing two days after the hepatectomy. The vasculature was then viewed under the scanning electron microscope. After viewing the vasculature, it appears that there is fenestration of the sinusoids in the experimental rat, but no fenestration occurs in the control group. However, further investigation is underway. In conclusion, it seems the vasculature in the livers of the experimental group are compensating for the portion of the liver that was removed.

#### **12. Fair Market Value is Not Reliable in a Corrupt Business Environment**

Megan McFarland (Accounting Program), Southwest MSU

Samantha Swart, (Accounting Program), Southwest MSU

*Will Thomas, Faculty Mentor (Accounting Program), Southwest MSU*

Reporting financial assets at their fair market value can provide a relevant metric for investors assessing the health of a business entity when they are honestly valued. However, in a business climate rife with corruption and fraud, it is impossible to rely on the accuracy of such valuations. We researched

periodicals and online news sources to prove that when incorrect and improper assessments can be purchased from corrupt estimators, the financial statements of those entities do not fulfill their intended purpose. We used India's business climate as a case study due to its high levels of foreign direct investment and high ranking on corruption indices. We found that in a business environment such as India's, fair market valuation is not a reliable indicator of actual asset value. We concluded that, in a corrupt environment, historical cost valuation will provide for much more reliable, and therefore usable, financial statements.

### **13. Characterization of the Novel Polyglutamine Protein FAM171B**

Han Byul Lee (Dept. of Biology), MSU Mankato

*Geoffrey Goellner, Faculty Mentor (Dept. of Biology), MSU Mankato*

FAM171B is a completely uncharacterized protein (identified via the human genome sequencing project) that contains a polyglutamine (polyQ) stretch within its primary amino acid sequence. PolyQ tract proteins are particularly interesting, as expansion mutations within them have been shown to underlie a growing number of severe neurodegenerative disorders such as Huntingtons Disease and Spinocerebellar Ataxia. Using a bioinformatics approach, we find that FAM171B not only contains a polyQ region near its amino-terminus, but also is likely expressed in the nervous system and contains both a putative signal sequence and a single transmembrane domain. These data suggest that FAM171B normally functions within the endomembrane system of neurons- and mutations within the polyQ tract may underlie an as yet molecularly uncharacterized neurodegenerative disease. In this study, we set out to not only shed light on the normal cellular function of FAM171B (by identifying its intracellular localization), but also to assay the degree of polymorphism within its polyQ tract (an indication of expansion mutation propensity). Using immunofluorescence assays, we find that FAM171B displays a punctate vesicular-like staining pattern within the cytoplasm of HELA and HEK cells- consistent with bioinformatics predictions. In addition, using DNA genotyping assays, we find that the polyQ tract within FAM171B is quite stable within the human population (96.5% homogeneity)- suggesting FAM171B should not be considered a strong candidate gene for neurodegenerative disease. The preliminary outcomes, from the combined studies of localization and polymorphism, characterize FAM171B as a stable cytoplasmic protein localizing to vesicular organelles- such as, mitochondria or endosomes.

### **14. The Effect of Bisphenol-A (BPA) on the Feminization of Danio Refio**

Lina Wang (Dept. of Biological Sciences)

*Theresa Salerno, Faculty Mentor (Dept. of Chemistry)*

*Shannon Fisher, Faculty Mentor (Dept. of Biological Sciences)*

In lakes and rivers all across the world, there has been an increase in the feminization of male fish due to the presence of endocrine disrupters (Rhee et al., 2010). It has been found that pollutants such as Bisphenol-A (BPA), farm runoff, and soil contaminants from municipal wastewater treatment plants can increase the amount of endocrine disrupters in water systems (Kidd et al., 2006). The project focused on BPA and its effect on adult and juvenile fish. Danio rerio were exposed to BPA concentrations of 0.0, 0.2 parts per billion (ppb), 2.0 ppb, and 20.0 ppb for one week. During this week, D. rerio spawned and the eggs were collected. The fish fry were exposed to the same concentrations as the parent generation until they reached adulthood. Through the use of statistical analysis it was found that there was a significant

difference in the percent fertilized for 0.0 ppb vs 2.0 ppb ( $p=0.001$ ) and 0.2ppb vs 20.0 ppb ( $p=0.003$ ). There was no significant difference in percent survived or percent hatched for all concentrations ( $p>0.05$ ). The young were visually observed to have a larger ratio of females to males in all concentrations. It is possible that these results are caused by something other than the BPA, such as stress, nutrients available, or randomness of fish health. More testing should be done to pinpoint the exact cause of difference in higher BPA concentrations. At this point, it seems that BPA does have a role in the ratio of females in D. rerio.

### **15. Teacher Candidates' Perceptions of Appropriate Social Network Use**

William Scott (Dept. of Education), MSU Moorhead

*David Tack, Faculty Mentor (Dept. of Marketing), MSU Moorhead*

The purpose of this action research study was to examine entry-level teacher candidates' perceptions of appropriate social network use. Having seen that educators are held to a higher set of standards and expectations both by the general public and the schools for which they work, we wanted to see if these candidates understood the importance of what information they chose to make public to these entities. Dr. Tack's courses were studied, which consisted of 36 students. We analyzed both existing data from classroom assignments (a poll on perceptions of social network use) and data gathered from the students' publicly displayed information on Facebook. The data was coded based upon the appropriate use guidelines for students and educators used by a local school district to determine whether or not the teacher candidates were using appropriate judgment in regards to the information they chose to make public on their Facebook pages. Results showed most of the students' content to be appropriate; however, those who violated appropriate use guidelines did so egregiously. Based upon the results, further education is needed within the School of Teaching and Learning regarding appropriate use of Facebook and social media.

### **16. Commercials and College: The Negative Effects on Body Image**

Madeline Greene (Dept. of Gender and Women's Studies), MSU Mankato

*Megan Peters, Graduate Student Mentor (Dept. of Gender and Women's Studies), MSU Mankato*

*Maria Bevacqua, Faculty Mentor (Dept. of Gender and Women's Studies), MSU Mankato*

It seems as if people can never escape the media and the images it produces. This is shown in relation to college students and their ability to be connected to the media, in some way or another, at all points of their everyday life. Although the media has had positive effects on society such as serving as a source of news and educating the public nevertheless this study provides information demonstrating that the media, specifically the six commercials used in this study, have a negative effect on the body image of college aged women because it gives women an unobtainable and unhealthy image of how they should feel and what their bodies should look like. Through content analysis, interviews, and surveys, this study takes a deeper look at commercials and their direct correlation to the demise of college women's body image. While many campaigns aim to combat this epidemic, this study illustrates that college women are still subject to the negative effect of these ads and will continue to strive for an unrealistic body image. Throughout my research, I have found that it is not impossible to separate the images in the commercials from the thoughts of body image but in today's world, college aged women are less likely to do so.

Despite the positive attributes the media has in regards to society, I argue that the negative effects the media has on women's body image, specifically college aged women, is too large an issue to ignore.

### **17. Training Design**

Heather Grimes (Dept. of Biology), Metropolitan State University

*Jennifer Schultz, Faculty Mentor (Dept. of Human Resource Management), Metropolitan State University*

This poster is a flow chart interpreting the steps needed in the training design process, recreated from the book *Employee Training and Development* by Raymond A. Noe. Needs Assessment: Organization analysis is represented by the non-dairy cow farm, person analysis by the brain picture, and task analysis by the circus mom. Ensuring Employees' Readiness for Training: In this picture there is a woman climbing a tree, she must have the basic skills needed to do this task. Creating a Learning Environment: To create a learning environment the trainer must first know what the learning objectives are going to. Some things are best trained by using modeling and feedback is always welcome. Ensuring Transfer of Training: The word game Scrabble is a great illustration for showing how to use skills and abilities as well as cognitive thinking. The board with positive words represents peers and manager support while the tile rack is self-management. Developing an Evaluation Process: The bird flying away with the string represents identifying learning objectives, if the objectives are not clear the trainee may not remember what is important and what is not. The human head shows the uniqueness to choosing evaluation design. The watch show both time and expense. Selecting Training Method: There is e-learning or traditional learning, each has its pros and cons. Monitoring and Evaluating the Program: If after a training session on how to play darts someone went home and threw this, there would be some concern.

### **18. "Just Plain Inaccurate": Ensuring the Accuracy and Dependability of the Bioelectrical Impedance Analysis (BIA) Device in the Health Fitness Industry**

Jacob Mehrhoff (Dept. of Human Performance), MSU Mankato

*Stacy Ebner, Student Mentor (Dept. of Human Performance), MSU Mankato*

*Robert Pettitt, Faculty Mentor (Dept. of Human Performance), MSU Mankato*

*Rachel Wentz, Faculty Mentor (Dept. of Human Performance), MSU Mankato*

Despite years of research by health practitioners, much of the understanding and testing equipment has not been done on newer models of equipment. Since the development of assessing the body, and its composition; health professionals try to make their assessments as accurate as possible. These numbers have been so commonly accepted that most never stop to question their accuracy and validity. Most individuals don't understand the processes that were used in making the equipment, therefore making it difficult to understand the devices and their assessments rationally. As a health professional, I personally have administered hundreds of body composition tests with a plethora of individuals from all body types. This lead to my hypothesis that one of the most commonly used devices on the market today (BIA \$50.00 retail value) can be incredibly inaccurate because of how it's used. The research done was performed on 66 individuals with the BIA, and 13 of these individuals were also measured using the BOD POD (Air Displacement \$50,000.00 retail value). Comparing the results has confirmed my hypothesis that the current method of administering the BIA should be modified to increase accuracy. Using the BIA, some individuals tested up to a 37% difference in fat mass simply by changing their way of holding the device. For many people, this difference easily stratifies them from healthy categories, to dangerous categories of



body fat. This can play a destructive role in their lives, and not the helpful role that the assessment is intended for.

### **19. The Effects of Diet on Exploratory-Boldness Behavioral Syndrome in Zebra Fish (*Danio rerio*)**

Alane Korf (Dept. of Biosciences), MSU Moorhead

*Shireen Alemadi, Faculty Mentor (Dept. of Biosciences), MSU Moorhead*

Zebra fish (*Danio rerio*) are a great model organism especially in behavior and molecular genetic studies because they can survive and breed in laboratory settings. They have a high reproduction rate and reach sexual maturity early. Zebra fish are known to exhibit exploratory-boldness behavioral syndrome; which could be considered suitable for survival in the context of foraging or courtship, but may be maladaptive in terms of predation. These behavioral traits appear to be genetically linked, yet the causes of these predispositions are unknown. These exploratory behaviors may be tied to diet. An initial run will determine proportion of bold vs. shy on regular diet. We then established two feeding groups: good diet (two doses of bloodworms per day) and poor diet (one dose of bloodworms per day). After two weeks, fish were tested again using a serial maze designed to examine exploratory behavior. We expected good diet fish to be bolder because of lower stress levels and the ability to spend energy on exploration.

### **20. Does Wal-Mart Hurt Local Businesses?**

Lacey Wintz (Interdisciplinary Studies), Southwest MSU,

*Richard Herder, Faculty Mentors (Speech Program), Southwest MSU*

*Will Thomas, Faculty Mentors (Accounting Program), Southwest MSU*

During the past quarter century, large multi-store retailers have experienced considerable growth. Wal-Mart is the largest retail store in the world. With this in mind, I am trying to answer the question whether Wal-Mart is hurting small local businesses. Specifically, what is Wal-Mart's effect on local businesses when they enter a town? I have researched the topic by reading many articles that support both sides. I have found that there are many good arguments in favor of Wal-Mart as well as against Wal-Mart. Although Wal-Mart has some positive effects on a local economy, the negative effects of a Wal-Mart on small businesses are much worse.

### **21. Development of Validated Proliferation Assays for Translational Therapeutics**

Alexander Novak (Dept. of Biosciences), MSU Moorhead

Harrison Pantera (Dept. of Biosciences), MSU Moorhead

*Mark Wallert, Faculty Mentor (Dept. of Biosciences), MSU Moorhead*

For a new drug to enter clinical trials a company must receive an Investigational New Drug approval from the Food and Drug Administration. This requires a range of supporting data, a major portion of which comes from validated cell-based assay. Validation is demonstrating the ability to provide consistent, reproducible results from assays by assessing the impact of key variables on results. In our project we are validating cell proliferation assays for the lung cancer cell line NCI-H1299. We will assess cell population using an XTT assay. Our experimental plan includes: 1) determination of population doubling time to calculate a baseline rate of cell proliferation; 2) assessment of linear correlation, to determine the range of cell population where there is a linear relationship between cell number and readout; 3)

determination of initial cell density, to assess optimal seeding density; and 4) evaluation of edge effects to ensure that well location does not impact assay outcome. In our initial experiments we have determined the doubling time for the H1299 cells to be 21.24 +/- 1.43 hours. Full data from the validated assays will be presented. This work supported by MSUM Biopharmaceutical Industry Apprentice Scholarships sponsored by the GFMEDC to AN and HP.

## **22. Should Student Loans Be Forgivable in Bankruptcy?**

Cheri Fjermestad (Interdisciplinary Studies), Southwest MSU

*Richard Herder, Faculty Mentors (Speech Program), Southwest MSU*

*Will Thomas, Faculty Mentors (Accounting Program), Southwest MSU*

In 1976, the first legislation was passed that made it difficult to discharge student loan debt in bankruptcy. Over the years, more laws were passed, and in 2005, legislation was passed that made both federal and private student loans unforivable unless debtors could prove undue hardship. With student loan debts becoming higher and harder to pay back, we have started to wonder: should student loans be forgivable in bankruptcy? I have examined the recent legislation, and I have read what experts on both sides of the argument have to say. It is time for bankruptcy reform with respect to how student loans are treated. Undue hardship needs to be done away with in favor of a universally applied standard that determines if someone is eligible to have his/her student loan debt forgiven in bankruptcy.

## **23. Sexual Selection in Guppies**

Amy Moorhouse (Dept. of Biosciences), MSU Moorhead

*Shireen Alemadi, Faculty Mentor (Dept. of Biosciences), MSU Moorhead*

Female guppies use sexual selection for acquiring the best choice for a mate among multiple contenders. Males will court a female using the sigmoid display by forming an S-shape during his display. If a female is attracted to the male, she will move toward him in a slow, non-aggressive manner. It has been shown that the color and size of a male contributes to the female's choice of mates. Our hypothesis is that the female will choose the males and will select for the larger, more carotenoid-colored males. We will place a small male and a large male in a 10 gallon tank and introduce a female into the same aquarium, then observe mate choice. We will repeat this set up with the same males and multiple independent female trials to see if the same male is consistently chosen. We will use the same design for the color choice experiment but with one blue male and one carotenoid colored male. Studies of guppies in their natural habitat show that males present a courtship display and are smaller and more colorful than females, thus we expect the female to choose the males and will select for the larger, more carotenoid-colored males.

## **24. College Student's Electronic Replacement Propensity: The When, How and Why**

Lindsay Bertolino (Dept. of Marketing), MSU Mankato

*Kristin Scott, Faculty Mentor (Dept. of Marketing), MSU Mankato*

With technology advancing rapidly, electronic usage and disposal are increasing at alarming rates. Due to toxins located within electronic devices, disposal of such devices could create a damaging impact on the

environment. Because of this potential negative consequence, it would be beneficial to encourage consumers to keep their products as long as possible before disposal and then dispose of them in a sustainable manner. To accomplish this, researchers must understand what influences the life-span and disposal of electronic products. This study aims to investigate this question by measuring electronic replacement propensity and the factors that influence it. Specifically, the study aims to answer the questions: How long do students expect their electronic products to last? What influences them to dispose of them? And how do they dispose of their electronic products? To examine these questions, an on-line survey was developed and administered through Survey Monkey to 80 MNSU students. Survey questions included both open-ended and Likert scale to measure replacement propensity, frugality, product life-span expectations, and demographics. Results show that the median product life span expectations are as follows: cell phones- 2 years, televisions- 8 years, MP3 Players-5 years, and computers-5 years. The data collected also shows a negative correlation between a student's frugality and their replacement propensity in addition to a negative correlation between a student's stewardship and their replacement propensity. These results will help researchers better understand college student's motives for replacing their electronic devices and how often they do so.

## **25. The Effects of Atmospheric Carbon dioxide Levels on Plant-Herbivore Interactions**

Brittany Beers (Dept. of Biosciences), MSU Moorhead

Amy Moorhouse (Dept. of Biosciences), MSU Moorhead

*Alison Wallace, Faculty Mentor (Dept. of Biosciences), MSU Moorhead*

Carbon dioxide levels in the atmosphere are changing and in response, plant-insect interactions are changing too. Plants and insects interact and benefit each other, as well as the ecosystem they live in. As CO<sub>2</sub> concentrations increase, plants may be able to photosynthesize more, which would allow them to grow and develop more carbon-rich tissues. The quality of these plant tissues, based on available nutrients can affect herbivory rates, which can then affect interactions throughout the food chain. Our hypothesis is that the Carbon-to-Nitrogen ratios will increase in the elevated CO<sub>2</sub> levels, thus resulting in higher herbivore consumption and slower larval growth due to a decrease in plant tissue quality. In our experiment, Brassica rapa, Wisconsin Fast Plants, were grown alone in different carbon dioxide levels, and with Pieris brassicae, Cabbage White Butterfly, larvae. The carbon dioxide levels represent current and predicted atmospheric levels. The consumption rates and biomass growth rates of the larvae and the surface areas of the plant foliage were measured. Data concerning the Carbon-to-Nitrogen ratios in the plant foliage are still to be collected and all of the results will be shared at the Student Academic Conference.

## **26. Sociability with a Splash**

Amanda Lilla (Dept. of Recreation, Tourism & Therapeutic Recreation), Winona State University

Jillian Rudar (Dept. of Recreation, Tourism & Therapeutic Recreation), Winona State University

Kalli Tuma (Dept. of Recreation, Tourism & Therapeutic Recreation), Winona State University

*B. Aybar Damali, Faculty Mentor (Dept. of Recreation, Tourism & Therapeutic Recreation), Winona State University*

The sociability of a place is an occurrence that most individuals experience daily. Due to the regularity of [sociability] throughout our day-to-day life, I felt it necessary to investigate more. The purpose of this

study was to explore sociability in the city of Winona in a particular social setting. Specifically, the types of people that use the Bob Welch Aquatic Center as well as their reasoning for attending, which they choose to attend with, and which features are utilized while they are there. An online survey was distributed to residents and non-residents who use Winona Parks and Recreation's services. A survey was sent out to 2,500 people in the database that utilize the Winona Parks and Recreation Dept. (including but not limited to services, programs, facilities, rentals, etc. in the past two years), including non-residents and residents eighteen years of age or older. People who completed the survey range from the age of eighteen to seventy. Majority of the participants were female (80.3%) versus male (19.7%). Marital status was also a demographic question asked, 69.5% were married and living together, many of the responses received about the Bob Welch Aquatic Center answers had to do with their children/family. With the results from the survey numerous participants were able to respond to the questions and tell some of their own thoughts for some questions. The results vary with information from age/demographics, frequency of use, reasons they attend, and the form of payment used to use this facility. Some surprising responses were for the question "Why do you visit the Aquatic Center?" One of the responses to the question was *to meet new people* zero participants picked it, the highest two responses were *swimming lessons, water aerobics, diving programs* (33.8%) and *free swimming* (42.9%). These results were fitting with demographics of the people that had taken the survey. Many of the results focusing on family orientated responses; it was clear to tell that many of the people who utilize the Bob Welch Aquatic Center are family oriented.

## **27. Impact on the Setting Time and Strength of Concrete While Using a Coloring Agent**

Khondoker Ashif (Dept. of Civil Engineering), MSU Mankato

*Farhad Reza, Faculty Mentor (Dept. of Civil Engineering), MSU Mankato*

Concrete has been one of the most important materials used in constructing the built environment since ancient times. It is widely used to build foundations, architectural structures, roads, pavements, walls, bridges, pipes, runways and even concrete canoes. Traditionally, concrete structures have a dull gray color but in recent years there has been an increased use of colored concrete for architecture or as safety measures such as colored concrete crosswalks for pedestrians. The addition of a coloring pigment can affect properties of the concrete mixture and a poor understanding of this effect can result in low quality non-durable products. The objective of this research was to study the effect of adding a coloring agent in a concrete mixture on its setting time at different ambient temperatures, slump, air-entrainment and compressive strength. The process to determine the setting time followed the ASTM standard C403 for penetration resistance. Compressive strength tests were performed on concrete cylinders at 7 days, 14 days and 28 days. The temperatures for the setting time tests were 40o F, 70o F and 100o F to simulate conditions for winter, fall and summer temperatures. The colored concrete exhibited faster setting time and less compressive strength than the reference concrete. Results of the project will be beneficial to designers and contractors to determine the length of time that can be allowed for a colored concrete mixture from the time it is initially mixed to the time it is placed and finished. The results can also be predictors of its long-term performance.

