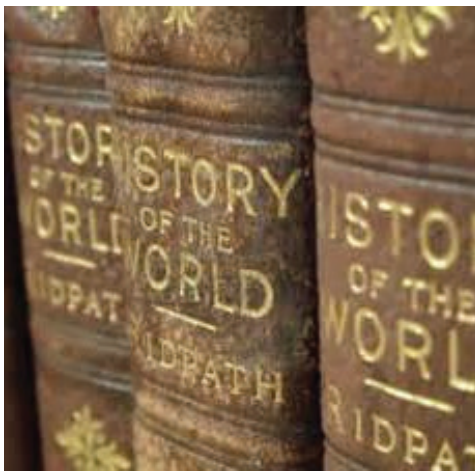


5th Annual Minnesota Conference of
**UNDERGRADUATE SCHOLARLY
and CREATIVE ACTIVITY**
Monday April 4, 2016



Welcome to the Fifth Annual Minnesota Conference of Undergraduate Scholarly and Creative Activity

Minnesota Undergraduate Research Council

Bemidji State University, Angela Fournier
Inver Hills Community College, David Higgins
Metropolitan State University, Jennifer Schultz, Sumiko Otsubo
Minneapolis Community and Technical College, Renu Kumar
Minnesota State University Moorhead, Oscar Flores
Minnesota State University, Mankato, Karla Lassonde
St Cloud State University, Carrie Barth, Jodi Kuznia
Southwest Minnesota State University, Emily Deaver
Winona State University, Mingrui Zhang, Jana Craft
Rochester Community and Technical College, Heather Sklenicka



MINNESOTA STATE UNIVERSITY
MOORHEAD.



MINNESOTA STATE
UNIVERSITY
MANKATO



It gives me great pleasure to introduce you to the Fifth Annual Undergraduate Scholars Conference, which celebrates undergraduate research at Minnesota State Colleges and Universities. The conference fosters collaboration and partnership as undergraduate students and faculty mentors from nine universities and three community and technical colleges meet in Winona to share projects from a broad range of disciplines.



Our colleges and universities provide students with an extraordinary education that meets their personal and career goals, enhances the quality of life for all Minnesotans, and sustains vibrant communities throughout the state. Hands-on research experience not only enables our students to participate in the process of discovery, it also builds curiosity, creativity, imagination, and teamwork.

This annual conference marks a milestone for students to celebrate and share their discoveries and to celebrate the collaboration among our colleges and universities.

Thank you for participating in the 2016 MnSCU Undergraduate Scholars Conference.

A handwritten signature in black ink that reads "Steven Rosenstone". The signature is written in a cursive style with a large, stylized initial "S".

Steven Rosenstone

Chancellor, Minnesota State College and Universities



Welcome to the Fifth Annual MnSCU Undergraduate Scholars Conference. It is a great honor for Winona State University to host this conference. It is our hope that the presence of this event on the campus of WSU will aid in the continued growth and success of undergraduate research throughout MnSCU.

Winona State University holds, as part of our mission, to be "a community of learners improving our world." This is reflected in our commitment to undergraduate research across the entire campus. This community begins with the collaboration of an undergraduate student and faculty mentors as they work to address issues relevant to their discipline. The community grows through students sharing their work with other students, faculty, and citizens of the Winona area at our annual

Judith Ramaley Celebration of Research and Creative Scholarship, which is now in its 10th year. This year, we have the good fortune to expand this community to other students and faculty within the MnSCU system! Our hosting the conference will further instill the significance of undergraduate research across our campus and beyond through the exchange of ideas, methods, and views of the many fields of study found across our campuses.

We are proud to host the MnSCU Undergraduate Scholars Conference and committed to doing our part in making this conference a showcase that demonstrates the value of research to our educational programs.

Sincerely,

A handwritten signature in black ink, which appears to read "S. Olson". The signature is fluid and cursive.