## **28. Sociability of the Winona Public Library**

John IV Haldeman (Dept. of Recreation, Tourism & Therapeutic Recreation), Winona State University

Chelsea Hawkridge (Dept. of Recreation, Tourism & Therapeutic Recreation), Winona State University

Tom Lepke (Dept. of Recreation, Tourism & Therapeutic Recreation), Winona State University

Jenny Schuler (Dept. of Recreation, Tourism & Therapeutic Recreation), Winona State University

*B. Aybar Damali, Faculty Mentor ( Dept. of Recreation, Tourism & Therapeutic Recreation), Winona State University*

Many factors can influence people in their decisions to use a public place, a service, or a facility. Literature suggests that (Public Places, 2012), there are at least four criteria (i.e. activity, accessibility, comfort, and sociability) that help people judge whether a place is “good” or “bad”. This study was conducted to explore “sociability” quality of a public place: public library. The major research question was: Can a public library be a place where people would meet with friends? Specifically, we focused on frequency and duration of usage, type of media used, activities users participated in, and examined how responses were related to respondents’ age, gender, marital status, and physical location of residence. One hundred and sixty five usable evaluations were received from people who have utilized programs and resources of City Park and recreation Dept. within the last two years. The data was collected via online survey instrument. This survey was a section of a comprehensive survey focusing on various public places in the same city. Surveying ran from January 2012 until February 2012. The majority of the respondents were female (n=162, 80.3%) and married (70%). The results showed that checking out materials for use at another location was the major reason for visiting the library (reported by 91%). In addition, when the respondents were provided five different types of activities they could do at the library and asked to indicate what activities they participated in, “quiet/alone time” and “children’s programs” were found to be the dominant responses (61%, 45%). Activity specific analysis is beyond the scope of this evaluation, but the findings help start conversations regarding sociability qualities of public libraries, and current program offerings at the library.

## **29. Effects of Flocculent on Storm Water Sediment Detention**

Jerry Schimmel (Dept. of Civil Engineering), MSU Mankato

Chase Radue (Dept. of Civil Engineering), MSU Mankato

Nripendra Bastola (Dept. of Civil Engineering), MSU Mankato

Hyunjung Lee (Dept. of Civil Engineering), MSU Mankato

Akinola Asaolu (Dept. of Civil Engineering), MSU Mankato

*Stephen Druschel, Faculty Mentor (Dept. of Civil Engineering), MSU Mankato*

Pollutants slowly build up on the surface of the earth either through direct human action, or natural processes. Our main concern in this research is where the pollutants go after a significant rain event. Much of the time they are washed to a creek or a stream where they remain in suspended solution until the solution runs into a detention pond. Here, they are supposed to be filtered out of the water column before flowing into the major bodies of water we rely on for drinking water and recreation. During heavy rainfall, the detention ponds do not work as they should, and the water has no time to let gravity alone

work effectively against the pollutants. We suggest during peak rain events, injecting a flocculent into the water before the detention pond to effectively settle out pollutants. This could essentially be used to improve the clarity and quality of the source water we use for drinking and recreation, and reduce the cost of treatment; at the same time improving the ecology of the water, enhancing the enjoyment of fishing, swimming, canoeing, etc. Our method will involve collecting soil samples from all over Minnesota, getting as diverse of samples as possible. In 1000mL-graduated cylinders, we will mix the sample well with water, and allow only gravity to settle it out of the control. We will then test different concentrations of multiple commercially available flocculants in two more graduated cylinders, one of them having had the pH balanced before treatment. If implemented correctly under real world conditions, we expect flocculent to be very useful in settling out suspended pollutants in storm water run-off. Our research could be used as a jumping off point for individuals concerned with pollutants in run-off water, to help with implementation and correct dosage of storm water.

### **30. “Now Hear This”**

Maria Lendobeja (Dept. of Speech, Language & Hearing Science), MSU Moorhead

*Mary Drake, Faculty Mentor (Dept. of Speech, Language & Hearing Science), MSU Moorhead*

Few studies chart the noise exposure a musician experiences in a typical week of music rehearsals and private instrumental practice within the university setting. It is known, however, that over a prolonged period, exposure to high-intensity sound can place the musician at risk for developing hearing loss (Chesky, 2006). Many music majors are not aware of the risks placed on their hearing due to high decibel exposure and the overall potential long-term effects. This project involves looking at the potential exposure for a student musician through direct measurement and literature review. In addition, a hearing conservation program specific to student musicians will be addressed.

### **31. Before and After: Eye Highlight and Contour**

Sia Lor (Theatre Program), Southwest MSU

*Sheila Tabaka, Faculty Mentor (Theatre Program), Southwest MSU*

Visibly reshape, enhance, add depth or emphasize the natural contours of the eye area using only two makeup products. Highlight and shadowing the eye area in a multi-tonal neutral range can be used to achieve this effect.

### **32. Photometric Observations Conducted at Paul P Feder Observatory**

Shouvik Bhattacharya (Dept. of Physics and Astronomy), MSU Moorhead

*Linda Winkler, Faculty Mentor (Dept. of Physics and Astronomy), MSU Moorhead*

We were involved in research at Paul P Feder Observatory in Fall 2011 and Spring 2012. Data was taken from stellar light curves obtained via the telescope and analyzed collectively. The results can be used in determining the motion and other properties of the stellar objects.

## Economics

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- 1. An Analysis of the Market Reforms and Their Impact on the Foreign Trade and Capital Inflow in Former Soviet Union Countries**  
Gulmira Fazilova (Dept. of Economics), MSU Mankato  
*Ihsuan Li, Faculty Mentor (Dept. of Economics), MSU Mankato*
  
- 2. Red Clover in the Red River Valley**  
Amber Wolbeck (Dept. of Economics), MSU Moorhead  
*Tonya Hansen, Faculty Mentor (Dept. of Economics), MSU Moorhead*
  
- 3. Importance of Being First: First Generation College Students and Academic Achievement**  
Wen Lian (Dept. of Economics), St. Cloud State University  
*Rebeck Kenneth, Faculty Mentor (Dept. of Economics), St. Cloud State University*
  
- 4. To Stay or Not to Stay: Labor Markets and International Students & Propensity to Stay in the United States**  
Lu Zeqing (Dept. of Economics), St. Cloud State University  
*Kenneth Rebeck, Faculty Mentor, (Dept. of Economics), St. Cloud State University*

**1. An Analysis of the Market Reforms and Their Impact on the Foreign Trade and Capital Inflow in Former Soviet Union Countries**

Gulmira Fazilova (Dept. of Economics), MSU Mankato

*Ihsuan Li, Faculty Mentor (Dept. of Economics), MSU Mankato*

The period of 1985 - 1990 for Former Soviet Union is characterized by macroeconomic chaos, fiscal crisis, repressed inflation and balance of payment deficits. Failure of the old centralized socialist economic system in balancing aggregate supply and aggregate demand, conducting international trade and implementing efficient fiscal and monetary policies resulted in its dissolution and formation of 15 new sovereign countries in Eastern Europe and Central Asia. This paper analyzes and provides an overview of post - soviet transitioning economies and highlights the impact of market reforms, such as liberalization of prices and trade, sharp reduction of budget deficits, strict monetary policy and massive privatization, on the foreign trade and capital inflow in Former Soviet Union countries. The study uses statistical tests to examine the effect of such policies by contrasting the pre - independence economy of transitioning countries to post - independence economic environment. Later it assesses the economic goals of these countries and given the findings, focuses on the significance of international trade and foreign capital investment in achievement of better economic performance.

**2. Red Clover in the Red River Valley**

Amber Wolbeck (Dept. of Economics), MSU Moorhead

*Tonya Hansen, Faculty Mentor (Dept. of Economics), MSU Moorhead*

Competing interests related to agricultural profitability and environmental management have resulted in a growing body of literature on the use of cover crops. In particular, red clover has been the focus of a number of those studies. The primary reason for concentrating on red clover is due to its ability to fix nitrogen into the soil. Despite recent studies, the literature has failed to address the long and short run economic impacts to the farming operations of planting cover crops. Further, while crop budgets of a conventional nature are prevalent, budgets recognizing cover crops are limited. Budgets recognizing cover crops will be constructed based on North Dakota State University crop budgets with adaptations made for the use of cover crops and common rotations used in the Red River valley area. A sensitivity analysis based on these budgets will determine the profitability of incorporating red clover into the rotation as a cover crop with wheat.

**3. Importance of Being First: First Generation College Students and Academic Achievement**

Wen Lian (Dept. of Economics), St. Cloud State University

*Kenneth Rebeck, Faculty Mentor (Dept. of Economics), St. Cloud State University*

First generation college students face numerous unique challenges in college. These obstacles may have a negative effect on academic achievement. The purpose of this study is to examine whether first generation college students perform academically on par with the non-first generation college students. This study fills a gap that St. Cloud State University has not used any scientific method or empirical model to predicting the academic achievement for first generation college students. The dataset being used consists of information on all the students who have been admitted in last six years, from fall 2006 to spring 2011.



No student names or ID numbers are included in this dataset, to ensure student data privacy. The method used to test the author's hypothesis is the Ordinary Least Squares regression. Final results from this research indicate that first-generation college students are performing no worse than their counterpart in St. Cloud State University. A number of important relationship and implications for future research are discussed.

#### **4. To Stay or Not to Stay: Labor Markets and International Students & Rsquo; Propensity to Stay in the United States**

Lu Zeqing (Dept. of Economics), St. Cloud State University

*Kenneth Rebeck, Faculty Mentor, (Dept. of Economics), St. Cloud State University*

The growing number of international students has the potential to play an important role in the United States. Their spending boosts the U.S. economy, their skills improve the science and technological development, and their diverse background enriches American culture. Furthermore, many international students become immigrants to the United States. Promising job markets are attractive to those who intend to apply college learning to real-world settings in the United States. I examined international students' propensity to stay in the United States after graduating by analyzing the findings of a survey sent to all international students at St. Cloud State University (SCSU) during fall 2011. This research used a scientific method and empirical model to contribute to the literature by investigating the intentions of international students who study a variety of subjects at SCSU, including non-degree, undergraduate, and graduate students. Applying a binary logistic model, this study finds that the strength of the U.S. job market is one of the main determinants of a student's propensity to stay. The strong job markets in either the United State or the student's home country are likely to influence international students' choices, especially if they value career goals. Having siblings living in America and a higher GPA produces a positive impact on inclination to stay, and family-owned businesses in their home countries have a negative impact on their decision to stay. The findings of this study provide an understanding for faculty and staff of how to manage international students' intentions to stay in the United States after graduating. Additionally, companies can extend their advertisements and provide incentive packages to attract high skilled international students.



## Social Science, Sociology

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- 1. Saints, Sinners, and Suffering: An Analysis of the Medieval Church's View Towards the Disabled**  
Joshua Straub (History Program), Southwest MSU  
*Jeffrey Kolnick, Faculty Mentor (History Program), Southwest MSU*
  
- 2. Identity Formation and Emotion Management Strategies of Mother**  
Annakeiko Reichel (Dept. of Sociology), MSU Mankato  
*Emily Boyd, Faculty Mentor (Dept. of Sociology), MSU Mankato*
  
- 3. A Closer Look at the Residential Foster Care System**  
Crystal Smith (Dept. of Sociology), MSU Moorhead  
*Deborah White, Faculty Mentor (Dept. of Sociology), MSU Moorhead*
  
- 4. Outcast by Class, Economic Status, and Interaction with the Mentally Ill**  
Zachary Toliver (Dept. of Sociology), MSU Moorhead  
*Susan Humphers-Ginther, Faculty Mentor (Dept. of Sociology), MSU Moorhead*

**1. Saints, Sinners, and Suffering: An Analysis of the Medieval Church's View Towards the Disabled**

Joshua Straub (History Program), Southwest MSU

*Jeffrey Kolnick, Faculty Mentor (History Program), Southwest MSU*

Saints, Sinners, and Suffering: A Medieval View of the Disabled attempts to concisely state the position of the Catholic Church regarding the issue of disability in the early Medieval Age, ending with the Papacy of Gregory IX around 1200. It challenges the view that has become common place that the disabled were always viewed as inherently sinful by the Catholic Church. Using secondary sources, such as Irina Metzler's *Disability in Medieval Europe* and primary sources such as *Jerome's Commentary on Mathew* and the *Homilies of Bede*, we learn that attitudes towards the disabled were not in fact monolithic but oscillated back and forth between multiple views until Gregory IX's Papal bulls which removed many of the prohibitions against disability in the priesthood which in turn helped give the Church a cohesive position on the question. The reality is that before this change in Canon Law there were elements inside the Church that saw the disabled as inherently more sinful. This arose from a reading of the Church Father's that consisted almost completely of the writings of St Jerome. But there were other Church Father's that taught that the disabled were not inherently more sinful. Indeed this was by far the more prevalent view.

**2. Identity Formation and Emotion Management Strategies of Mother**

Annakeiko Reichel (Dept. of Sociology), MSU Mankato

*Emily Boyd, Faculty Mentor (Dept. of Sociology), MSU Mankato*

When a woman becomes a mother it is arguably one of the most life changing and defining moments of their lives. It is evident that the social world assumes mothers will automatically adjust to the role of being a mom without asking questions such as, what are the challenges moms face after having children? Or, how is a mother's identity shaped after having children, while adjusting to the role as mom? I became motivated to research this topic because, as a mother myself, I recognize the covert difficulties of one's identity changing after becoming a mother. To investigate emotion management and identity transitions of mothers, I conducted five semi-structured qualitative interviews with young mothers in Minnesota using the Grounded Theory method (Charmaz 2006). I transcribed and coded each interview and wrote thorough analytical memos, which helped in writing my final analysis. The most important finding in my study is that moms are constantly negotiating and projecting a perfected identity in an effort to assimilate to the idealized version of what a mom "should" be in the social world. Specifically, I found they do this while interacting with other moms in their friendship networks as well as through online sources such as Facebook. Thus, moms are actively manipulating their presentation of self through social media websites and interactions with their peers. In conclusion, being a mom is a difficult process and these difficulties are clearly exacerbated by society's portrayal of the ideal version of a mom.

### **3. A Closer Look at the Residential Foster Care System**

Crystal Smith (Dept. of Sociology), MSU Moorhead

*Deborah White, Faculty Mentor (Dept. of Sociology), MSU Moorhead*

People with mental and behavioral disabilities are sometimes unable to care for themselves, and may be placed in care facilities, such as a mental hospital or a residential foster care system. The goals of deinstitutionalization (i.e. placement in residential foster care systems) are to provide optimum care for the clients, and to prepare them for independent living. This presentation will focus on the quality of care for clients within the residential foster care system, the effects on their well-being and progress, and whether it is overall detrimental or supportive for a future in independent living.

### **4. Outcast by Class, Economic Status, and Interaction with the Mentally Ill**

Zachary Toliver (Dept. of Sociology), MSU Moorhead

*Susan Humphers-Ginther, Faculty Mentor (Dept. of Sociology), MSU Moorhead*

Many people, rich or poor, suffer from mental illness in the United States. However, when it comes to perception of the mentally ill, recognizing “odd” behavior, or knowing those with the illness, how much is tied to socioeconomic status? In essence, social class status can potentially influence who “sees” the mentally ill. Much research has shown our class status influences our social experience and heavily constructs the social environments we live within. These environments come with expectations of normative behavior, common characters, and certain situations all of which can shed light on the frequency of interaction or observation of the mentally ill. Through quantitative survey research, we can start to recognize certain trends. More interaction and more positive reactions with the mentally ill are done in lower class environments. Yet higher economic classes know more people who have received treatment for mental illness perhaps due to their elevated possibility of healthcare coverage. It is medically significant to understand which class interacts with the mentally ill more for it will help society with outreaching to those most in need of medical assistance. Furthermore, it is dire to understand social classes’ perceptions of the mentally ill to fuel positive interactions and influence healthier assistance to those suffering from mental illness.



## Biology, Geology, Geography

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- 1. Commercialization of Medicinal Plants in the Peruvian Amazon**  
Jose Barriga (Dept. of Biology), MSU Mankato  
*Timothy Secott, Faculty Mentor (Dept. of Biology), MSU Mankato*
  
- 2. Development of Immunological Assays for the Fathead Minnow (*Pimephales promelas*), a Model Species of Aquatic Toxicology**  
Kelsey Lesteborg (Dept. of Biological Sciences), St. Cloud State University  
*Heiko Schoenfuss, Faculty Mentor (Dept. of Biological Sciences), St. Cloud State University*  
*Marina Cetkovic-Cvrlje, Faculty Mentor (Dept. of Biological Sciences), St. Cloud State University*
  
- 3. Oxidation and Fluid Influence in the Mesabi Iron Range: The Search for High- Grade Ore**  
Ryan Rague (Dept. of Geology), MSU Mankato  
*Steven Losh, Faculty Mentor (Dept. of Geology), MSU Mankato*
  
- 4. Coldwater Spring Contested: American Wilderness and Imperialism within a Dakota Homeland**  
Kelsey Carlson (Dept. of Geography), St. Cloud State University  
*Jeffrey Torguson, Faculty Mentor (Dept. of Geography), St. Cloud State University*  
*Mikhail Blinnikov, Faculty Mentor (Dept. of Geography), St. Cloud State University*  
*Kelly Branam, Faculty Mentor (Dept. of Geography), St. Cloud State University*  
*Darlene St Clair, Faculty Mentor (Dept. of Geography), St. Cloud State University*
  
- 5. Design a Power Substation for Essar Steel Minnesota**  
Jeremy Goodell (Dept. of Integrated Engineering), MSU Mankato  
Daniel Marshall (Dept. of Integrated Engineering), MSU Mankato  
Cord Semotink (Dept. of Integrated Engineering), MSU Mankato  
*Mohammad Habibi, Faculty Mentor (Dept. of Integrated Engineering), MSU Mankato*

**1. Commercialization of Medicinal Plants in the Peruvian Amazon**

Jose Barriga (Dept. of Biology), MSU Mankato

*Timothy Secott, Faculty Mentor (Dept. of Biology), MSU Mankato*

The Peruvian city of Iquitos is found in the western portion of the Amazon basin, where the majority of people rely on forest products for their health needs. People of and around the city of Iquitos have been involved in the global trade of medicinal plants long before the rubber boom that started in the late 1800s. As a result of the high worldwide demand for rubber (during the late 1800s and early 1900s), thousands of immigrants from around the globe were attracted to Iquitos. This led to a blending of beliefs and ways of living, both strongly tied to nature. The present project analyzes the current commercialization process of medicinal natural products, including the profitability, knowledge and quality of the products in the socioeconomic context of Iquitos. In that means, the results were compared to the contexts of Cuzco (Peru) and La Paz (Bolivia), where the products from Iquitos are commercialized as well. To accomplish this, semi-structured interviews were conducted between December 2011 and January 2012. Results suggest that there is a lack of balance of profitability between people who harvest the products and people who sell the products to the public. Additionally, the farther the products get from Iquitos, the lesser the quality and purity of the products and the higher the costs.

**2. Development of Immunological Assays for the Fathead Minnow (*Pimephales Promelas*), a Model Species of Aquatic Toxicology**

Kelsey Lesteborg (Dept. of Biological Sciences), St. Cloud State University

*Heiko Schoenfuss, Faculty Mentor (Dept. of Biological Sciences), St. Cloud State University*

*Marina Cetkovic-Cvrlje, Faculty Mentor (Dept. of Biological Sciences), St. Cloud State University*

The presence of pollutants in the aquatic environment is of growing concern. Recent studies suggest that in addition to well established histopathologic, reproductive, and behavioral effects, certain aquatic contaminants may act as immunosuppressants. A loss of functional T and B lymphocytes may be responsible for this suppression. Small fish species, such as the fathead minnow (*Pimephales promelas*), are often used as bioindicators for pollutants. However, there are no established protocols or reagents available for quantifying the immune response in this model. In an attempt to address this issue, we tested 11 antibodies (2  $\alpha$ -flounder IgM antibodies, 3  $\alpha$ -trout IgM antibodies,  $\alpha$ -trout IgD,  $\alpha$ -striped bass light chain,  $\alpha$ -CD3,  $\alpha$ -CTLA4,  $\alpha$ -LCK, and  $\alpha$ -CD11) obtained from the Veterinary Immunology Network for their efficacy in flow cytometric analysis of fathead minnow lymphocytes. Lymphocytes were obtained from the spleen and anterior head kidney of 110 fathead minnows and tested against each antibody (10 fish per antibody). Positive flow cytometric staining was observed with two antibodies:  $\alpha$ -CD3 and  $\alpha$ -striped bass light chain, which can be used to quantify T lymphocytes and B lymphocytes respectively. In order to test the functional capacity of fathead minnow T and B lymphocytes, we will next determine the proliferative capacity of three mitogens—Concanavalin A (ConA), Lipopolysaccharide (LPS), and Phytohaemagglutinin (PHA) on these cells. Lymphocytes will be isolated from the spleens of 20 fish and cultured with Con A (1-10  $\mu$ g/mL), LPS (1-40  $\mu$ g/mL), or PHA (1-20  $\mu$ g/mL). Proliferation will be measured by Alamar Blue test post exposure to mitogens for 3-6 days. Development of these immunological assays will greatly augment our understanding of the consequences of aquatic pollution on exposed organisms.



### 3. **Oxidation and Fluid Influence in the Mesabi Iron Range: The Search for High- Grade Ore**

Ryan Rague (Dept. of Geology), MSU Mankato

*Steven Losh, Faculty Mentor (Dept. of Geology), MSU Mankato*

For over a century, the 1.85-billion year old iron-rich sedimentary rocks of the Mesabi Iron Range of Northern Minnesota have been a major resource of high-grade iron ore to the United States. High-grade iron ore in the Mesabi Range resulted from fluids dissolving soluble minerals from the iron formation at some time in the past, before the rocks became exposed at the Earth's surface by erosion. If these fluids had derived from the subsurface, there could be more high-grade ore at greater depths within the range. Mineral assemblages and oxidation trends within iron range samples will help determine the cause of high-grade iron ore deposition. To determine the possibility that the fluids responsible for high-grade ore flowed up from below, fluid inclusion and SEM analysis was performed on iron formation samples. Fluid inclusions are microscopic bubbles of fluid trapped in minerals as they precipitated from hot water and that, when heated or frozen under the microscope, indicate the temperature and salinity of the fluid. Scanning Electron Microscope imagery is useful in studying the interaction of mineral assemblages. Magnetite and Hematite interaction in altered rocks indicates that subsurface fluids may be directly linked to the deposition and oxidation of high-grade iron ore. From my information, it appears that there is influence between faults containing quartz and calcite veins in respect to Hematite and Magnetite grains within high-grade iron ore. Average fluid inclusion temperature and salinity is indicative of fluids of non-meteoritic sources, within or below the Mesabi Iron Range.

### 4. **Coldwater Spring Contested: American Wilderness and Imperialism within a Dakota Homeland**

Kelsey Carlson (Dept. of Geography), St. Cloud State University

*Jeffrey Torguson, Faculty Mentor (Dept. of Geography), St. Cloud State University*

*Mikhail Blinnikov, Faculty Mentor (Dept. of Geography), St. Cloud State University*

*Kelly Branam, Faculty Mentor (Dept. of Geography), St. Cloud State University*

*Darlene St Clair, Faculty Mentor (Dept. of Geography), St. Cloud State University*

Coldwater Spring, or the Coldwater unit of the Mississippi National River and Recreation Area (MNRRA), is a 27-acre portion of land contained within the Twin Cities Metro region of Minnesota. It has recently been acquired by the National Park Service (NPS) and is currently being "restored." The primary goal of the NPS is to make the site accessible as a public park. However, Coldwater Spring is part of a larger sacred landscape known to Dakota people as Bdote. Constructivist theory in political ecology states that parks and wilderness areas are social (human) constructs. Specifically, the social construction of the wilderness idea has evolved over centuries of "western" philosophical tradition. This presentation examines the extent to which the National Park Service has employed these discourses within the context of the restoration of Coldwater Spring. In addition, it examines how Dakota people perceive and interact with these discourses in response to the transition of Coldwater Spring to a public park. Analyzing these constructs and the subsequent perceptions and interactions of stakeholders with the site will determine the extent to which park discourses and the subsequent land management decisions limits access to or exclude Native people from their sacred landscapes.

## **5. Design a Power Substation for Essar Steel Minnesota**

Jeremy Goodell (Dept. of Integrated Engineering), MSU Mankato

Daniel Marshall (Dept. of Integrated Engineering), MSU Mankato

Cord Semotink (Dept. of Integrated Engineering), MSU Mankato

*Mohammad Habibi, Faculty Mentor (Dept. of Integrated Engineering), MSU Mankato*

Power substations are the important sections of any industry. Substations may be categorized as distribution, transmission, switching, or any combination thereof. In this multidisciplinary engineering project, which was offered by Essar Steel Minnesota, we designed a distribution power substation. A distribution substation is a combination of switching, controlling, and voltage step-down equipment arranged to reduce voltage to primary distribution voltage for different applications such as high power variable frequency drives. In this design, we investigated a number of engineering considerations such as building foundation, structure, building material, physical layout, grounding, equipment selection, cable trays, power fault analysis, safety, code and regulation. This substation will house approximately 20 medium voltage circuit breakers/switch gears, 9 transformers, and 7 medium voltage variable frequency drive units. Engineering safety analysis was performed to ensure that our design follows all codes and regulations.

## Art 1

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- 1. Modern Mosques of the Midwest; Examining Identity of Regional Mosques**  
Kathryn Carrier (Dept. of Art), *MSU Mankato*  
*Alisa Eimen, Faculty Mentor (Dept. of Art), MSU Mankato*
  
- 2. From Runway to Museum: Creating Successful Exhibitions Showing the Interrelationship Between Fashion and Art**  
Erica Kroening, Dept. of Art, MSU Mankato  
*Curt Germundson, Faculty Mentor (Dept. of Art), MSU Mankato*
  
- 3. Orientalism in Colonial Postcard Art**  
Lisa Phillips (Dept. of Art), *MSU Mankato*  
*Alisa Eimen, Faculty Mentor (Dept. of Art), MSU Mankato*
  
- 4. Portrait of Aging**  
Jelena Bulajic (Dept. of Art), MSU Mankato  
*Brian Frink, Faculty Mentor (Dept. of Art), MSU Mankato*  
*Gina Wenger, Faculty Mentor (Dept. of Art), MSU Mankato*

**1. Modern Mosques of the Midwest; Examining Identity of Regional Mosques**

Kathryn Carrier (Dept. of Art), *MSU Mankato*

*Alisa Eimen, Faculty Mentor (Dept. of Art), MSU Mankato*

Through academic and hands-on research, this study investigates how identity is expressed architecturally at Midwestern Muslim centers in Minnesota, Wisconsin, and Chicago. This research considers the kinds of identities that regional mosques are representing in the twenty-first century, at a time when religious identities seem to be increasingly politicized. Questions that are important in the analysis of the selected mosques' identities are: What identities are being represented and how? What services does the structure offer? In what ways does the structure communicate beyond its congregation? And, finally, how does the structure fit into fourteen centuries of mosque building? Published research of mosques in the traditionally conceived Islamic world shows that cultural and religious identity is often reflected in buildings' form and design. Because of that, after in-depth analysis, particular strategies and motifs in identity formations are apparent. The selected regions of research have similarities yet express differences supporting various identities through architecture. Acknowledging and understanding differences in identity is important because Islam can seem to be a very foreign religion. Through my research, I attempt to clarify how the structures meet both sacred and community services, functioning just like sacred spaces in other religious traditions. Important regional variations represent the rich diversity that exists in Islamic practice and indicate, most importantly, its adaptability based on the location of its community.

**2. From Runway to Museum: Creating Successful Exhibitions Showing the Interrelationship Between Fashion and Art**

Erica Kroening, Dept. of Art, MSU Mankato

*Curt Germundson, Faculty Mentor (Dept. of Art), MSU Mankato*

Historically, the average person has reduced high-end fashion to ideas of materialism and functionality. What has commonly been overlooked on the runways of New York, Paris, and Milan was the idea of fashion as an object of art. Some designers, artists, and art historians have always given fashion the warranted classification as art, but the regular museum visitor does not yet accept this concept. This paper focuses on three fashion exhibitions that show when a designer's inspiration and vision is successfully translated into a museum setting, it encourages the visitor to see the interrelationship between fashion and art. I visited the following exhibitions for research: "Scaasi: American Couturier" at the Museum of Fine Arts in Boston, "Roberto Capucci: Art into Fashion" at the Philadelphia Museum of Art in Philadelphia, and "Alexander McQueen: Savage Beauty" at The Metropolitan Museum of Art in New York City. These exhibitions deal with designer-artists who transcend the conventional line between fashion and art. Exhibiting fashion is relatively contemporary, and there are challenges involved with translating the designer's pieces. After thorough research, I have concluded that displaying these fashion pieces in a museum is difficult, for they rely so heavily on movement, contours of the body, and the designer's inspiration from the workroom to the runway. It is a challenge that when overcome by remaining true to the context of the designer's vision, from the initial design to the runway show, encourages the museum visitor to expand his/her definition of art to include fashion.

### **3. Orientalism in Colonial Postcard Art**

Lisa Phillips (Dept. of Art), *MSU Mankato*

*Alisa Eimen, Faculty Mentor (Dept. of Art), MSU Mankato*

This paper will cover the use of orientalism and exoticism in the postcard art of the late 1800's and early 1900's. It briefly covers the etiology of orientalism due to the rise of tourism following the colonialization of the East by the European powers. I will do this by using examples of postcards and address specific issues related to this subject. Some of these issues are racism and other prejudices and cultural misconceptions. Also I will touch upon the use of double standards, which become clearer when studying the art of the aforementioned postcards.

### **4. Portrait of Aging**

Jelena Bulajic (Dept. of Art), *MSU Mankato*

*Brian Frink, Faculty Mentor (Dept. of Art), MSU Mankato*

*Gina Wenger, Faculty Mentor (Dept. of Art), MSU Mankato*

My creative project raises attention to elderly people as a marginalized group by displaying the faces of individuals in a public space; they are people who are highly unlikely to ever leave the place at which they are situated. My grand scale drawings are aimed to extract the elderly from their residences and bring them into the gallery or a public space where their existence would be perceptible and noted, and where it could, in a sense, communicate with the audience. The people whom I portrayed in my drawings are the residents of nursing homes in Mankato: tenants of Laurels Edge and Laurels Peak. I created three 106.3 x 78.7" drawings, realistic in their execution, while working on them in the Nelson Hall painting studio. My project, apart from resulting in a presentation at the Undergraduate Research Symposium and exhibition by students of MSU in the CSU Gallery, will further progress upon the completion of my studies at MNSU. I will depart to my home country where I will be exhibiting works created at MSU at 2012 Academy of Arts Annual Exhibition at the Museum of Contemporary Art in Novi Sad, Serbia. Finally, I have the intention of exhibiting these works at the solo exhibition, which I will have in the Royal Capital of Montenegro, Cetinje, in the summer of 2012.



## English, Theatre

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**1. Slam Poetry**

Nick White, (Creative Writing Program), Southwest MSU

*Neil Smith, Faculty Mentor (Creative Writing Program), Southwest MSU*

**2. Fiction Presentation**

Patrick Van Nevel (Creative Writing Program), Southwest MSU

*Neil Smith, Faculty Mentor (Creative Writing Program), Southwest MSU*

**3. Fiction Presentation**

Cheyenne Marco (Creative Writing Program), Southwest MSU

*Neil Smith, Faculty Mentor (Creative Writing Program), Southwest MSU*

**4. Women of Horror**

Andrew Harrison (Dept. of Theatre), MSU Mankato

*Heather Hamilton, Faculty Mentor (Dept. of Theatre), MSU Mankato*

**1. Slam Poetry**

Nick White, (Creative Writing Program), Southwest MSU

*Neil Smith, Faculty Mentor (Creative Writing Program), Southwest MSU*

My spoken word poems involve personal experiences, accounts from my past, and emotions towards a number of people. I do my best to convey what my thoughts were during the writing process through my performance in front of a crowd. All are oral recitations from memory and hopefully pack the punch they were intended to.

**2. Fiction Presentation**

Patrick Van Nevel (Creative Writing Program), Southwest MSU

*Neil Smith, Faculty Mentor (Creative Writing Program), Southwest MSU*

Patrick will be reading a selection of his fiction.

**3. Fiction Presentation**

Cheyenne Marco (Creative Writing Program), Southwest MSU

*Neil Smith, Faculty Mentor (Creative Writing Program), Southwest MSU*

Cheyenne will be reading one of her short stories.

**4. Women of Horror**

Andrew Harrison (Dept. of Theatre), MSU Mankato

*Heather Hamilton, Faculty Mentor (Dept. of Theatre), MSU Mankato*

Horror films have often been labeled as being sexist and objective towards women. The analysts who have postulated on this topic have neglected the evolution of the heroine and even of the killer. The examination of women in horror films provides a new prospective of the role of females in society and their subsequent portrayal in the media. What has been neglected is how gender equality has progressed and translated to horror films. Heroines and female killers have gained in strength, intelligence, and power. This gradual change has a direct correlation with altered status of women in society. In horror films women have gone from men saving them, to defending themselves, to now working alongside men and even having to save the men. One of the side effects of this progression is a change in terminology. The idea of a final girl: the heroine who remains standing at the end of the film. At the time, that was enough. As the films and the heroines have grown, survivor girl and even a survivor couple should be included in the vernacular. This project is a chronological study of the strides that have been made for gender equality, how the political and societal climate affects horror films and vice versa. It reapplies the analysis of horror scholars to account for the current status of women in society. Looking at the horror genre will open a discussion of the advancement of women and the struggle they have gone through to get here.



## History, Philosophy, Political Science

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1. **Progressive Reform: How the National Child Labor Committee Regulated Child Labor in the United States**

Megan Fechner (Dept. of History), Winona State University

*Dr. Matthew Lindaman, Faculty Mentor (Dept. of History), Winona State University*

2. **The Partnership of Respect and Pleasure: Kantian and Utilitarian Ethics**

Jacob Hedlund (Dept. of Philosophy), MSU Moorhead

*Marilea Bramer, Faculty Mentor (Dept. of Philosophy), MSU Moorhead*

3. **Presentation of Annual Spring SCSU Student Survey**

Bikal Kafle (Dept. of Political Science and International Relations), St. Cloud State University

Amanda Kannas (Dept. of Political Science and International Relations), St. Cloud State University

Katie Lahr (Dept. of Political Science and International Relations), St. Cloud State University

Karen Stay (Dept. of Political Science and International Relations), St. Cloud State University

*Sandrine Zerbib, Faculty Mentor (Dept. of Political Science and International Relations), St. Cloud State University*

*Stephen Frank, Faculty Mentor (Dept. of Political Science and International Relations), St. Cloud State University*

*Steven Wagner, Faculty Mentor (Dept. of Political Science and International Relations), St. Cloud State University*

*Michelle Hammes, Faculty Mentor (Dept. of Political Science and International Relations), St. Cloud State University*

*John Kulas, Faculty Mentor (Dept. of Political Science and International Relations), St. Cloud State University*

4. **The Experience of the Witness in the Rwandan Gacaca Courts**

Dylan O'Brien (Dept. of Political Science), MSU Moorhead

*Andrew Conteh, Faculty Mentor (Dept. of Political Science), MSU Moorhead*

**1. Progressive Reform: How the National Child Labor Committee Regulated Child Labor in the United States**

Megan Fechner (Dept. of History), Winona State University

*Dr. Matthew Lindaman, Faculty Mentor (Dept. of History), Winona State University*

Right from the beginning of the twentieth century, the United States faced a new political ideology that favored social, political, and economic reform, which is known as Progressivism. Progressivism influenced many major reforms throughout the nation, yet struggled for years to regulate one labor force, child labor. With many organizations spreading throughout the United States and a new type of journalism there were more demands for action to take place. By looking at a variety of primary and secondary documents I have been able to determine the influence the media had placed on the public and governmental officials. I studied many photographs, newspaper articles, and statistics that were taken about child labor. With my research I have determined how the National Child Labor Committee was able to influence the public and government to finally take action by using muckraking techniques.

**2. The Partnership of Respect and Pleasure: Kantian and Utilitarian Ethics**

Jacob Hedlund (Dept. of Philosophy), MSU Moorhead

*Marilea Bramer, Faculty Mentor (Dept. of Philosophy), MSU Moorhead*

I began this examination to find the most effective way to live morally. Many great thinkers have written extensively on the matter of ethics. I chose two very different philosophers that I felt were heading in the right direction and could benefit from a synthesis. This paper will compare the ethics of John Stuart Mill (1806-1873) and those of Immanuel Kant (1724-1804). I argue that a moral agent should use Kant's theory to construct rules for common situations, when the agent is faced with a peculiar moral dilemma, they should use Mill's theory to produce the best consequences feasible. I flesh out the distinction between common and peculiar situations as well as investigate and appropriate each philosopher's theory. By the end we should see a more effective and comprehensive way to live morally by knowing what holds the most moral weight, during specified situations.

**3. Presentation of Annual Spring SCSU Student Survey**

Bikal Kafle (Dept. of Political Science and International Relations), St. Cloud State University

Amanda Kannas (Dept. of Political Science and International Relations), St. Cloud State University

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*Steven Wagner, Faculty Mentor (Dept. of Political Science and International Relations), St. Cloud State University*

*Michelle Hammes, Faculty Mentor (Dept. of Political Science and International Relations), St. Cloud State University*

*John Kulas, Faculty Mentor (Dept. of Political Science and International Relations), St. Cloud State University*

The Student Directors of the St. Cloud State University Survey will be presenting the results of the spring 2012 SCSU student survey. A brief history of the SCSU Survey, acknowledgment of the staff, and the methodology will also be discussed. Topics of the 2012 survey will be SCSU students' views on the direction of SCSU, the biggest challenges facing SCSU, student safety, student health, student drinking habits, and other topics related to SCSU students. The SCSU Survey has been cited as a major academic survey research organization. It was founded by Dr. Stephen Frank in 1980, who continues to direct it along with Dr. Steven Wagner, Dr. David Robinson, Dr. Michelle Kukoleca Hammes, Dr. Sandrine Zerbib, and Dr. John Kulas. We conduct an annual Fall Statewide Survey of Minnesota adults and a Spring Survey of currently enrolled students at St. Cloud State University.

#### **4. The Experience of the Witness in the Rwandan Gacaca Courts**

Dylan O'Brien (Dept. of Political Science), MSU Moorhead

*Andrew Conteh, Faculty Mentor (Dept. of Political Science), MSU Moorhead*

The Rwandan Genocide of the Tutsi people by the Hutu majority in 1994 was one of the most devastating and shocking events of the late 20<sup>th</sup> century. It left more than one million dead, and many more mourning lost loved ones. The numerous perpetrators of the crimes involved with the Rwandan Genocide have been brought to justice both through the use of western jurisprudence (International Criminal Tribunal for Rwanda in Arusha, Tanzania) and through the use of traditional justice (the Gacaca courts). The Gacaca courts, which are considered to be "grassroots" (traditional) justice and are relatively informal, emphasize the power of community over that of authority. The importance of the Gacaca courts is that they provide the community with a means of trying a large number of the accused fairly inexpensively and quickly. Research on the Gacaca courts has been minimal, and to a large degree, political, rather than focusing upon the qualities of the experiences of its participants. One exception to this is the research done by Dr. Karen Brouneus, a Clinical Psychologist, namely in her articles titled "Truth Telling as a Talking Cure?" Insecurity and Retraumatization in the Rwandan Gacaca Courts (published in 2008), and The Trauma of Truth Telling: Effects of Witnessing in the Rwandan Gacaca Courts (published in 2010).



## Mathematics

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**1. Mathematical Modeling and Optimal Control of Pathogen Dynamics**

Patrick Manfo Paguem (Dept. of Mathematics), MSU Mankato

Tyler Metzger (Dept. of Mathematics), MSU Mankato

Tyler Jones (Dept. of Mathematics), MSU Mankato

*Namyong Lee, Faculty Mentor (Dept. of Mathematics), MSU Mankato*

**2. Statistical Models of Self- Efficacy in Stem Students**

Sarah Painter (Dept. of Mathematics), MSU Mankato

*Rebecca Bates, Faculty Mentor (Dept. of Computer Science), MSU Mankato*

**3. Network Modeling of Social Influences**

Jordan Tait (Dept. of Mathematics), MSU Mankato

*In-Jae Kim, Faculty Mentor (Dept. of Mathematics), MSU Mankato*

**4. Laws and Regulations Surrounding Healthcare: Meaningful Use of HIPAA and EHR**

Lindsay Angove (Dept. of Mathematics and Biology), Metropolitan State University

*Kris Frykman, Faculty Mentor (Dept. of Communication, Writing, and the Arts), Metropolitan State University*

**1. Mathematical Modeling and Optimal Control of Pathogen Dynamics**

Patrick Manfo Pague (Dept. of Mathematics), MSU Mankato

Tyler Metzger (Dept. of Mathematics), MSU Mankato

Tyler Jones (Dept. of Mathematics), MSU Mankato

*Namyong Lee, Faculty Mentor (Dept. of Mathematics), MSU Mankato*

Even with recent improvements, the agricultural production is still highly affected by pathogens. In many agricultural systems, farmers use chemicals to fight against pathogens, which degrade the overall farming production. However, the excessive uses of chemicals create health issues for consumers and environmental problems. In this project, we suggested an alternative way of controlling strategy for pathogen dynamics such that the output of the farming system (food) contributes in the preservation of human health. For this purpose, we adopted various population dynamics models, such as predator-prey model for instance, to understand the interaction between crop and pathogens. In addition, base on our experimental models, we performed optimal control through the Pontryagin's maximum principle. Computer simulations were performed for these mathematical models and the results were analyzed.