Scott R. Olson
President, Winona State University

Acknowledgement

This event would have not been possible without support provided at Winona State University and the administration, staff, and faculty of MnSCU and our sister institutions. Thanks to President Scott Olson and Provost Pat Rogers for providing financial support and for their commitment to undergraduate research. We are also very appreciative of the continued support by Ron Anderson of the MnSCU office of Academic and Student Affairs. Ann Durley and Blandine Berthelot, WSU Office for Camps and Conferences, provided all logistical support from registration to campus housing (and everything in between). Stephanie Smidt, Student Union, provided excellent support in helping us identify the best spaces to use for the conference and were tolerant of modifications made along the way. Patricia Malotka and Sarah Delano, Marketing and Communications, designed the conference program, built and maintained the conference website, and we also thank them for the many additions we requested along the way. As always, the staff of Facilities Services provided excellent support setting up the event. We also thank Teaching, Learning, and Technology Services for preparing laptops for student presentations, and Susan McDonnell of Computer Science for providing technical support on-site.

Of course, the conference would not be possible without the students and faculty of the MnSCU institutions for their commitment to quality education and the initiative to engage research and creative scholarship as part of the educational experience. This includes the members of the MnSCU Undergraduate Scholar organizing council whose insights and passion for undergraduate research and scholarships have developed and sustained this celebration of our students.

Sincerely,

Mingrui Zhang, Ph. D.
Professor of Computer Science

Jana Craft, Ph.D.
Assistant Professor of Business
Administration



SUNDAY, APRIL 3rd

6:00 p.m. – 8:00 p.m. Check-in for overnight guests
Tau Center, West Campus

MONDAY, APRIL 4th

7:30 a.m. – 11:00 a.m. Registration
Kryzsko Commons, East Hall

7:30 a.m. – 8:45 a.m. Poster set up, Breakfast
Kryzsko Commons, East Hall

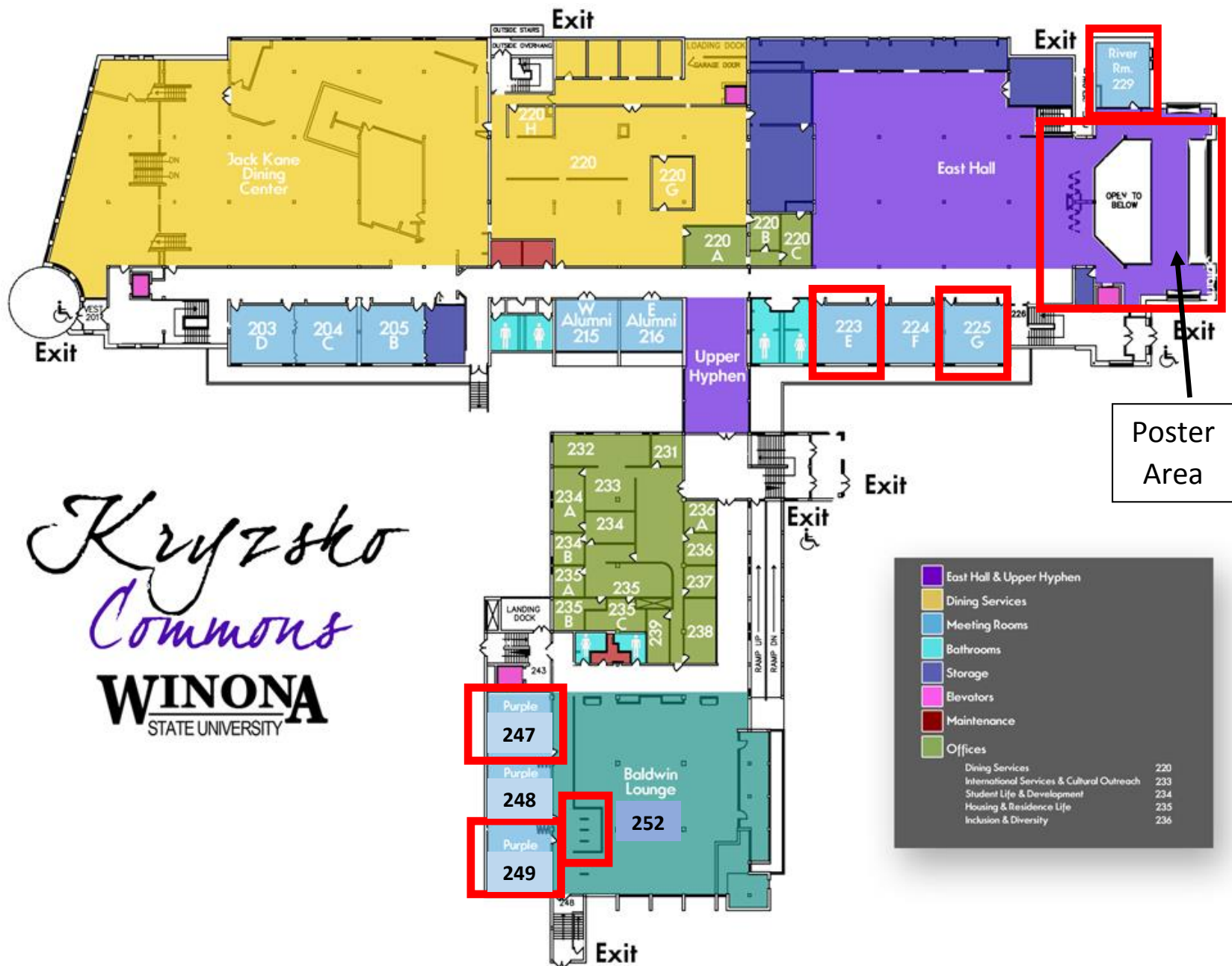
8:45 a.m. – 11:15 a.m. Oral Session
Rooms 223, 225, 247, 249