**2. Statistical Models of Self- Efficacy in Stem Students**

Sarah Painter (Dept. of Mathematics), MSU Mankato

*Rebecca Bates, Faculty Mentor (Dept. of Computer Science), MSU Mankato*

Persistence through undergraduate education may be explained by self-efficacy. It is the belief in one's self to persevere through challenges. Bandura stated four areas that are thought to influence self-efficacy: mastery experience, social persuasion, vicarious experience, and physiological state. In this study, we focused on general and academic self-efficacy in STEM students, in the hopes of learning more about the relationships between Bandura's categories, demographics, and self-efficacy. Data was taken from two institutions: one, a large research focused university, and the other, a smaller teaching focused university. In the first phase, surveys on general self-efficacy were taken at both institutions by 118 students. In the second, academic self-efficacy data was taken from 599 students. These surveys included questions concerning demographics, Bandura's categories, and self-efficacy. Scores were summed for constructs relating to one of Bandura's four categories. We used Cronbach's alpha as a measure of internal reliability within each of the constructs. Correlation and linear regression analyses were used to study the data. Dummy variables for demographic data were created and used in the regression models. The best current model found for general self-efficacy, including all phase 1 constructs and dummy variables, has an  $r^2$  value of 0.558. For academic self-efficacy, our best model includes all constructs and dummy variables and has an  $r^2$  value of 0.526. The goal of this work is to find factors that may potentially influence self-efficacy, in the hopes that they may be used in further research aimed at ensuring persistence of STEM students.

### **3. Network Modeling of Social Influences**

Jordan Tait (Dept. of Mathematics), MSU Mankato

*In-Jae Kim, Faculty Mentor (Dept. of Mathematics), MSU Mankato*

With the recent advancements in social networking websites such as Facebook and Twitter, it has become imperative to understand how social influences affect the adoption of innovations, ideas, and opinions. In this presentation, we examine how ideas and opinions spread through various network models under two propagation rules. Our main goal is to find the minimum number of initial adopters of an idea which results in complete propagation of the idea through the rest of a social network. We also discuss real-world situations in which we can apply the findings in propagation analysis.

### **4. Laws and Regulations Surrounding Healthcare: Meaningful Use of HIPAA and EHR**

Lindsay Angove (Dept. of Mathematics and Biology), Metropolitan State University

*Kris Frykman, Faculty Mentor (Dept. of Communication, Writing, and the Arts), Metropolitan State University*

In the year 2009 a nationwide healthcare law was implemented to assure patient safety, confidentiality and care effectively; the Health Information Technology for Economic and Clinical Health (HITECH) Act. By utilizing electronic health records during patient visits the government feels the laws of the HITECH Act will provide adequate healthcare practice. Incentives were provided in 2009 by the government to assure that clinics and hospitals were conforming, however many clinics and hospitals today are still lagging behind and using paper charts which denounce the HITECH Act. The government is now implementing the Meaningful Use regulation, a branch off of the 2009 HITECH Act, with incentives being presented to clinics and hospitals. The new regulation requires all healthcare practitioners to ask a series of questions to meet government requirements. The paper will discuss the concerns surrounding the new Meaningful Use regulation from all areas, technology, patients, physicians and government. With each medical field focusing on different physiological systems not all Meaningful Use stages should be required for fulfillment.





**Biological Sciences, Chemistry, Composite Materials Engineering, Earth Sciences, Physics & Astronomy, Psychology, Science, Social Science, Sociology**

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- 1. Eliciting Evidence for False Memories on Explicit and Implicit Memory Tests**  
Farryn Helm (Dept. of Psychology), MSU Moorhead  
*Christine Malone, Faculty Mentor (Dept. of Psychology), MSU Moorhead*
  
- 2. Urban Turkeys: Survey of Wild Turkey Distribution and Numbers, Human Interactions, and Public Opinion in the Red River Valley in Cass (North Dakota) and Clay (Minnesota) Counties (2003-2011)**  
Chelsea Schmaltz (Dept. of Biosciences), MSU Moorhead  
Kara Nygaard (Dept. of Biosciences), MSU Moorhead  
*Donna Stockram, Faculty Mentor (Dept. of Biosciences), MSU Moorhead*
  
- 3. Intuition Overrides Logic When Detecting Deception**  
Colette Baudoin (Dept. of Psychology), MSU Mankato  
Chelsea Schmillen (Dept. of Psychology), MSU Mankato  
*Emily Stark, Faculty Mentor (Dept. of Psychology), MSU Mankato*
  
- 4. Limited Exposure of Monarch Butterfly Populations to Bt-toxin Due to Impotent Dispersal of Corn Pollen**  
Jenae Olson (Dept. of Biosciences), MSU Moorhead  
Kayla Sluka (Dept. of Biosciences), MSU Moorhead  
*Daniel McEwen, Faculty Mentor (Dept. of Biosciences), MSU Moorhead*
  
- 5. Laptops in the Classroom: Evaluating the Potential Benefits of Technology Against Distractions**  
Britten Block (Dept. of Psychology), MSU Mankato  
Ryan Meyer (Dept. of Psychology), MSU Mankato  
Maria Almoite (Dept. of Psychology), MSU Mankato  
Kayla Scott (Dept. of Psychology), MSU Mankato  
*Karla Lassonde, Faculty Mentor (Dept. of Psychology), MSU Mankato*
  
- 6. Effect of Metformin in the Uptake of Glucose and Amino Acids in *L. Acidophilus***  
Balabhadra Khatiwada (Dept. of Chemistry), Winona State University  
*Dr. Myoung E. Lee, Faculty Mentor (Dept. of Chemistry), Winona State University*
  
- 7. In One Ear and Out the Other: The Correction of psychology Misconceptions and Our Minds Resistance to It**  
Samuel Erickson (Dept. of Psychology), MSU Mankato  
Samantha Bergmann (Dept. of Psychology), MSU Mankato  
Sarah Lewer (Dept. of Psychology), MSU Mankato  
*Karla Lassonde, Faculty Mentor (Dept. of Psychology), MSU Mankato*

8. **Estimating the Molecular Volumes of Small Molecules Using IR Spectroscopy**  
 Etsehiwot Gebreselassie (Dept. of Chemistry), MSU Moorhead  
 Samantha Stewart-James (Dept. of Chemistry), MSU Moorhead  
*P. Asoka Marasinghe, Faculty Mentor (Dept. of Chemistry), MSU Moorhead*
  
9. **Detecting Deception: Studying the Cues People Use to Distinguish Between Truth-Tellers and Liars**  
 Amber Schramm (Dept. of Psychology), MSU Mankato  
*Emily Stark, Faculty Mentor (Dept. of Psychology), MSU Mankato*
  
10. **Identification of Metabolic Adducts Formed Between the Common Food Contaminant, HMF, and DNA**  
 Cameron Hovey (Dept. of Chemistry), MSU Mankato  
*Danae Quirk Dorr, Faculty Mentor (Dept. of Chemistry), MSU Mankato*
  
11. **Surveying College Students with Disabilities about their Perceptions of Test Accommodations**  
 Melissa Stewart (Dept. of Psychology), MSU Mankato  
 Grace Cimino (Dept. of Psychology), MSU Mankato  
*Carlos Panahon, Faculty Mentor (Dept. of Psychology), MSU Mankato*
  
12. **Time Course of the Wounding Effect on Lipoxygenase Expression in Soybean Leaves**  
 Eva Serem (Dept. of Chemistry), MSU Mankato  
*James Rife, Faculty Mentor (Dept. of Chemistry), MSU Mankato*
  
13. **The Effects of Body Image on Memory and Other Cognitive Processes**  
 Ericka Blank (Dept. of Psychology), St. Cloud State University  
*Leslie Valdes, Faculty Mentor (Dept. of Psychology), St. Cloud State University*
  
14. **Verifying the Speciation of Molybdenum in Sulfidic and Polysulfidic Natural Waters Using Ion Chromatography with Suppressed Conductivity Detection**  
 Clayton Wagner (Dept. of Chemistry), MSU Mankato  
 Megan Maloney, (Dept. of Chemistry), MSU Mankato  
 Redeat Dadi, (Dept. of Chemistry), MSU Mankato  
*Trenton Vorlicek, Faculty Mentor (Dept. of Chemistry), MSU Mankato*
  
15. **Disparagement Humor as Social Commentary: Satire, Sexism, and the All-American Family Guy**  
 Myah Nelson, (Psychology Program), Southwest MSU  
*Corey Butler, Faculty Mentors (Psychology Program), Southwest MSU*  
*Scott Peterson, Faculty Mentor (Psychology Program), Southwest MSU*

- 16. Prolonging Structural Integrity of Biodegradable Plant Fabric/Polylactic Acid Based Composites**  
 Zachary Block (Dept. of Composite Materials Engineering), Winona State University  
 Stosch Sabo (Dept. of Composite Materials Engineering), Winona State University  
*Dr. Maryam Eslamloo-Grami, Faculty Mentor (Dept. of Composite Materials Engineering), Winona State University*
- 17. The Mozart Effect: Reality or Illusion?**  
 Christopher D. Ehlers (Psychology Program), Southwest MSU  
 Lindsey M. Parlow (Psychology Program), Southwest MSU  
 Jennifer M. Johnson (Psychology Program), Southwest MSU  
*Scott Peterson, Faculty Mentor (Psychology Program), Southwest MSU*
- 18. Verifying the Identities of Potential Meteorites through Chemical Analysis**  
 Jordana Anderson (Dept. of Earth Sciences), MSU Moorhead  
 Samantha Buhr (Dept. of Earth Sciences), MSU Moorhead  
 Meridith Ramsey (Dept. of Earth Sciences), MSU Moorhead  
*Russ Colson, Faculty Mentor (Dept. of Earth Sciences), MSU Moorhead*
- 19. What is an Adult: An Analysis of Individual Versus Transition Criteria in Defining Adulthood**  
 April Schones (Dept. of Sociology), Winona State University  
*Dr. Aurea Osgood, Faculty Mentor (Dept. of Sociology), Winona State University*
- 20. Finding the Beat in Rehabilitation: The Role of Music Therapy in Neurologic Rehabilitation**  
 Mackenzie Schorn (Dept. of Sociology), MSU Moorhead  
*Susan Humphers-Ginther, Faculty Mentor (Dept. of Sociology), MSU Moorhead*
- 21. Detecting Emotional and/or Mental Instability in Individuals According to Their Degree of Social Competence**  
 Misty Schwab (Dept. of Sociology), MSU Moorhead  
*Susan Humphers-Ginther, Faculty Mentor (Dept. of Sociology), MSU Moorhead*
- 22. Constructing a Pulsed Field Gradient Nuclear Magnetic Resonance (PFG-NMR) Apparatus**  
 Wes Teo (Dept. of Physics and Astronomy), MSU Moorhead  
 Pragalv Karki (Dept. of Physics and Astronomy), MSU Moorhead  
*Ananda Shastri, Faculty Mentor (Dept. of Physics and Astronomy), MSU Moorhead*
- 23. Who Are You Going to Call?**  
 Kelsey Bauer (Dept. of Sociology), MSU Moorhead  
*Susan Humphers-Ginther, Faculty Mentor (Dept. of Sociology), MSU Moorhead*
- 24. Establishing a Student Operated Soil Testing and Characterization Laboratory at Southwest Minnesota State University**  
 Alesha Finkey, (Chemistry Program), Southwest MSU

Rachel Patnoe, (Chemistry Program), Southwest MSU  
*Frank V. Schindler, Faculty Mentor (Chemistry Program), Southwest MSU*

**25. Development of DNA Fingerprinting Protocols for Environmental Isolates of *E. coli***

Trista Hacker (Biology Program), Southwest MSU  
*Tony J. Greenfield, Faculty Mentor (Biology Program), Southwest MSU*

**26. Effects of Flooding on Canola (*Brassica napus*) and Barley (*Hordeum vulgare*) Plants of Different Ages**

Amanda Meine (Environmental Science Program), Southwest MSU  
*Emily Deaver, Faculty Mentor (Environmental Science Program), Southwest MSU*  
*Thomas Dilley, Faculty Mentor (Environmental Science Program), Southwest MSU*

**27. Study of Seasonal Variations in Water Quality and Vegetation in a Shallow Wetland at Independence Park, Marshall**

Wokil Bam (Environmental Science Program), Southwest MSU  
*Emily Deaver, Faculty Mentor (Environmental Science Program), Southwest MSU*

**28. Do Teacher's Perceptions about Students with EBD Begin During Their College Education?**

Amber Schramm, Department of Psychology, MSU-Mankato  
Grace Cimino, Department of Psychology, MSU-Mankato  
*Carlos Panahon, Department of Psychology, MSU-Mankato*

**1. Eliciting Evidence for False Memories on Explicit and Implicit Memory Tests**

Farryn Helm (Dept. of Psychology), MSU Moorhead

*Christine Malone, Faculty Mentor (Dept. of Psychology), MSU Moorhead*

How does sound and spelling information interact in the early stages of spoken word recognition to affect memory on explicit and implicit memory tests? If sound and spelling information determine the pool of candidates as the spoken stimulus unfolds, study words with shared sound and spelling (parasite) should activate their corresponding target (paragraph) to a great extent during study and seem very familiar at test. Participants taking a recognition memory test (an explicit test) should then make a high rate of false recognition errors to their target (i.e., report having heard paragraph on the study list, when, in fact, it was parasite). Further, if this automatic activation process during study is indeed taking place without the listener's conscious awareness, participants taking a word fragment completion test (an implicit test) that taps into weaker memories beyond the listener's awareness should be even more sensitive to these activation effects. Evidence for activation will appear in the word fragment test as facilitated completion of the target word fragment (P\_RA\_RA\_H) after a shared information study word (parasite or paragraph) compared to an unrelated study word (minimum).

**2. Urban Turkeys: Survey of Wild Turkey Distribution and Numbers, Human Interactions, and Public Opinion in the Red River Valley in Cass (North Dakota) and Clay (Minnesota) Counties (2003-2011)**

Chelsea Schmaltz (Dept. of Biosciences), MSU Moorhead

Kara Nygaard (Dept. of Biosciences), MSU Moorhead

*Donna Stockram, Faculty Mentor (Dept. of Biosciences), MSU Moorhead*

This study started in 2003 with the objective of using mail surveys to estimate the minimum wild turkey (*Meleagris gallopavo*) population in the Red River Valley (RRV) in the Fargo/Moorhead area. The RRV offers suitable turkey habitat in a relatively narrow corridor surrounded by a dense human population. In 2004, urban-turkey interactions were monitored as well, adding a new survey in 2005 to assess public opinion on wild turkey management options in the event abatement measures became necessary due to problematic urban turkeys. Turkey observations reported from 2003 through 2010 show a strong population thriving in the RRV with an overall increase in numbers and sightings. Turkey observations reported from 2010 through 2011 show a slight decrease in the RRV turkey population. Negative interactions included turkeys blocking traffic routes, eating from bird feeders/gardens, interacting near agricultural areas, and interacting with domestic animals. This year's (2011) return rate amounted to 37.4% (89 out of 238) of surveys sent out to area observers. The opinion and observation surveys are planned to continue throughout the upcoming years.

### **3. Intuition Overrides Logic When Detecting Deception**

Colette Baudoin (Dept. of Psychology), MSU Mankato

Chelsea Schmillen (Dept. of Psychology), MSU Mankato

*Emily Stark, Faculty Mentor (Dept. of Psychology), MSU Mankato*

When listening to a story that may be a lie or a truth, it seems we should use logic to detect the lie. However, previous studies show that relying on your intuition may be a better practice when distinguishing between a lie or a true story (Albrechtsen, Meissner, & Susa, 2009). The purpose of this current study is to find if participants are able to implicitly and/or explicitly distinguish between truths and lies. Seventy-one students volunteered to participate in this study. These participants watched sixteen short video clips that featured a person telling either a true story or a lie. The participants rated whether the story was true or not, and also rated the individual on how likeable and trustworthy he or she was as well as their willingness to work on a project with that individual. Our results showed that participants did no better than chance at overtly distinguishing between lies and truths; however, the participants were intuitively rating the truth tellers significantly more likeable and more trustworthy than the liars, and they were more willing to work with the truth-tellers (all  $p < .05$ ). Many people may try to use logic and common sense when detecting a lie, rather than relying solely on their gut feelings. However, our findings suggest that if you use your intuition, you may be better at detecting deception. These findings may be beneficial to many professions including crime investigators and social workers as well as in jury deliberations and every-day social situations.

### **4. Limited Exposure of Monarch Butterfly Populations to Bt-toxin Due to Impotent Dispersal of Corn Pollen**

Jenae Olson (Dept. of Biosciences), MSU Moorhead

Kayla Sluka (Dept. of Biosciences), MSU Moorhead

*Daniel McEwen, Faculty Mentor (Dept. of Biosciences), MSU Moorhead*

Bt corn is a genetically modified organism that expresses the bacterial Bt toxin. The toxin is poisonous to most insects, working as a pesticide for corn agriculture. Although the toxin is not intended for monarchs, it is lethal if ingested. The pollen gets transferred by wind onto milkweed plants near agricultural Bt fields. We explore the possibility of an increased mortality rate in monarch larvae near Bt corn fields. If the monarchs die as larvae they never reach reproductive maturity, in turn this decreases the overall monarch population. Milkweed only accumulated enough Bt corn pollen to kill larvae when located within 0-3.5 meters of the field.

## **5. Laptops in the Classroom: Evaluating the Potential Benefits of Technology Against Distractions**

Britten Block (Dept. of Psychology), MSU Mankato

Ryan Meyer (Dept. of Psychology), MSU Mankato

Maria Almoite (Dept. of Psychology), MSU Mankato

Kayla Scott (Dept. of Psychology), MSU Mankato

*Karla Lassonde, Faculty Mentor (Dept. of Psychology), MSU Mankato*

Students in college face a decision of bringing a notebook with them to a lecture or to use a laptop for taking notes. Many students opt to bring their laptop with them to class lectures, but there are teachers that oppose laptop use in the classroom. Laptop use in classrooms has sparked a debate in the teaching community about the advantages and disadvantages (e.g., distractions) of using laptops in the classroom. To shed light on the possible utility of laptops in the classroom, the goal of the study was to determine if there is a difference in text comprehension when participants write text content on paper or if they type it on a computer. Participants read two short passages of informative text. As they read, participants copied the passages either onto a notepad by writing, or by typing on a computer. After copying the passages, they were asked a series of comprehension questions pertaining to the passage. The participants were also given the Gates-MacGinitie (4th ed.) reading skill test and a short typing assessment. We found no reliable differences on the comprehension questions between the writing and typing conditions. This outcome does not indicate a bias for one method of copying text over the other. We are currently working on a second study that follows the same procedure except participants are asked to take notes either on paper or a computer. This method is likely to more authentically represent note-taking students do while reading a text or in lecture.

## **6. Effect of Metformin in the uptake of Glucose and Amino Acids in *L. Acidophilus***

Balabhadra Khatiwada (Dept. of Chemistry), Winona State University

*Dr. Myoung E. Lee, Faculty Mentor (Dept. of Chemistry), Winona State University*

Metformin (1,1-dimethylbiguanide) is an oral anti-hyperglycemic drug used for type-2 diabetes. Type-2 diabetes happens the cells don't recognize insulin due to cell resistance (non-insulin dependent). Metformin helps in decreasing blood sugar levels.  $^{13}\text{C}$ -1-Glucose,  $^{13}\text{C}$ -1-Leucine and  $^{13}\text{C}$ -1-Methionine were provided to the *L. Acidophilus* at pH 6. Nuclear Magnetic Resonance Spectroscopy (NMR) was used to observe the uptake and metabolism of each molecule and the effects of metformin on it. Metabolism of glucose was observed as production of lactic acid was seen whereas no uptake of leucine was observed. Presence of metformin has inhibiting effect on the uptake of glucose while no change was observed on the uptake of leucine.

The binding effect of metformin with a prokaryotic protein, adenosine monophosphate nucleosidase (AMN) which is an enzyme involved in degradation of AMP was studied using a docking software, Autodock. The binding of metformin with AMN is not very strong and has a free energy of -4.51 kcal/mol and Inhibition constant ( $K_i$ ) of 500  $\mu\text{M}$ . The interactions of metformin with AMN were seen with 414 TYR, 415 ARG, 417 ARG, 475 LEU, 477 THR and 478 PHE residues.