11:15 a.m. – 12:15 p.m. Poster Session I
Kryzsko Commons, East Hall

12:15 p.m. – 1:15 p.m. Lunch Break
Kryzsko Commons, East Hall

12:30 p.m. – 1:00 p.m. Patricia Rogers, Provost and Vice President for
Academic Affairs, Winona State University

1:15 p.m. – 2:15 p.m. Poster Session II
Kryzsko Commons, East Hall



8:45 – 11:15 a.m.

ORAL SESSION

Room 223

Moderators: **Suzanne Nielsen and Jennifer Schultz**

PRESENTATION #2: **Sarah Andrewson**

What a Star Looks Like: The Male Gaze and Patriarchal Narratives in Dreamgirls and Sunset Boulevard

PRESENTATION #10: **Annie Burkhart**

She Made the Ultimate Sacrifice”: Examining the Obscured Identity of Betty Heslop in P.J. Hogan's Muriel's Wedding (1994)

PRESENTATION #24: **Amber Godfrey and Darren A. Miller II**

Determining the Benefits of Alternative Haircare Conditioning Practices

PRESENTATION #63: **Monica Villarreal**

Therapeutic Benefits of Art Therapy with Older Adults with Dementia

PRESENTATION #9: **Christopher Boone, Jordan Morgan, and Yunuke Nyanamba**

Down the spine of the Mississippi: Our experience with coastal and community restoration

PRESENTATION #52: **Katherine Rasley**

Hybrid Renewable Power Systems: Analysis of Feasibility and Design

Room 225

Moderators: **Heather Sklenicka and Karla Lassonde**

PRESENTATION #5: **Brandon Baer**

Methods for Characterization of Carbonaceous Meteorites

PRESENTATION #25: **Leandro Gomes Aguiar**

Assembly line balancing using linear programming

PRESENTATION #39: **Tyler Massey and Randall Riehl**

Fossil fuel free ice fishing house

PRESENTATION #42: **Flint Million**

Evaluating the Advantages of Braille Display Technology in Software Development

PRESENTATION #48: **Phillip Oswald**

Survival of walleye eggs in Upper Red Lake and the Tamarac River

PRESENTATION #23: **Molley Glidden**

Functional and Technical Ingredient application in the product development for RCA competition

PRESENTATION #64: **Jeffrey Witthuhn**

(0,1) Matrix-vector product via Minimum Spanning Trees

Room 247

Moderators: **Grace Anderson and Angela Fournier**

PRESENTATION #8: **Christopher Boone**

What influences, outside of the classroom, determine a student's involvement in student organizations on-campus?