## **7. In One Ear and Out the Other: The Correction of Psychology Misconceptions and Our Minds Resistance to It**

Samuel Erickson (Dept. of Psychology), MSU Mankato

Samantha Bergmann (Dept. of Psychology), MSU Mankato

Sarah Lewer (Dept. of Psychology), MSU Mankato

*Karla Lassonde, Faculty Mentor (Dept. of Psychology), MSU Mankato*

We are constantly being overwhelmed with information through media. While this has heralded a new era of research and advancement, the information we learn isn't always correct. Knowledge permeates the general population, and students often apply learned general misconceptions to their field of study. In previous studies, we assessed psychology students' knowledge of 50 misconceptions. Students with more experience in the major correctly identified misconceptions as "false" compared to introductory psychology students, but still held many to be true. The goal of the current study was to evaluate the effectiveness of a method of knowledge revision for misconceptions. Misconceptions were elaborated upon in a series of 24 texts and in each text a misconception was either directly stated as incorrect or not. The time it took participants to read outcome sentences containing refutation information, or only description information and no refutation, was recorded. Participants took longer to read outcome sentences following passages that didn't contain a refutation compared to those that did. Thus, the refutation texts served to compete with prior knowledge about the misconception in memory and readers had less trouble processing the outcome sentence when it was contradictory to the misconception. Additionally, participants took a pre-test assessing their knowledge for the misconceptions before reading and a post-test after reading the passages. When the assessments were compared, the average difference in score was 10.57, suggesting a positive influence of the refutation texts on knowledge. These findings can be applied and used to inform learning in the classroom.

## **8. Estimating the Molecular Volumes of Small Molecules Using IR Spectroscopy**

Etsehiwot Gebreselassie (Dept. of Chemistry), MSU Moorhead

Samantha Stewart-James (Dept. of Chemistry), MSU Moorhead

*P. Asoka Marasinghe, Faculty Mentor (Dept. of Chemistry), MSU Moorhead*

Infrared spectroscopic absorbance peaks of moderate to strongly absorbing frequencies of the solvents appear as negative peaks at such positions when solutes are added to it. Such negative peaks are used in this investigation to estimate the molecular volumes of the dissolved solutes. The magnitude of the negative peaks of toluene as the solvent was correlated to the theoretical molecular volumes of the solutes. Using such correlation plots molecular volumes of some small molecules were estimated and compared to their theoretically calculated molecular volumes. As of now the estimated molecular volumes from the proposed method were within 10-20% of the calculated values.



## **9. Detecting Deception: Studying the Cues People Use to Distinguish Between Truth-Tellers and Liars**

Amber Schramm (Dept. of Psychology), MSU Mankato

*Emily Stark, Faculty Mentor (Dept. of Psychology), MSU Mankato*

Previous research has found that although people are generally not accurate at detecting deception, when people are forced to process videos or stories intuitively, they are better at distinguishing between lies and truths (Albrechtsen, Meissner, & Susa, 2009). The current study incorporates an open-ended measure to learn more about what types of specific cues influence participants' judgments of lies and truths. Seventy-one participants viewed 16 video clips, some truths and some lies. Participants were then asked to determine whether the video clip was a truth or a lie and to write down any deception cues they noticed that helped them make their decision. Some of the categories used to code these cues include: non-verbal, verbal story content, overall tone, delivery, and emotional delivery. Participants also responded to a scale measuring the extent to which they rely on intuition when making judgments. Results show that overall accuracy for lie detection is not significant, consistent with previous research. As we complete the coding of the cue listings, we expect that those who are more accurate in lie-detection will notice more deception-relevant cues than participants who are less accurate at lie detection, and that participants who rely more on intuition will be more accurate in detecting lies. This research combines individual difference measures of use of intuition, along with open-ended assessments of the cues that participants use, which has not yet been done in previous research, and will help us to learn more about how people distinguish between lies and truths.

## **10. Identification of Metabolic Adducts Formed Between the Common Food Contaminant, HMF, and DNA**

Cameron Hovey (Dept. of Chemistry), MSU Mankato

*Danae Quirk Dorr, Faculty Mentor (Dept. of Chemistry), MSU Mankato*

5-Sulfoxymethylfurfural (SMF) is a metabolite of the common heat-related food contaminant, 5-hydroxymethylfurfural (HMF). Investigations of HMF in vitro showed no mutagenic activity, but HMF was found to be mildly carcinogenic in female mice. HMF is thought to be converted in vivo by sulfotransferase enzymes into SMF, which is a stronger carcinogen. Until recently, SMF had not been detected as a metabolite of HMF in humans or rodents, but the conversion of HMF to SMF in mice following administration of HMF has now been confirmed and quantified. No literature yet exists that investigates the structure or prevalence of SMF adducts with DNA. In this study, we examined SMF and its reactions with DNA in order to elucidate the structure of any such adducts. After synthesizing SMF, reaction standards were made by allowing SMF to react with nucleosides of DNA under physiological conditions (pH 7.2, 37° C). SMF was then combined with Calf Thymus DNA (CT DNA) under the same conditions. Nuclear Magnetic Resonance (NMR) spectroscopy and High-Performance Liquid Chromatography with UV detection (HPLV-UV) were used to investigate the products of these reactions.

## **11. Surveying College Students with Disabilities about their Perceptions of Test Accommodations**

Melissa Stewart (Dept. of Psychology), MSU Mankato

Grace Cimino (Dept. of Psychology), MSU Mankato

*Carlos Panahon, Faculty Mentor (Dept. of Psychology), MSU Mankato*

Test accommodations are commonly defined as a change in testing materials or procedures that enables students with disabilities to participate in assessments in ways that reflect their skills and abilities. The purpose of test accommodations is to change the way the test is administered to correct the disadvantage for a higher score caused by a disability. Accommodations are commonly utilized by college students who have a documented disability. However, little research has focused on the perceptions of college students regarding test accommodations. Sanz (2011) reported college students perceived test accommodations to be somewhat unfair. Unfortunately, very few students with disabilities participated in the previous study. Therefore, the purpose of this study was to learn more about college students with disabilities and their perceptions of test accommodations. Students eligible to receive test accommodations through the Office of Disability Services at MSU Mankato were recruited. Participants completed an online survey asking questions about their perceptions of test accommodations for various types of assessments. Results of this study will be compared with the results from Sanz (2011). Similarities and differences between the two studies will be discussed. Findings will provide a better understanding of the perceptions of students with disabilities regarding test accommodations. Modifications can be made to preexisting accommodations to provide an increased benefit for students with disabilities.

## **12. Time Course of the Wounding Effect on Lipoxygenase Expression in Soybean Leaves**

Eva Serem (Dept. of Chemistry), MSU Mankato

*James Rife, Faculty Mentor (Dept. of Chemistry), MSU Mankato*

Lipoxygenases (LOXs) are enzymes that catalyze the addition of molecular oxygen to unsaturated fatty acids to form hydroperoxide products. Soybean plants have several LOX isoenzymes or different proteins that catalyze the same reaction. Soybean seeds contain at least three LOX isoenzymes while at least six different isoenzymes are in the vegetative tissue. Expression of some LOX isoenzymes increases after mechanical wounding in soybean plants. The objective of this project was to explore the time course of the effect of wounding on the expression of Lox mRNAs. Plants were wounded at the bifoliate stage; one leaf was wounded while the other was used as a systemic leaf. Both leaves were harvested separately at 3½, 6 and 24 hours after wounding. Leaves were also harvested from control plants, which were not wounded. RNA was isolated from the samples using the RNeasy Plant Minikit from Qiagen. RNA quantities and quality were assessed by measuring sample absorbencies at 260 and 280nm. cDNAs were prepared using a High-Capacity cDNA Reverse Transcription Kit from Applied Bio systems. The Quantitative Polymerase Chain Reaction experiment was done on a Step One plus Real-Time PCR system from Applied Bio systems using SYBR Green as the fluorescent indicator. Wounded leaves showed a significant increase in the expression of Lox 7 mRNA 3½ hours after wounding. This level was maintained 6 hours after wounding, but significantly increased again 24 hours after wounding. Systemic leaves did not show a significant increase in Lox 7 expression until 24 hours after wounding.

## **13. The Effects of Body Image on Memory and Other Cognitive Processes**

Ericka Blank (Dept. of Psychology), St. Cloud State University

*Leslie Valdes, Faculty Mentor (Dept. of Psychology), St. Cloud State University*

In our society, unhealthy body image is a significant issue affecting an increasing number of individuals both psychologically and physically. Since the advent of the television, there has been a marked increase in our society on focusing on visual stimuli. My study centers on whether the subjects' memories of pictures of full body shots are affected by their own body image. Body image is the impression an individual has of their own body and is on a continuum from extremely positive to extremely negative. The procedure for my study is as follows. Participants will study pictures of different individuals. Following this, they will take a test which assesses their personal body image. They will then take a recognition memory test. In this test, 25% of the pictures will be initial images from the study phase, 12.5% will be thinner versions of initial images, 12.5% will be heavier versions of initial images, and 50% will be completely new images. The subjects will be shown these pictures and asked to identify whether or not each picture was one of the initial images. My hypothesis is that an extreme body image that is on either end of the spectrum, very positive or very negative, will adversely affect the subjects' ability to accurately recognize the initial images. I further hypothesis that a negative body image will have a larger effect on the subjects' ability to recognize the initial images than any other body image will. The impact body image has on self-esteem will be discussed. Further implications of my study include the effects of body image on memory and other basic cognitive processes. These will also be discussed.

#### **14. Verifying the Speciation of Molybdenum in Sulfidic and Polysulfidic Natural Waters Using Ion Chromatography with Suppressed Conductivity Detection**

Clayton Wagner (Dept. of Chemistry), MSU Mankato

Megan Maloney, (Dept. of Chemistry), MSU Mankato

Redeat Dadi, (Dept. of Chemistry), MSU Mankato

*Trenton Vorlicek, Faculty Mentor (Dept. of Chemistry), MSU Mankato*

Within sulfidic waters, Mo speciation is characterized by the formation of thiomolybdates ( $\text{MoO}_n\text{S}_{4-n}^{2-n}$ ,  $n=1-4$ ). Using thermodynamic constants, Mo speciation in sulfidic basins has been calculated. However, actual speciation in natural waters has not been verified because a suitable analytical method remains elusive. Zero-valent sulfur has been shown to influence Mo speciation and sequestration by pyrite via formation of anionic Mo-polysulfido complex (es). Unfortunately, optical means were not able to identify the complex (es) definitively. We have demonstrated that ion chromatography with suppressed conductivity detection gives linear response down to at least  $10^{-8}$  M  $\text{MoO}_4^{2-}$ . IC methods are developed to quantify contrived mixtures of  $\text{MoO}_4^{2-}$  and thiomolybdates at  $\Sigma\text{Mo}=10^{-7}$  in simulated seawater. IC-MS is used to identify and quantify Mo-polysulfido complex (es) formed in polysulfidic test solutions; kinetic and equilibrium constants will be calculated. This research will better define Mo speciation and its relation to Mo fixation in anoxic waters.

#### **15. Disparagement Humor as Social Commentary: Satire, Sexism, and the All-American Family Guy**

Myah Nelson, (Psychology Program), Southwest MSU

*Corey Butler, Faculty Mentors (Psychology Program), Southwest MSU*

*Scott Peterson, Faculty Mentors (Psychology Program), Southwest MSU*

It has long been suggested that television shows that mock socially unacceptable behavior are actually promoting it. This was first suggested with the show *All in the Family* and currently with the Fox hit, *Family Guy*. It would appear through the following research that this may in fact be somewhat accurate. This study is an investigation of the relationship between television viewing and disparagement humor. We examined college students' viewing time of the television show *Family Guy*, along with their responses toward disparaging humor against women (i.e. sexist humor), and gender. Data were collected from 126 participants, of which, thirty-two males were regular viewers of *Family Guy*. When males were examined in relation to television viewing habits, there was a statistically significant correlation between the viewing and disparagement humor responses. A separate analysis found that the effect was replicated for an additional television program (*Two and a Half Men*). Furthermore, males indicated a higher preference for disparaging humor than females. This study suggests that men have an affinity for disparagement television programming, thus giving insight into how popular culture can influence sexist attitudes in some young males.

## **16. Prolonging Structural Integrity of Biodegradable Plant Fabric/ Polylactic Acid Based Composites**

Zachary Block (Dept. of Composite Materials Engineering), Winona State University

Stosch Sabo (Dept. of Composite Materials Engineering), Winona State University

*Dr. Maryam Eslamloo-Grami, Faculty Mentor, Dept. of Composite Materials Engineering), Winona State University*

There is a continued interest in biodegradable composites and plastics, along with the desire for green materials. Polylactic acid, which is a biodegradable polymer produced from corn starch, is one material that can fill this need, however the polymer degrades fast enough that most structural integrity is lost in a short period of time. Panels composed of biodegradable Poly-Lactic Acid (PLA) with a coarse woven jute fabric (Burlap) and without any reinforcement were made by using a hot press, the conditions used to create the polymer panels were specific to the size of the mold and the amount of material used. In order to control the degradation of the samples, some of the tensile and flex sample bars were coated with oil based polyurethane and then exposed to a controlled environment through the use of an advanced weathering chamber that uses alternating cycles of UV light, 100 % humidity at 55° C temperatures. On regular intervals during the weathering process mechanical testing was carried out through flex and tensile tests. The tests were performed before and after a specified amount of time was spent in the chamber in order to gauge the amount of degradation that took place over time. Thermal analysis was also carried out on some samples using a Thermo-Gravimetric Analyzer and a Differential Scanning Calorimeter, and Dynamic Mechanical Analyzer before and after exposure. Mechanical testing showed a decrease in the tensile strength as time of exposure increased however, the panels that were coated with the polyurethane had slower degradation compared to the uncoated samples.

## **17. The Mozart Effect: Reality or Illusion?**

Christopher D. Ehlers (Psychology Program), Southwest MSU

Lindsey M. Parlow (Psychology Program), Southwest MSU

Jennifer M. Johnson (Psychology Program), Southwest MSU

*Scott Peterson, Faculty Mentor (Psychology Program), Southwest MSU*

Our experiment examines the “Mozart Effect,” which claims listening to classical music can increase intelligence and test performance. Our experiment involved 56 participants, primarily from psychology classes at Southwest MSU. Participants listened to music or silence for 3 minutes based on random assignment to their condition—Mozart, Screamo, or Silence. After 3 minutes, participants continued to listen to music/silence and performed a mental rotation test. Previous research largely discredits the original Mozart Effect study, which found a significant increase in IQ scores after listening to Mozart. Based on this, we predict our results to find little to no effect on test performance from listening to classical music. This research has implications in parenting and teaching since Mozart is found in houses and classrooms across the country to turn children into “geniuses.” However, if the Mozart effect is an illusion, copious time and resources are being misplaced.

**18. Verifying the Identities of Potential Meteorites through Chemical Analysis**

Jordana Anderson (Dept. of Earth Sciences), MSU Moorhead

Samantha Buhr (Dept. of Earth Sciences), MSU Moorhead

Meridith Ramsey (Dept. of Earth Sciences), MSU Moorhead

*Russ Colson, Faculty Mentor (Dept. of Earth Sciences), MSU Moorhead*

Have you ever wondered how a meteorite is distinguished from a tektite or some less exotic rock native to Earth? Identifying the chemical components and physical characteristics of meteorites is essential to verifying their identity. We received three samples, from Dennis Jacobs, Jessie Rock and Gene King, that were all called meteorites. Our project will attempt to determine if the samples are meteorites or something else. Petrographic thin sections were made, which will be studied using a petrographic microscope before being carbon coated and analyzed using an electron microprobe. The electron microprobe analysis will enable us to determine the chemical composition of each sample. If a sample is indeed a meteorite, we will expect it to contain graphite and metallic iron. Both are rare on Earth, but common in rocks that originated outside our atmosphere. Currently, the only sample we believe may be a meteorite is the one given to us by Jessie Rock. If it is, it has been severely altered and weathered during its time on Earth. The other two are more likely tektites. Tektites are pieces of the Earth which exited the atmosphere during an asteroid impact, then re-entered the atmosphere severely altered.

**19. What is an Adult: An Analysis of Individual Versus Transition Criteria in Defining Adulthood**

April Schones (Dept. of Sociology), Winona State University

*Dr. Aurea Osgood, Faculty Mentor (Dept. of Sociology), Winona State University*

Over the past decade, the increase in focusing on the entrance into adulthood has shown a changing definition of adulthood and a delay in its beginning for adolescence. Research suggests that individuals go through adulthood transitions, such as marriage and childbearing, before being considered an adult. Recent research on emerging adulthood suggests that the transition between adolescence and adulthood is more individualized. In this study, 464 undergraduate students at a mid-sized Midwestern University were surveyed on the criteria necessary for becoming an adult. Results from the current research suggest that most students do not yet feel like an adult.

**20. Finding the Beat in Rehabilitation: The Role of Music Therapy in Neurologic Rehabilitation**

Mackenzie Schorn (Dept. of Sociology), MSU Moorhead

*Susan Humphers-Ginther, Faculty Mentor (Dept. of Sociology), MSU Moorhead*

Many people are afflicted with neurologic conditions such as dementia, Parkinson's disease, stroke and acquired brain injuries, and there are countless areas of rehabilitation for them to benefit from. Many strategies include pharmaceutical treatment, along with speech and physical therapies. However, there are other forms of therapy that can aid in a patient's rehabilitation. Music therapy is one form of alternative therapy that has gained some ground and recognition in the past years, and I believe there has to be further research into the viability and use of such therapy. Research that has been done suggests that music therapy is beneficial in improving speech prosody and phonation in those suffering from neuro-communication disorders, and there was an improvement in the mental flexibility aspect of executive

functioning among those suffering from brain injuries. Also, those who experienced physical limitations due to a stroke, showed improvement in their fine and gross motor skills after music-supported therapy. Data from the Integrated Health Interview Series will be used to analyze the relationship between those who consider themselves as having a functional limitation due to a stroke, and their perceived health status. I will be looking further into the various forms of music therapy, its effects on the previously mentioned neurologic issues, and how it may impact future rehabilitation procedures.

### **21. Detecting Emotional and/or Mental Instability in Individuals According to Their Degree of Social Competence**

Misty Schwab (Dept. of Sociology), MSU Moorhead

*Susan Humphers-Ginther, Faculty Mentor (Dept. of Sociology), MSU Moorhead*

As someone who silently fought depression off and on for several years, I often wondered why no one took my social distance as a cry for help. It only recently occurred to me that few people link social insecurity with a deeper internal battle. The purpose of my research is to discover a connection between emotional and mental stability with one's ability to confidently socialize, and to determine which variable serves as the instigator. Data from the General Social Survey will be used to examine the relationship between people who consider themselves sociable and those who have a mental or emotional disorder. I hypothesize that individuals who view themselves as being unsociable are more likely to exhibit symptoms of mental and/or emotional disabilities than people who demonstrate more advanced social skills. I intend to help people realize the importance of detecting instability early on by examining one's social patterns. This research will benefit the family members and friends of individuals who experience internal discomfort that often goes unnoticed.

### **22. Constructing a Pulsed Field Gradient Nuclear Magnetic Resonance (PFG-NMR) Apparatus**

Wes Teo (Dept. of Physics and Astronomy), MSU Moorhead

Pragalv Karki (Dept. of Physics and Astronomy), MSU Moorhead

*Ananda Shastri, Faculty Mentor (Dept. of Physics and Astronomy), MSU Moorhead*

The measurement of hydrogen diffusion constants through proton conductors is important in the study of fuel cells. The diffusion constant is the proportionality factor between the diffusion flux and concentration gradient. A PFG-NMR apparatus creates a magnetic field gradient which causes the hydrogen nuclei to precess at different frequencies. The change in the spin echo amplitude is then used to determine the hydrogen diffusion constant through the material of interest. A PFG-NMR apparatus will be constructed and the calibration of the measurements discussed.

### **23. Who Are You Going to Call?**

Kelsey Bauer (Dept. of Sociology), MSU Moorhead

*Susan Humphers-Ginther, Faculty Mentor (Dept. of Sociology), MSU Moorhead*

How sexual assaults are handled on campus can cause some health issues that could be solved by meeting a few accommodations. The reason this topic interests me is because campus doesn't handle it efficiently or effectively. I've interviewed multiple authoritative figures on campus about the issue, and came to the conclusion that the system that is currently set up can cause health issues, along with many mental health

issues. The things that make it a health issue are easy to identify: Hendrix isn't open 24/7, so students that may be hurt will have to go at least 8 blocks to get to the nearest hospital, which can give time for the condition to get worse. There's also a mental health issue with knowing that Public Safety admits that they don't have the training to handle such situations and they're liable for calling the cops, so the victim will have to repeat their story multiple times. I'm looking into this more deeply than before to figure out why. Why isn't Hendrix open 24/7? Is it staffing or funding? And why doesn't Public Safety have adequate training? Is it funding or just lack of resources to achieve better training?

#### **24. Establishing a Student Operated Soil Testing and Characterization Laboratory at Southwest Minnesota State University**

Alesha Finkey, (Chemistry Program), Southwest MSU

Rachel Patnoe, (Chemistry Program), Southwest MSU

*Frank V. Schindler, Faculty Mentor (Chemistry Program), Southwest MSU*

Soil Testing and Characterization Laboratories are an essential part of prudent soil and water nutrient and environmental management programs. Establishing a soil-testing laboratory in southwest Minnesota would be supportive to the area, and provide a valuable service-learning educational opportunity for students majoring in Agronomy, Chemistry, Biology, and Environmental Science. A student operated testing laboratory is novel. A laboratory that is student trained and operated will effect behavioral change as students develop a sense of ownership and contributory citizenship. The objectives of this presentation are: 1) discuss the process of establishing a Soil Testing and Characterization Laboratory at Southwest MSU (SMSU) that is certified by the Minnesota Dept. of Agriculture, 2) present a summary of results from cycle one of the Agricultural Laboratory Proficiency (ALP) Program, and 3) provide our vision for the certified laboratory. In researching the possibility of establishing a soil-testing laboratory at SMSU, a SMSU chemistry major concluded that such an undertaking elicits significant support from local farmers, crop consultants, and the Minnesota Dept. of Agriculture. Cycle one of the ALP evaluation report indicates compliance with certification requirements. Five of six soil properties were in agreement with other national and international laboratories. A SMSU Soil Testing and Characterization Laboratory serves as a springboard to student designed, field-plot yield response trials in cooperation with SMSU Agronomy Program and the Southwest Research and Outreach Center in Lamberton, MN. Ultimately, an Environmental Research and Outreach Center could be realized.

#### **25. Development of DNA Fingerprinting Protocols for Environmental Isolates of *E. coli***

Trista Hacker (Biology Program), Southwest MSU

*Tony J. Greenfield, Faculty Mentor (Biology Program), Southwest MSU*

There are a variety of strains of the Gram-negative bacterium *Escherichia coli*. Some of these strains comprise an important element of the normal intestinal microflora of animals. Other strains are pathogenic and commonly associated with food and waterborne illness. In environmental monitoring, coliform bacteria provide a presumptive indicator of fecal contamination of surface waters or food. Detection and characterization of *E. coli* strains poses important scientific and practical applications. There are many molecular and biochemical methods available to track sources of fecal bacteria in water, however each method comes with limitations. Variable number tandem repeats (VNTR) have been known to exist in eukaryotes for a long time, and due to their polymorphic nature, have been useful for



identification purposes. Over the past decade, variable number tandem repeats have been identified in prokaryotes and have been proposed as a means for molecular typing of pathogens. A pilot study was conducted using eight different *E. coli* strains to determine if Multiple-Locus Variable Number Tandem Repeat Analysis (MLVA) might be used for source tracking of *E. coli* in the environment. Six VNTR regions within the *E. coli* genome were chosen for amplification by PCR and examined using capillary gel electrophoresis. Using only these six VNTRs, it was possible to obtain a unique MLVA profile for each *E. coli* strain. The genetic stability of these profiles will be examined, and trials will begin on previously obtained environmental samples.

## **26. Effects of Flooding on Canola (*Brassica napus*) and Barley (*Hordeum vulgare*) Plants of Different Ages**

Amanda Meine (Environmental Science Program), Southwest MSU

*Emily Deaver, Faculty Mentor (Environmental Science Program), Southwest MSU*

*Thomas Dilley, Faculty Mentor (Environmental Science Program), Southwest MSU*

Flooding of agricultural land can be devastating to the growth of plants and to those relying on food and income from those crops. Two species, barley and canola, at two different starting ages (3 weeks and 5 weeks) were grown in flooded conditions to evaluate growth and survival compared to non-flooded controls. Shoot height was measured weekly for 4 weeks with root and shoot dry weights measured at the end of the study. Shoot heights for all submerged groups were significantly shorter compared to the control. Canola total leaf length at both ages also showed significantly less length than their controls. Dry weights of shoots and roots for all submerged groups were significantly less compared to the control, except for barley 5-week old roots. Flooding conditions showed a hindering of plants height and biomass for both species of both ages. Barley at 5 weeks old showed growth of reproductive parts, even after being submerged. Plant age does make a difference to a plant's ability to continue to grow. Understanding how plants of different ages react to flooding will help us to understand the long term damage due to flooding of agricultural fields.

## **27. Study of Seasonal Variations in Water Quality and Vegetation in a Shallow Wetland at Independence Park, Marshall**

Wokil Bam (Environmental Science Program), Southwest MSU

*Emily Deaver, Faculty Mentor (Environmental Science Program), Southwest MSU*

Wetlands are lands transitional between terrestrial and aquatic system where the water table is usually at or near the surface or the land is covered by shallow water. The physical and chemical characteristics in wetlands are altered with changes in environmental factors and human activities. The purpose of this project was to observe the seasonal variations in water quality and vegetation in a shallow wetland at Independence Park, Marshall, Minnesota. Water quality parameters (dissolved oxygen, alkalinity, pH, nitrate, phosphate, turbidity and temperature) were measured weekly throughout September and October using LaMotte water test kits. It was observed that there were some variations in water quality with a change in seasons, although not a lot. Cattail, beaked willow, marsh aster and goldenrod were found to be the most dominant vegetation. Precipitation and human activities had the greatest impact on the water quality.

## **28. Do Teacher's Perceptions about Students with EBD Begin During Their College Education?**

Amber Schramm, Department of Psychology, MSU-Mankato

Grace Cimino, Department of Psychology, MSU-Mankato

*Carlos Panahon, Department of Psychology, MSU-Mankato*

Previous research has found three indicating factors that demonstrate the presence of an emotional behavior disorder (EBD) according to Huesy (1992): a lack of self-control, emotional hypersensitivity, and impulsivity. Educators play an important role in the development of children with EBD.

Unfortunately, of teachers surveyed who worked with students with EBD, although they were qualified and perceived themselves as prepared to work with students with EBD, over 50% were planning to leave their positions within the next five years (Adera & Bullock, 2010). For this reason, it is important to examine the perceptions of teachers regarding children with EBDs in order to promote teacher satisfaction and lower stress and burnout. The current study surveys pre-service teachers, which includes undergraduate students enrolled in the College of Education. This population is ideal to survey considering their future career aspirations in a setting in which they will likely be in contact with EBD. This study poses to survey 400 undergraduate education majors. Participants will receive a survey with approximately 25 questions about the participant's current perceptions of EBD. The construct of the survey is meant to gain information about the perceptions that pre-service teachers have of students with EBD. Data collection is ongoing, but is expected to be complete by March 2012. It is hypothesized that pre-service teachers will not share the perceptions previous research has shown that educators in the schools maintain, which suggests that the perceptions develop after the teacher is working in the field. Means, standard deviations, and frequency distributions of this data will be calculated and compared to previous research. These results will contribute to the research already done pertaining to educators perceptions of EBD. This study may reveal what perceptions there are in the pre-service teacher population, and where and when the perceptions arise. The results can be used to determine how to best contribute to teacher's accurate understanding of EBD and encourage a better work environment for teachers who work with students with EBD.

## Automotive Engineering Technology, Manufacturing Engineering Technology, Physics, Physics & Astronomy

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### 1. Formula Sae Data Acquisition Interface

Christopher Langlois (Dept. of Automotive Engineering Technology), MSU Mankato

Devin Moyer (Dept. of Automotive Engineering Technology), MSU Mankato

*Gary Mead, Faculty Mentor (Dept. of Automotive Engineering Technology), MSU Mankato*

### 2. Formula SAE Fuel Injection Placement

David Mengelkoch (Dept. of Automotive Engineering Technology), MSU Mankato

Bryce Tillman (Dept. of Automotive Engineering Technology), MSU Mankato

*Dr. Bruce Jones, Faculty Mentor (Dept. of Automotive Engineering Technology), MSU Mankato*

### 3. A Study on Lean Manufacturing Principles: Usage of Lean Manufacturing Tools for the Process & Quality Improvement

Pawan Bhandari (Dept. of Manufacturing Engineering Technology), MSU Mankato

*Guanghsu Chang, Faculty Mentor (Dept. of Manufacturing Engineering Technology), MSU Mankato*

### 4. Collection and Analysis of a $^{13}\text{N}$ Labeled Ammonia Radiotracer

Nicholas Compton (Dept. of Mathematics and Physics), MSU Mankato

John Clymer (Dept. of Electrical Engineering), MSU Mankato

James Cotter (Dept. of Electrical Engineering), MSU Mankato

Henry Dam (Dept. of Physics), MSU Mankato

Zach Lesko (Dept. of Mathematics and Physics), MSU Mankato

Lucas Swanson (Dept. of Physics), MSU Mankato

*Dr. Andrew Roberts, Faculty Mentor (Dept. of Physics and Astronomy), MSU Mankato*

### 5. Mathematical Model of Throwing a Baseball

Shouvik Bhattacharya (Dept. of Physics and Astronomy), MSU Moorhead

*Damiano Fulghesu, Faculty Mentor (Dept. of Mathematics), MSU Moorhead*

### 6. Accessing Spatial & Dosimetric Accuracy with Lucy® 3D QA Phantom

Victoria Honetschlager (Dept. of Physics and Astronomy), MSU Moorhead

*Stephen Lindaas, Faculty Mentor (Dept. of Physics and Astronomy), MSU Moorhead*

**1. Formula Sae Data Acquisition Interface**

Christopher Langlois (Dept. of Automotive Engineering Technology), MSU Mankato

Devin Moyer (Dept. of Automotive Engineering Technology), MSU Mankato

*Gary Mead, Faculty Mentor (Dept. of Automotive Engineering Technology), MSU Mankato*

Necessary for vehicle development, data acquisition systems are utilized for viewing dynamic effects on the entire vehicle. These systems will monitor acceleration, cornering, braking, surface, and driver effects. Virtually every manufactured vehicle utilizes many different sensors to maintain engine operation commonly known as engine management. The Formula SAE vehicle maintains separate engine management and data acquisition systems, utilizing separate software for logging data. Interfacing the engine management and data acquisition system is of immense value, harnessing the ability to gather data from every portion of the vehicle with one system. The Interface functions on simple principles, the data management system outputs data through a transmit line, sending all engine specific sensor output values. The data acquisition system interprets the information through a receive line. The interface option purchased did not function as described. It was programmed for higher functioning engine management systems, different from the current system. The data acquisition system received data at a different rate than what the engine management sends. The electrical engineering students built an AVR microprocessor to convert the data rates that the engine management system was sending so the data acquisition unit could read and interpret the data. The team successfully accomplished the communication link between the two systems and worked on mapping out the correct channel identification codes and values. The team can now utilize all information through a single-wire, using one system allowing for superior testing, and diagnostic capabilities.

**2. Formula SAE Fuel Injection Placement**

David Mengelkoch (Dept. of Automotive Engineering Technology), MSU Mankato

Bryce Tillman (Dept. of Automotive Engineering Technology), MSU Mankato

*Dr. Bruce Jones, Faculty Mentor (Dept. of Automotive Engineering Technology), MSU Mankato*

Fuel injector placement contributes to engine performance, emission-output, and fuel efficiency. There are two methods of fuel injection. Direct fuel injection sprays fuel directly into the cylinder, and port injection sprays fuel into the air stream before it enters the cylinder. Although many manufacturers are starting to introduce direct fuel injection, port injection is still a viable means of fuel distribution within internal combustion engines. Just recently port injection has been implemented into small engine construction. Before port injection most small engines were carbureted. Port injection is better than carburetion because fuel can be more accurately controlled as well as delivered much closer to the cylinder than a carburetor. Extensive research is necessary to gain a full understanding of fuel delivery capabilities for these types of applications. The overall goal of this project was to determine whether a single fuel injector should be located such that the spray pattern opposes or coincides with intake airflow in order to obtain better engine performance. Both methods were designed and constructed to be tested on a turbocharged single cylinder KTM 525 engine using a blend of 85% ethanol and 15% pump gasoline. Computer models were constructed prior to prototype development. Engine performance was tested and evaluated using the SuperFlow engine dynamometer. Using the parameters of horsepower output, intake

temperature reduction, and stable air/fuel ratio to evaluate performance, it is predicted that the co-flow injector placement will be superior.

### **3. A Study on Lean Manufacturing Principles: Usage of Lean Manufacturing Tools for the Process & Quality Improvement**

Pawan Bhandari (Dept. of Manufacturing Engineering Technology), MSU Mankato

*Guanghsu Chang, Faculty Mentor (Dept. of Manufacturing Engineering Technology), MSU Mankato*

America's manufacturers are at the soul of country's economy, providing good-paying jobs for millions of Americans. The U.S. manufacturing sector is today the world's largest and is number one in GDP as indicated by International Monetary Fund (IMF) 2011. Despite few challenges, many sectors of American manufacturing have the potential to enjoy significant growth and success. Over the last 30 years, the United States has had the largest increase in manufacturing output among major developed countries. Our enterprise, An American manufacturer, carries a long history of industrial manufacturing service to the local as well as international market. In order to maximize the production, profit and quality with minimized loss in the process, certain manufacturing and process improvement techniques were carried out at the site. Today these tools are practiced and studied not only in manufacturing enterprises but also in various sectors such as hospitals, recreational centers, government and private sectors and so on. Utilizing lean manufacturing principles, we studied the existing process status, analyzed all the data drafted and suggested appropriate solutions and methodologies to the leadership to overcome the discrepancies found and to increase the efficiency and quality of the manufacturing process and products. Companies today are spending millions of dollars in research and development projects to enhance manufacturing processes and their products so that they can lead the competing market with one step ahead of all. The research was greatly helpful to plan and achieve the enterprise's future incentives and revenue as well as other core goals.

### **4. Collection and Analysis of a $^{13}\text{N}$ Labeled Ammonia Radiotracer**

Nicholas Compton (Dept. of Mathematics and Physics), MSU Mankato

John Clymer (Dept. of Electrical Engineering), MSU Mankato

James Cotter (Dept. of Electrical Engineering), MSU Mankato

Henry Dam (Dept. of Physics), MSU Mankato

Zach Lesko (Dept. of Mathematics and Physics), MSU Mankato

Lucas Swanson (Dept. of Physics), MSU Mankato

*Dr. Andrew Roberts, Faculty Mentor (Dept. of Physics and Astronomy), MSU Mankato*

The production of  $^{13}\text{N}$  ( $t_{1/2} \sim 9.96$  minutes) was accomplished at the applied nuclear science lab at MSU Mankato. Using a 400keV Van de Graaff positive ion accelerator, one can create the nitrogen isotope through the  $^{12}\text{C}(d,n)^{13}\text{N}$  reaction. Radiolabeled  $^{13}\text{N}$  compounds are commonly used for physiological imaging using PET. The method used to drive such a reaction involves irradiating the custom carbon target with a deuteron beam. The carbon target is then heated by an electric current to release the nitrogen isotope while passing a suitable reaction gas through the target apparatus to extract the  $^{13}\text{N}$  from the carbon matrix. The released gas will be in a form that can be used for Positron Emission Tomography (PET), a quantitative nuclear imaging technique. One tracer of particular interest is the compound

$^{13}\text{N}$ . Although the amount produced is insufficient for imaging work, the theory and procedure may be applied at higher energy laboratories, capable of a greater yield reaction such as  $^{13}\text{C}(p,n)^{13}\text{N}$ .

### **5. Mathematical Model of Throwing a Baseball**

Shouvik Bhattacharya (Dept. of Physics and Astronomy), MSU Moorhead

*Damiano Fulghesu, Faculty Mentor (Dept. of Mathematics), MSU Moorhead*

In this talk a mathematical model of throwing a baseball will be presented. There are three different cases that will be addressed in this presentation. They are: First, finding the range of values for the optimum release angle at which the ball will result in a strike. Second, assuming the pitcher throws a strike, then how a batter hits a home run. Third, if the batter hits the ball to left field, but it does not result in a home run, then how the left fielder catches the ball. A simulation model will be used to explain these three cases.

### **6. Accessing Spatial & Dosimetric Accuracy with Lucy® 3D QA Phantom**

Victoria Honetschlager (Dept. of Physics and Astronomy), MSU Moorhead

*Stephen Lindaas, Faculty Mentor (Dept. of Physics and Astronomy), MSU Moorhead*

I plan to assess the spatial and dosimetric accuracy of the newly installed Novalis Tx™ radiosurgery platform at the Roger Maris Cancer Center in Fargo, ND. This will be achieved by seeing phantom through from diagnosis to treatment. I will be using Standard Imaging's Lucy® 3D QA phantom, a cranial phantom. The phantom will be imaged using Computed Tomography (CT); then the images will be transferred to a planning system where several treatment methods will be planned in the same manner as a real patient. Treatments are then exported to a computer interfaced with the radiosurgery platform; the phantom is positioned on the couch in the exact location as the imaging was taken, and then treated with radiation therapy. Data will be gathered from sensors inside the phantom as well as from the machine, and then compared in order to ensure the machine's precision. Quality assurance checks such as this maintain confidence in the machines and allow for treatments on human patients to continue as regularly planned.

**Anthropology, Social Work, Sociology**

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- 1. Survey of Symbolism in Rural Cemeteries (South of US Highway #10 in Clay County, MN with an Outlier in Wilkin County, MN)**  
Larissa Harris (Dept. of Anthropology), MSU Moorhead  
*Michael Michlovic, Faculty Mentor (Dept. of Anthropology), MSU Moorhead*
  
- 2. Effects of an Increase in Nutritional Knowledge and Diet on Individuals with Developmental Disabilities**  
Dylan Sobota (Dept. of Social Work), MSU Mankato  
*Laura Strunk, Faculty Mentor (Dept. of Social Work), MSU Mankato*
  
- 3. Peer Email Mentor Program**  
Linda Gross (Dept. of Social Work), St. Cloud State University  
*Paula Zehringer, Faculty Mentor (Dept. of Social Work), St. Cloud State University*
  
- 4. What Factors Put Adolescents at Greater Risk to Use Alcohol, Tobacco, and Other Drugs?**  
Karissa Walker (Dept. of Sociology), MSU Moorhead  
*Deborah White, Faculty Mentor (Dept. of Sociology), MSU Moorhead*

**1. Survey of Symbolism in Rural Cemeteries (South of US Highway #10 in Clay County, MN with an Outlier in Wilkin County, MN)**

Larissa Harris (Dept. of Anthropology), MSU Moorhead

*Michael Michlovic, Faculty Mentor (Dept. of Anthropology), MSU Moorhead*

This project was carried out beginning the summer of 2011 through a grant from the CSNS in an attempt to determine local trends in cemetery symbolism, which had not been researched in the area before. The study area consists of 14 townships with 17 cemeteries meeting the criteria for the survey. Digital photography was used to capture images of the gravestones (a total of 1,410). Gravestone shape also factored into the final analysis, with the most popular combination of gravestone shape and symbol being block and floral. Rural cemeteries, however, provide a distinct look at the local people and their heritage because they contain people from varying backgrounds, economic standings, social statuses, and occupations; therefore, the remainder of the findings (children excluded) did not reflect significant patterns. Children's stones were separated in the conclusions because they followed a more significantly apparent pattern overall.

**2. Effects of an Increase in Nutritional Knowledge and Diet on Individuals with Developmental Disabilities**

Dylan Sobota (Dept. of Social Work), MSU Mankato

*Laura Strunk, Faculty Mentor (Dept. of Social Work), MSU Mankato*

Little is known about the effect of a healthy diet and an increase of nutritional knowledge as it pertains to individuals with developmental disabilities. Often times, the developmentally disabled population displays decreased levels of self-esteem, increased levels of depressive disorders, and overall rates of obesity. Data will be gathered from a target population of at least two individuals with developmental disabilities that are participants in an educational curriculum called "You Are What You Eat", operated out of SMILES Center for Independent Living in Mankato, MN. Data gathered during this study will consist of qualitative and quantitative methodologies through the use of observation, questionnaires, a pre-test/post-test, interviews, and participant self-reporting. Baseline data will be collected consisting of each participant's disability, their basic health regarding nutrition, their starting body weights, and their beginning results of a Patient Health Questionnaire (PHQ-9) that measures any possible existing depressive disorders. These same methodologies will be administered at the culmination of the study as well. Research data backing up the fact that a healthier diet and nutritional knowledge for developmentally disabled individuals can greatly improve their overall lifestyles can be provided to places like group homes, DT&H (Day Training & Habilitation) facilities and social service agencies to instill awareness to those places, as well as to the general public that this issue is often unnoticed, unaddressed, and is becoming increasingly problematic for the health of this demographic.



### **3. Peer Email Mentor Program**

Linda Gross (Dept. of Social Work), St. Cloud State University

*Paula Zehringer, Faculty Mentor (Dept. of Social Work), St. Cloud State University*

In offering higher education, academic success is of chief importance. In spring 2011, within the Dept. of Social Work at St. Cloud State University, the Peer Mentor Program was launched and co-piloted between an undergraduate student and an assistant professor. The launch of this program was initiated with the desire to increase student opportunities for success and provide another medium of resource for culturally diverse students. Using SW345: Marginalized Populations as the trial course, the Peer Mentor Program offers to address possible challenges and barriers to successful learning and academic achievement. The services offered include helping students to better understand assignments and what is required, how to navigate and procure relevant professional resources, how to fully address tasks within an assignment, and how to integrate what they are learning in class into their assignments. Peer Mentor communication is primarily through email serving as a convenient medium to address these issues with students. The Peer Mentor also is available to meet with students face-to-face when needed, as requested. This program, according to evaluation data, suggests students utilizing the program found it to be beneficial for a number of reasons. Perhaps the most significant finding is related to students's self report of their own increased academic improvement. The larger implications of these findings suggest further development of similar programs may help to promote academic success with students, and provide them with appropriate alternatives to faculty support through a familiar and easily accessed medium such as email. There are also benefits to student mentors as they can use this opportunity to enhance their resume, pre professional skills, and connection to peers, faculty, and the department the mentor provides this service at a convenient time, which is typically evenings and weekends. The program provides more time for faculty to address the most pressing needs of students.

### **4. What Factors Put Adolescents at Greater Risk to Use Alcohol, Tobacco, and Other Drugs?**

Karissa Walker (Dept. of Sociology), MSU Moorhead

*Deborah White, Faculty Mentor (Dept. of Sociology), MSU Moorhead*

Adolescent today see using alcohol, tobacco and other drugs as a social norm, but why? Which adolescents are more at risk? This research will look at adolescents and if family structure matters when it comes to the adolescent's risk of participation in alcohol, tobacco, and other drugs. It will also look at, when it comes to adolescents if a certain race is more predisposed compared to other races in the use of alcohol, tobacco, and other drugs. This research is important because society needs to help adolescents get on the right track for the future and give them the proper tools that they need to help fight off the demands of their social group.



## Psychology, Community Psychology, Educational Studies: Elementary & Early Childhood

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### 1. **Impact of a Cultural Partnership on Intercultural Competence of Undergraduates**

Samantha Tupy (Dept. of Psychology), MSU Mankato

Camille McNabb (Dept. of Psychology), MSU Mankato

Elizabeth Lohrenz (Dept. of Government), MSU Mankato

*Elizabeth Sandell, Faculty Mentor (Dept. of Educational Studies: Elementary and Early Childhood), MSU Mankato*

### 2. **Bike Theft Experiment**

Stefanie Peyton (Dept. of Community Psychology), St. Cloud State University

Hilary Packer (Dept. of Community Psychology), St. Cloud State University

*Chaturi Edrisinha, Faculty Mentor (Dept. of Community Psychology), St. Cloud State University*

### 3. **Snatch and Run**

Chad Lanners (Dept. of Community Psychology), St. Cloud State University

Lance Moberly (Dept. of Community Psychology), St. Cloud State University

*Chaturi Edrisinha, Faculty Mentor (Dept. of Community Psychology), St. Cloud State University*

### 4. **Qualitative Analysis of the Impact of a Cultural Partnership on the Cultural Orientation of Undergraduates**

Sadie Liedall (Dept. of Educational Studies: Elementary and Early Childhood), MSU Mankato

Sarah Lieske (Dept. of Educational Studies: Elementary and Early Childhood), MSU Mankato

Erika Koenig (Dept. of Educational Studies: Elementary and Early Childhood), MSU Mankato

*Elizabeth Sandell, Faculty Mentor (Dept. of Educational Studies: Elementary and Early Childhood), MSU Mankato*

**1. Impact of a Cultural Partnership on Intercultural Competence of Undergraduates**

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*Elizabeth Sandell (Dept. of Educational Studies: Elementary and Early Childhood), MSU Mankato*

This study compared changes in the intercultural competency of six groups of undergraduate students in a course, Human Relations in a Multicultural Society. The hypothesis for this study was that the intentional, cross-cultural experiences of students have an impact on the cultural competency of each student. The course in this study was designed as a response to the increasingly diverse population in the United States in terms of race, ethnicity, and culture. Diversity may also refer to behaviors, gender identity, and sexual orientation (IMDiversity, 2010). This course is taught each semester at a MSU Mankato. The course design provided for intercultural partnerships with individuals from diverse populations outside the classroom and for reflection on such interactions. For this study, the population included 150 undergraduate students, between 18 and 35 years old, who voluntarily enrolled. A convenience sample of 70 students registered for 2 sections during fall 2010; 85 students registered for 4 sections during fall 2011. Data was analyzed for participants who completed both the pre-test and post-test during fall 2010 (48) and fall 2011 (80). Research subjects represented students in academic majors such elementary education, social work, and journalism. In the fall semester, 2010, each student completed: (1) minimum of 18 hours service learning at an agency with persons of a culture different than that of the students; (2) team research project resulting in a presentation about a culture different than that of the students; and (3) several self-reflection papers about temperament and course experience. In the fall semester, 2011, the team projects were eliminated. Instead, each student completed a minimum of 9 hours of cultural partnership with a person of a culture different than that of the students' culture. Other requirements, such as service learning and self-reflection papers, were continued. The theoretical basis of the study was the Developmental Model of Intercultural Sensitivity (DMIS) (Bennett, 1998). The Intercultural Development Inventory (IDI) (Hammer and Bennett, 1998 and 2001) was used as a measure of cultural competency. The IDI was completed by subjects at the beginning and at the conclusion of the fall 2010 and the fall 2011 semesters. This provided a process to compare pre-instruction and post-instruction scores for each semester. Data were analyzed to identify the cultural orientation of each student among five stages of the DMIS: Denial, Defense, Minimization, Acceptance, and Adaptation. Researchers found that subjects in fall 2011 showed statistically significant positive gains in overall intercultural sensitivity, when compared to the subjects in fall 2010. This may be attributed to the experience of a cultural partnership in fall 2011.

**2. Bike Theft Experiment**

Stefanie Peyton (Dept. of Community Psychology), St. Cloud State University

Hilary Packer (Dept. of Community Psychology), St. Cloud State University

*Chaturi Edrisinha, Faculty Mentor (Dept. of Community Psychology), St. Cloud State University*

This study examined if people would intervene in the prevention of bike theft or report the theft if they witnessed it. The study was conducted with the collaboration of St. Cloud State Public Safety and St. Cloud State Police Department. We conducted this experiment using a multi-element research design and

controlled for variables such as: a) disguised dress-DD (identity is unclear to others), b) regular dress-RD (identity is clear to others), c) using a key to unlock the bike or d) using a cutter to break the chain, e) gender, f) one bike, and g) multiple bikes (two or more bikes that the thief attempts to cut or unlock). When performing the experiment, the participant would drop the bike off at the designated bike rack, lock the bike to the rack with a chain and walk inside. At which point the thief, either male or female, in either RD or DD, using a key or cutter would remove the chain and steal the bike. Results showed a low frequency of reports. Out of the 25 sessions and 842 people who we recorded as witnesses, only one person reported the theft to the proper authorities i.e., St. Cloud State University Public Safety. Our observations show that the likelihood of someone reporting a bike theft is exceedingly low at the university.

### **3. Snatch and Run**

Chad Lanners (Dept. of Community Psychology), St. Cloud State University

Lance Moberly (Dept. of Community Psychology), St. Cloud State University

*Chaturi Edrisinha, Faculty Mentor (Dept. of Community Psychology), St. Cloud State University*

The current study assessed if a bystander would intervene in the theft of a laptop. The participants were randomly selected from a pool of students who were at the St. Cloud State Library. An ABAB single subject reversal design was used to demonstrate experimental control. During the baseline session, a researcher sat at a table at the library with his/her laptop for 10 minutes with the participant and made brief contact (e.g., said “hello”). Once ten minutes had elapsed, the researcher left the table for 8 minutes. Another researcher, posing as a thief, came and stole the laptop at the fifth minute in the 8-minute interval. The first researcher (laptop owner) returned once the 8-minute interval had elapsed. Observers recorded if the participant intervened or did not intervene in the theft. During the treatment sessions, neon yellow signs were displayed that read, “Theft Alert”, on the library tables prior to the library opening for the day. Once the participant was selected, the baseline procedure was replicated once more to demonstrate experimental control. A total of 24 sessions were conducted with 20 participants. Baseline and treatment sessions were alternated every five sessions. During baseline, it was found participants were not likely to intervene but will inform the victim of the theft. During intervention, this trend continued. Of 24 sessions, only 1 participant intervened in theft prevention. These results are consistent with other studies across college campuses that show similar results of bystander apathy.

### **4. Qualitative Analysis of the Impact of a Cultural Partnership on the Cultural Orientation of Undergraduates**

Sadie Liedall (Dept. of Educational Studies: Elementary and Early Childhood), MSU Mankato

Sarah Lieske (Dept. of Educational Studies: Elementary and Early Childhood), MSU Mankato

Erika Koenig (Dept. of Educational Studies: Elementary and Early Childhood), MSU Mankato

*Elizabeth Sandell, Faculty Mentor (Dept. of Educational Studies: Elementary and Early Childhood), MSU Mankato*

This study compared changes in the Cultural Orientation of four groups of undergraduate students in a course, Human Relations in a Multicultural Society. The hypothesis for this study was that the intentional, cross-cultural experiences the students experienced in the course did have an impact on the Cultural Orientation of each student. A convenience sample of 85 students registered for 4 sections during fall

2011. The course design provided for intercultural partnerships with individuals from diverse populations outside the classroom and for reflection on such interactions. Each student completed (1) minimum of 18 hours service learning at an agency with persons of a culture different than that of the students, (2) a minimum of 9 hours of cultural partnership with a person of a culture different than that of the students, and (3) several self-reflection papers about temperament and course experiences. The Intercultural Development Inventory (IDI) (Hammer and Bennett, 1998 and 2001) was used as a measure of Cultural Orientation. The IDI was completed by subjects at the beginning and at the conclusion of the semester. The two researchers coded two reflection papers according to the five stages of Cultural Orientation described by the IDI. The two researchers compared their own scores of the papers to determine inter-rater reliability and also compared their scores of the papers with the subjects' scores on the IDI.

## Art 2

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**1. Painting: Proximity and Reach**

Tyler Abrahamson (Dept. of Art), MSU Mankato

*Brian Frink, Faculty Mentor (Dept. of Art), MSU Mankato*

**2. Watching Paint Dry**

Samantha Allen (Dept. of Art), MSU Mankato

*Brian Fink, Faculty Mentor (Dept. of Art), MSU Mankato*

**3. The Hierarchy of Rococo Women Seen Through Fashion in Paintings**

Sanda Brighidin (Dept. of Art), MSU Mankato

*Curt Germundson, Faculty Mentor (Dept. of Art), MSU Mankato*

**4. Voices of the Flesh**

Hope Their (Dept. of Art), MSU Mankato

*Brian Frink, Faculty Mentor (Dept. of Art), MSU Mankato*

**1. Painting: Proximity and Reach**

Tyler Abrahamson, (Dept. of Art), MSU Mankato

*Brian Frink, Faculty Mentor, (Dept. of Art), MSU Mankato*

Most paintings have a preferred viewing distance on average from 3 to 15 feet and directly in front of the painting; I call this the “reach”. In this series of paintings I explore the physical reach a painting has with its viewer. My intention with this series of works is to expand the paintings reach to further encapsulate the viewer literally and as usual, cognitively. I have done this by allowing works to communicate directly with one another, sometimes across spaces on the wall or floor and sometimes even across a room. The proximity, imagery, color and composition allow the viewer to easily distinguish works that relate to one another. In a sense, I want to communicate the reach of the paintings in a similar fashion to 3-dimensional art.

**2. Watching Paint Dry**

Samantha Allen (Dept. of Art), MSU Mankato

*Brian Fink, Faculty Mentor (Dept. of Art), MSU Mankato*

How can paint be used as more than just a material but as a subject in itself? In my work paint is more than just a material, it is a surface. By pouring paint onto plastic I create more of a sculptural work than if I were applying it with a brush. Changing the way I apply it alters the way the viewer responds to the painting. I want to challenge the viewer. By challenging the viewer, I create a more engaging relationship with the piece, the viewer and the audience. It is critical to me to stretch the idea of painting to its limits. I want the paint to consume, and hold the work together. By pouring paint I give up control and let the paint move and mix on its own. I allow myself to paint a single moment that will exist in time forever. After taking the paint off the plastic I arrange the work onto the plastic into a shape of my choosing. It opens up very different ideas of what the definition of painting should be, and even the definition of beauty. It gives me the opportunity to break down barriers and explore my own definition of painting.

**3. The Hierarchy of Rococo Women Seen Through Fashion in Paintings**

Sanda Brighidin (Dept. of Art), MSU Mankato

*Curt Germundson, Faculty Mentor (Dept. of Art), MSU Mankato*

The style of Rococo evokes a variety of feminine attributions; women were usually depicted in works of art in a decorative manner. Many of the interpretations of these paintings focus on the luxurious clothes and lavish backgrounds. Artists like Jean-Antoine Watteau and Francois Boucher were responsible for perpetuating a very elegant view of Rococo women within the public’s eyes. But there were also depictions of non-aristocratic women that were geared more to the middle class (bourgeois). After reading a number of articles and books on Jean-Baptiste-Simeon Chardin, and visiting the Louvre in Paris, I became aware that his works were usually of women engaged in the activities of daily life and household work. I want to argue that a detailed study of fashion within paintings can tell a lot about the different social classes and hierarchies of 18th century France. I had the opportunity to explore the differences between the social classes by also visiting the palace of Versailles, which allowed me to experience the luxurious side of the life of aristocratic women of the Rococo. As a result of my research I became aware



of not just Chardin's representations of bourgeois life, but also of other artists who were engaged in depicting a side of 18th century life different from that shown by artists such as Watteau and Boucher. The visit to the museums and the books I have read demonstrated the role played by Chardin's work as an alternative to the luxurious Rococo style.

#### **4. Voices of the Flesh**

Hope Their (Dept. of Art), MSU Mankato

*Brian Frink, Faculty Mentor (Dept. of Art), MSU Mankato*

The purpose of this project is to seek a personal and metaphorical connection to the women of my past through the symbolic performative act of scrubbing and abolishing the surface I am painting them on. Through this act I am fostering a relationship between the paint and the idea of women having their presence and history erased. By first painting the women in a more photo-realistic manner and then altering them, through the process of scrubbing, into ghostly images I will show where they were then and where they are now. I am fusing the act of scrubbing with the process of painting, thus re-contextualizing the formal choices in nature made through the removal of paint and addition of mark making with a scrubbing brush. The performative act is a way for me to experience the physical drudgery and trials they withstood, such as the domestic duties that have been associated with women, and to make a record of that action. I feel this act of scrubbing is a metaphorical comment on women, their roles and their history. By doing so my goal is to make the viewer examine how they see women.



English, English & Global Studies, Communication Studies

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**1. Skimming: A Comparison of the Use of Reading Strategies between Skilled Readers and Less Skilled Readers**

Yoshimi Nakayama (Dept. of English), St. Cloud State University

*Isolde Mueller, Faculty Mentor (Dept. of English), St. Cloud State University*

**2. The Negative Effects of Anzen Shinwa on the Great Tohoku Earthquake**

Tamara Sprinkle (Dept. of English and Global), St. Cloud State University

*Mikhail Blinnikov, Faculty Mentor (Dept. of English and Global), St. Cloud State University*

*John Ness, Faculty Mentor (Dept. of English and Global), St. Cloud State University*

**3. Cultural Significance of Chinese Lanterns in China: Hanging, Floating, and Flying**

Jessica Stock (Dept. of Communication Studies), St. Cloud State University

*Margaret Pryately, Faculty Mentor (Dept. of Communication Studies), St. Cloud State University*

**4. Korean Adoptees' Experiences and Their Connection to Racial and Ethnic Identity**

Max Forbord (Dept. of Communication Studies), MSU Mankato

*Sachi Sekimoto, Faculty Mentor (Dept. of Communication Studies), MSU Mankato*

**1. Skimming: A Comparison of the Use of Reading Strategies between Skilled Readers and Less Skilled Readers**

Yoshimi Nakayama (Dept. of English), St. Cloud State University

*Isolde Mueller, Faculty Mentor (Dept. of English), St. Cloud State University*

In Japan, the contact that students have with English in their daily life is very limited. Hence, reading texts in their second language (L2) is a challenging task for the students. Often, people who use English as a second language are not good at comprehending a text as a whole. They tend to read English sentences in small sets of meaning. Skimming is one of the strategies that are used to help readers grasp the main idea of a paragraph. Observing students' use of skimming therefore is a potential key to see what the strategies are for successful reading. In this study, I compare the use of skimming by skilled and less skilled readers and compare the readers' comprehension of the text, as documented in the think-aloud-research method. Six first-year-university students were selected as participants in the study; based on their scores from a reading section of the placement test for ESL classes. Three students are skilled readers and three other students are less skilled readers. By comparing the use of reading strategies between skilled readers and less skilled readers, I investigate whether skimming improves reading comprehension. In turn, I investigate how the results of this study can be applied for teaching reading strategies in the classroom.

**2. The Negative Effects of Anzen Shinwa on the Great Tohoku Earthquake**

Tamara Sprinkle (Dept. of English and Global), St. Cloud State University

*Mikhail Blinnikov, Faculty Mentor (Dept. of English and Global), St. Cloud State University*

*John Ness, Faculty Mentor (Dept. of English and Global), St. Cloud State University*

The March 11, 2011 Earthquake in Japan is considered one of the three greatest Japanese earthquakes of this century. As 10% of all earthquakes the world occur in the island nation of Japan, Japan is no stranger to earthquakes or the following tsunamis. For this reason, Japan was better equipped than countries such as Haiti in dealing with a mega-earthquake as a result of the lower death toll. However, despite the frequency of these natural disasters, many measures taken to prevent damage from earthquakes and tsunamis failed to do their intended job. This is particularly notable in the case of the Dai-ichi Fukushima Power Plant which came to overshadow the massive destruction of the tsunami in Iwate, Miyagi, and Fukushima. The Japanese Government and electric companies have used 安全神話 Anzen Shinwa, the myth of safety to stifle open conversation about the risk of power plants in the case of an earthquake or tsunami. This false idea of safety has decreased Japan's ability to protect themselves from mega-earthquakes. This article explores the scope of devastation by this mega-earthquake, how the idea of Anzen Shinwa 安全神話 negatively affected Japan's ability to prevent and respond to this disaster, how this has affected sentiment about the government and TEPCO, and what can be done to prevent a disaster of this magnitude.

### **3. Cultural Significance of Chinese Lanterns in China: Hanging, Floating, and Flying**

Jessica Stock (Dept. of Communication Studies), St. Cloud State University

*Margaret Pryately, Faculty Mentor (Dept. of Communication Studies), St. Cloud State University*

Many Chinese paper lanterns, whether hanging, flying, or floating, are now used all around the world as just a fun, artistic way to celebrate a wedding, holiday, or for the Chinese New Year. But, most people fail to realize the significance and the symbolism behind these beautiful lanterns. Throughout Chinese history these lanterns have not only changed in appearance, they have also changed in significance. This presentation will endeavor to explain the true historical meaning of these wonderful lanterns. I have researched eight articles to complete my project. By understanding the evolution in meaning of the Chinese lantern, though a small object, we may come to appreciate the significance of daily unappreciated objects.

### **4. Korean Adoptees' Experiences and Their Connection to Racial and Ethnic Identity**

Max Forbord (Dept. of Communication Studies), MSU Mankato

*Sachi Sekimoto, Faculty Mentor (Dept. of Communication Studies), MSU Mankato*

Agathon (2011) states that in 2010, more than one million adoptees had been involved in international adoption, and approximately 200,000 of them came from South Korea. There are a growing number of international adoptions from South Korea ever since the end of Korean War in 1953. However, there is very little research about Korean adoptees' experiences and how those experiences form their racial and ethnic identity. The purpose of research is to explore the significant life experiences of Korean adoptees and examine how their experiences have shaped their racial and ethnic identity. For this research, racial identity is defined as a sense of group identity based on one's perception that he/she shares with a particular racial group, and ethnic identity is defined as a social identity based on the culture of one's national group. I will conduct case studies of 3-5 Korean adoptees through in-depth face-to-face interviews. Some of the themes I hope to address from the case studies include: 1.) How Korean culture has influenced the adoptees, 2.) How mainstream American culture has influenced the adoptees, 3.) How Korean adoptees experience stereotypes and racism in the United States, and 4.) How Korean adoptees identify themselves as a member of their racial and ethnic group. I hope to gain a better understanding of Korean adoptees and their exploration of racial and ethnic identity in order to help further the research on interracial and international adoption.



## International Studies, Marketing, International Business, Government

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**1. Human Rights Education: Promoting Peace Through Life-Long Understanding**

Jessica Delaney (Dept. of International Studies), MSU Moorhead

*Andrew Conteh, Faculty Mentor (Dept. of Political Science), MSU Moorhead*

**2. Strategic Marketing Research Through Use of a Simulation**

Faruk Husejnovic (Dept. of Marketing), MSU Moorhead

Monica Nelson (Dept. of Marketing), MSU Moorhead

*Ruth Lumb, Faculty Mentor (Dept. of Marketing), MSU Moorhead*

**3. More to See: A Case for Globalization**

Ajay Kapadia (Dept. of International Business), MSU Mankato

*Richard Young, Faculty Mentor (Dept. of International Business), MSU Mankato*

**4. The Arab Spring: The Challenge and Response to Arab Authoritarianism**

Jordan Teslow (Dept. of Government), MSU Mankato

*Abdalla Battah, Faculty Mentor (Dept. of Government), MSU Mankato*

**1. Human Rights Education: Promoting Peace Through Life-Long Understanding**

Jessica Delaney (Dept. of International Studies), MSU Moorhead

*Andrew Conteh, Faculty Mentor (Dept. of Political Science), MSU Moorhead*

In light of the past decade of seemingly continuous conflict and revolt, two crucial questions emerge: Why in this century does there remain a lack of respect for the dignity of humanity in political and economic affairs worldwide? Is there an effective way to address the problem at its source? Human Rights Education (HRE) was officially recognized by the international community in the monumental December 2011 passage of the United Nations Declaration of Human Rights Education and Training as a key to success for promoting peace, security and human development. The integration of HRE into primary and secondary education programs has great potential to reshape the dynamics of local, domestic and international relations by instilling an understanding, value and respect for human rights in generations of children who will grow to become citizens, business leaders and decision-makers in a globalized society. In the following paper and presentation, we begin with a brief summary of the development and history of HRE, then move to discuss the substance and relevance of the Declaration, its reception among various nations with particular attention to the United States, and its implications for human rights in both the developed and developing world.

**2. Strategic Marketing Research Through Use of a Simulation**

Faruk Husejnovic (Dept. of Marketing), MSU Moorhead

Monica Nelson (Dept. of Marketing), MSU Moorhead

*Ruth Lumb, Faculty Mentor (Dept. of Marketing), MSU Moorhead*

Through the use of a simulation, this presentation shows how marketing research is conducted in a firm. The simulation is based on a large international electronics firm entering the microcomputer business. It has formed a new PC Marketing Division to pursue this business opportunity. In order to succeed in a fast-paced market where customers are demanding and the competition is attempting to take away business, marketing research must be undertaken. We will show how research enables marketers to analyze a situation, plan a strategy to improve it, and then execute that strategy into the future while facing uncertainty from the outside environment. The interplay among marketing, manufacturing, logistics, human resources, finance, accounting, and team management is stressed. The simulation provides a 'real-world' example of trade-offs and potential outcomes of various decisions. Through this simulation we learned how to make decisions in ways that would be most profitable for the firm. The requirements included market opportunity analysis, brand development, advertising, pricing, sales force management, and profitability analysis.

**3. More to See: A Case for Globalization**

Ajay Kapadia (Dept. of International Business), MSU Mankato

*Richard Young, Faculty Mentor (Dept. of International Business), MSU Mankato*

Globalization is the process of increased interconnectedness among countries most notably in the areas of economics, politics, and culture. Until these last few years, globalization has come under great scrutiny. However, many people still argue in the defense of globalization. This paper investigates one particular



benefit of this process, the diffusion of knowledge, but from the lens of a visual culture perspective. This investigation will observe the roots of international trade that can be traced as far back as the Roman Empire, the opening of Africa during the years of the Weimar Republic, and artistic trends that we see today. The word “diffusion” simply means to spread out, and that is exactly what any newfound knowledge does. From this exchange of knowledge, we can certainly see that globalization expands dialogue on the moral complexity of the human experience, which can lead to better understanding of our global society.

#### **4. The Arab Spring: The Challenge and Response to Arab Authoritarianism**

Jordan Teslow (Dept. of Government), MSU Mankato

*Abdalla Battah, Faculty Mentor (Dept. of Government), MSU Mankato*

The ongoing political turmoil in the Middle East represents a paradigm shift from dictatorship to a more open society. This promises to have a profound impact on US relations with the region for years to come. My research offers analyses of the socio-economic conditions that underpin these uprisings. These uprisings can be seen as analogous to the collapse of the Soviet Union and its satellite states in the 1980s-90s. In both the Middle East and Eastern Europe regimes broke down after a collapse of popular support or acceptance. This study relies on a compilation of relevant newspaper articles, statistics from both governments and NGOs. My chief contention is that economic mismanagement and autocratic methods by Arab dictators spurred the Arab Spring. Each country however, has unique circumstances that either hinder or hasten the success of the revolutionary movements.



## Nursing, Human Performance

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**1. Importance of Family Centered Care for Undergraduate Nursing Students**

Shamso Khandid (Dept. of Nursing), MSU Mankato

*Stacey VanGelderren, Faculty Mentor (Dept. of Nursing), MSU Mankato*

*Norma Krumwiede, Faculty Mentor (Dept. of Nursing), MSU Mankato*

**2. Transcultural Nursing in Huehuetenango, Guatemala**

Amy Lavalla (Dept. of Nursing), MSU Moorhead

*Sarah Pangarakis, Faculty Mentor (Dept. of Nursing), MSU Moorhead*

**3. Against the Grain: Revealing the Other Side of Soy**

Sheri Stiles (Dept. of Nursing), Metropolitan State University

*Kris Frykman, Faculty Mentor (Dept. of Communication, Writing, and the Arts), Metropolitan State University*

**4. Beyond Limits: Exploring Motivation and Gender Barriers in Ultramarathonning**

Amy Harris (Dept. of Human Performance), MSU Mankato

*Cindra Kamphoff, Faculty Mentor (Dept. of Human Performance), MSU Mankato*

**1. Importance of Family Centered Care for Undergraduate Nursing Students**

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The purpose of this descriptive qualitative research study is to understand the perception of undergraduate nursing students on the importance of providing family centered care. Achieved data from a prior nursing simulation research study will be used to answer two research questions:

1. How important is it for the nurse to engage with families?
2. How important is it to include the family in nursing education for students?

The findings will inform nurse educators if the current method of teaching impacts the students' opinions on the importance of family centered care. Understanding the student's perception will assist in developing new methods of teaching a family approach in nursing practice. Knowing what students think of family centered care assists educators to better understand if simulation changes the students' view of the family approach in nursing practice. Family centered care is beneficial for students when gathering useful information to better serve patients. Nurse educators believe that case-based nursing simulations are an effective teaching-learning strategy that promotes the learning for students on how to apply a family approach in their nursing practice. After experiencing two different simulations; one on family centered nursing practice and the other a lack of the family approach, students will be able to take a legitimate position on whether or not family centered care is important. The study would enrich both the students in coming to an informed decision of the importance of family and also aid educators in finding innovative methods of teaching family centered care.

**2. Transcultural Nursing in Huehuetenango, Guatemala**

Amy Lavalla (Dept. of Nursing), MSU Moorhead

*Sarah Pangarakis, Faculty Mentor (Dept. of Nursing), MSU Moorhead*

Nurses are an integral part of volunteer medical outreach programs collaborating to serve health needs nationally and internationally. This spring over 100 volunteer Minnesotans from Helps International, a non-profit organization that strives to provide a variety of programs for individuals, traveled to Huehuetenango Guatemala to provide necessary health services. A temporary clinic and hospital were set up where local residents could travel to receive free medical services. Together with the health care teams, nurses saw over 1404 patients in the clinic and recovered over 183 post operative surgical patients. Nurses worked closely with Mayan family members, Spanish translators, and Helps staff, to comfort and care for patients who may not have been able to receive care if not for international outreach hospitals. Medical outreach trips such as these act to serve individuals who have a great need and are unable to satisfy those needs through traditional means. This presentation will discuss some of the nursing aspects related to the health issues treated and resolved during that trip, and nursing's impact on the individuals. By nurses becoming involved in healthcare outreach programs, global health can be improved and strides can be made towards meeting the United Nations Millennium Development Goals.

### **3. Against the Grain: Revealing the Other Side of Soy**

Sheri Stiles (Dept. of Nursing), Metropolitan State University

*Kris Frykman, Faculty Mentor (Dept. of Communication, Writing, and the Arts), Metropolitan State University*

What if we were told that by eating a certain food we could lose weight, protect our heart, lower our cholesterol, have more energy, and reduce the symptoms of menopause, among many other reported benefits, sounds like a no-brainer, right? Well, those claims are in fact that of soy. With the help of doctors, nutritionists, health professionals, and a huge push in marketing, soy has been publicized as the “miracle” health food. However, I would have to respectfully disagree with labeling soy a “miracle” health food, in fact, disagreeing with the entire mainstream diet that includes soy. Not without controversy, would I have to argue the negative effects soy has on the body. Those who propose its benefits fail to acknowledge that non-fermented soy, or genetically modified (GM) soy, which accounts for almost all soy products on the market today, yields antinutrients that basically act as stimuli on the cells in the body causing them to become over excited, and die. I will discuss the antinutrients, vitamin and mineral deficiencies, and isoflavones (estrogens) found in soy products that are producing detrimental effects within the body.

### **4. Beyond Limits: Exploring Motivation and Gender Barriers in Ultramarathoning**

Amy Harris (Dept. of Human Performance), MSU Mankato

*Cindra Kamphoff, Faculty Mentor (Dept. of Human Performance), MSU Mankato*

An ultramarathon extends beyond the traditional 26.2-mile marathon (Tharion, Strowman, & Rauch, 1988) and includes 50 kilometers (31 miles), 100 kilometers (62.1 miles) and 135 miles. Participants must train for substantial periods of time and oftentimes in rough off-road terrain while dealing with dramatic changes in elevation and weather. Despite these challenges, participation rates are increasing; yet, most of these participants are men. For instance, for every woman participant, five men participated in the Western States 100 (Western State Endurance Run, 2012). Very few researchers have examined the motives to participate in this unique sport or investigated the gender barriers of ultramarathons. This qualitative study was conducted to further explore and understand what motivates women to run ultramarathons and the gender barriers that may prevent or make it difficult for them to participate in ultramarathons. Telephone interviews were conducted with fifteen women who completed at least one ultramarathon. The interviews were recorded and transcribed verbatim. The transcripts were read in-depth and organized into common themes across all interviews using Creswell’s (2000) framework. Gender barriers in ultramarathons were identified as: 1) child-care and household responsibilities, 2) job-related obstacles, 3) lack of support, 4) safety concerns and 5) biological barriers such as the menstrual cycle. To overcome gender barriers, these women commonly stated they used the following as motivation to continue ultramarathoning: 1) the ultra-running community, 2) the challenge of the ultra, 3) environmental factors, and 4) personal growth. Specific results and implications of our findings will be discussed in the presentation.

## **Driving Directions to Minnesota State University Mankato**

### **From the North**

Travel south on Highway 169 to Mankato. Take the Riverfront Drive exit. Turn left (north) onto Riverfront Drive and continue to Stoltzman Road. Turn right (east) onto Stoltzman Road and continue until you get to Stadium Road. Turn left onto Stadium Road and continue up the hill to Ellis Avenue. Turn left onto Ellis Avenue. The Visitors Pay Lot 4 entrance is on the left (west) side of the street.

### **From the South**

Travel north on Highway 169 to Mankato. Take the Riverfront Drive exit. Turn right (north) onto Riverfront Drive and continue to Stoltzman Road. Turn right (east) onto Stoltzman Road and continue until you get to Stadium Road. Turn left onto Stadium Road and continue up the hill to Ellis Avenue. Turn left onto Ellis Avenue. The Visitors Pay Lot 4 entrance is on the left (west) side of the street.

### **From the East**

Travel west on Highway 14 to Mankato. Take the Highway 22 exit and travel south on Highway 22 to Highway 83. Turn right (west) onto Highway 83 and continue to Victory Drive. Turn left (south) onto Victory Drive and continue to Stadium Road (this will be the first turn on the right). Turn right (west) onto Stadium Road and continue to Ellis Avenue. Turn right onto Ellis Avenue. The Visitors Pay Lot 4 entrance is on the left (west) side of the street.

### **From the West**

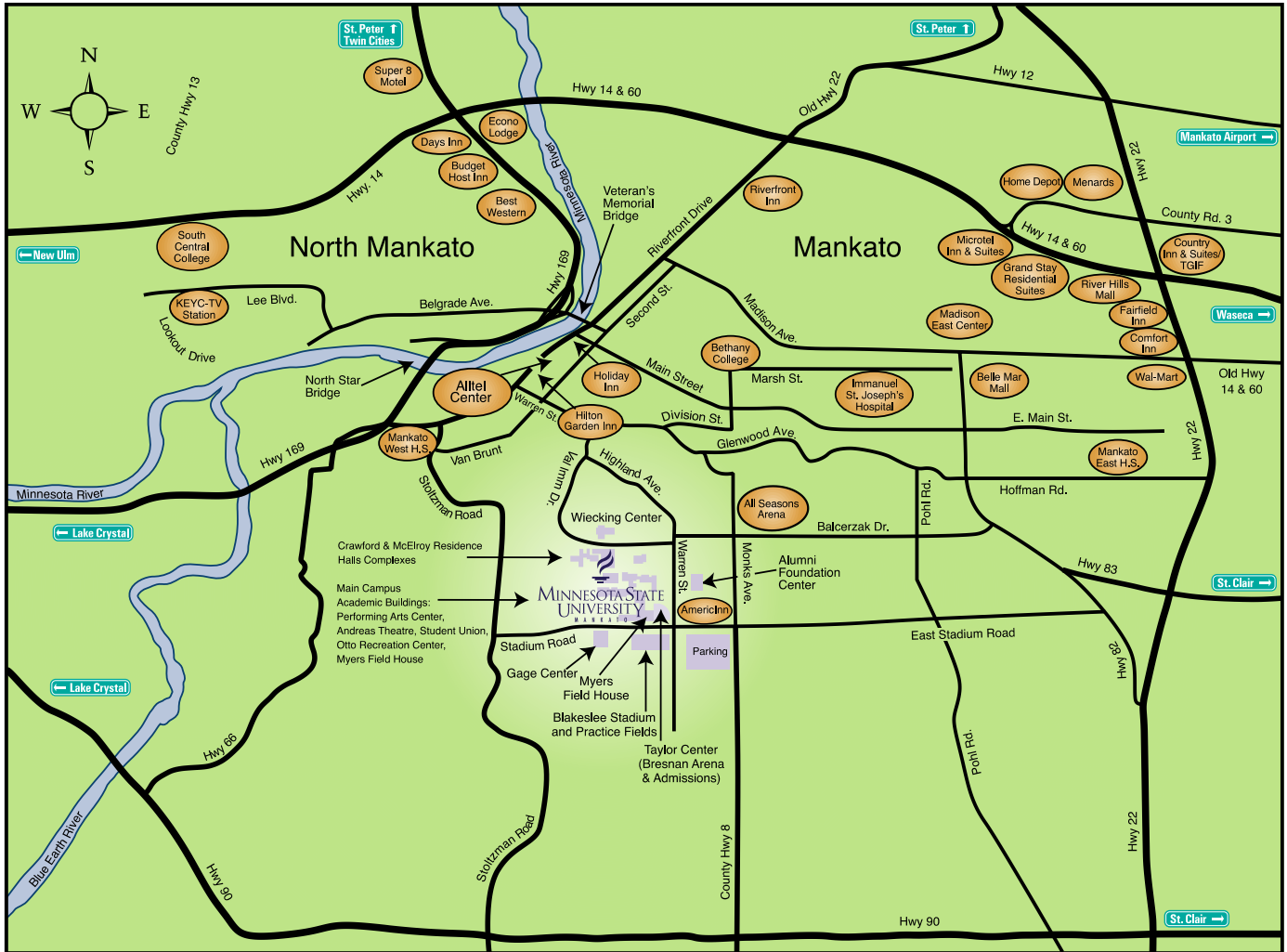
Travel east on Highway 14 to Highway 169. Take the Highway 169 South exit. Turn right (south) onto Highway 169. Take the Riverfront Drive exit. Turn left (north) onto Riverfront Drive and continue to Stoltzman Road. Turn right (east) onto Stoltzman Road and continue until you get to Stadium Road. Turn left onto Stadium Road and continue up the hill to Ellis Avenue. Turn left onto Ellis Avenue. The Visitors Pay Lot 4 entrance is on the left (west) side of the street.

### **Buses**

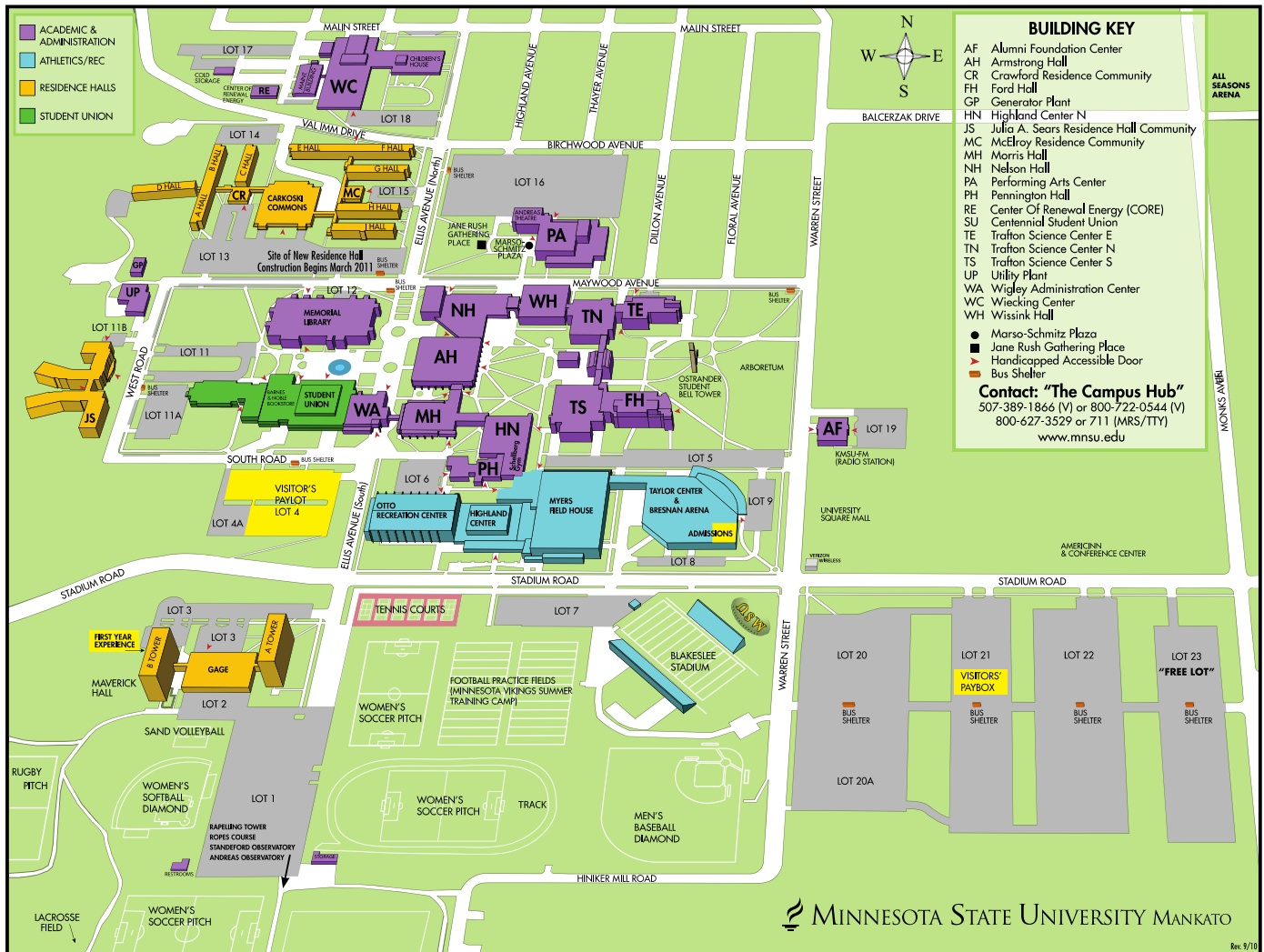
The buses will drop off in front of the Student Union and park in Lot 22 South End.

# Map of Greater Mankato, Minnesota

Main Roadways and Streets to Minnesota State University, Mankato



# Campus Map



MINNESOTA STATE UNIVERSITY MANKATO

Rev. 9/10

This document is available in alternative format to individuals with disabilities by calling "The Campus Hub" at the above numbers. A member of the Minnesota State Colleges and Universities System. Minnesota State University, Mankato is an affirmative Action/Equal Opportunity University.



# Restaurants within walking distance to MSU

Chipotle–Fresh Mexican



Noodles & Co–Pasta

Leeann Chin–Chinese



Cold Stone Creamery—Ice Cream

Weggys–Bar and Grill



Jimmy Johns–Sandwiches

Johnny B's—Bar and Grill

BoomTown—Bar and Grill



Berry Blendz—Smoothie shop