PRESENTATION #13: **Amadou Cisse**

How Does The Minimum Wages Affect Teen's Unemployment, Time Series Analysis

PRESENTATION #21: **Jennifer Gauerke and Alexandra Dewey**

Perfectionism and Weight-Related Behaviors Among College Students

PRESENTATION #22: **Stephanie Geier and Mu Mu Aye**

Collecting and Analyzing Personal Narratives: A Summary of the Marshall Area Migrant Voices Project

PRESENTATION #35: **Gabriella Lara**

The Imagined Day

PRESENTATION #53: **Songha Reu**

Academic Intervention and High School Completion for At-Risk Students: PSEO (Post Secondary Enrollment Options Program)

PRESENTATION #46: **Jordan Morgan**

Imagining A Tomorrow With a Fossil Fuel Free Endowment

Room 249

Moderators: **Carrie Barth and Emily Deaver**

PRESENTATION #40: **Cody Madison**

Victorian Noir

PRESENTATION #15: **Danielle Cloutier**

The Psychological Contract: Investigating Absenteeism

PRESENTATION #18: **Shyler Egan, Joseph Putz, and Anna Leloux**

Increasing mobility and balance: The beneficial effects of treadling in elderly women

PRESENTATION #29: **Ember Johnson**

Basic Rules of Combat: A Memoir

PRESENTATION #31: **Lisa Kittleson**

A Study of Workplace Civility

PRESENTATION #38: **Pa Musa Manneh**

Determinants of Divorce in the U.S

PRESENTATION #45: **Zachary Mitchem**

Take Off the Stigma

11:15 – 12:15 p.m.

POSTER SESSION I

East Hall

PRESENTATION #3: Scott Arneson, Donald Rudquist, Evan Koehler, Morgan O'Brien, and Wyatt Pouliot

Radiation Dose Characterization of 400 KeV Heavy Ion Beam

PRESENTATION #4: Mark Ash and Andrew Geislinger

Stripping Hemoglobin

PRESENTATION #7: Adam Barthel

Settlement & Sawmills: Analyzing the Establishment of Minnesota Towns in Relation to the Timber Industry

PRESENTATION #11: Jamie Cairncross, Austin Esser, and Eric Emery

Train Countdown

PRESENTATION #16: Alexandra Dewey

Perfectionism and Obligatory Exercise Among College Students

PRESENTATION #19: Robert Finstad

Performance and Security Evaluation of Embedded Networked Systems using WirelessHART

PRESENTATION #20: Tyler Flud and Kelsey Lee

The Effects of Marijuana on Academic Achievement and Life Satisfaction of College Students

PRESENTATION #30: Estelle Sonya Tachago Kamdom

The Effect of Wounding on the Expression of MicroRNAs in Peas

PRESENTATION #32: Joseph Klein

Government vs. Privacy: Full Disk, Mobile Message Encryption

PRESENTATION #37: Alec Leaf and Kyle Cleary

Millennials in the Workforce: A Modern Approach to Business Strategies

PRESENTATION #41: Alyssa Meyer, Rachel Dunkley and Victoria Schwarzingler

Development of a West Nile Entry Assay

PRESENTATION #43: Flint Million

Designing haptic feedback and auditory methods to access maps for the blind

PRESENTATION #44: Angela Miller, Samantha Lee, Grady Friedges, and Alex Russell

"He's just here to play a sport": A Qualitative Analysis of Perceived Gender Differences in Academia among Male College Athletes

PRESENTATION #49: Rachel HokLam Ou-Yong and Nathan Martin

Web-based software for predicting lung cancer treatment survival outcome

PRESENTATION #54: Nicholas Romach, Chien-Chien Chu and Pin-Tsen Chen

Individual and Organizational Importance of Work-life Balance Initiatives

PRESENTATION #55: **Krysta Sanders**

Identification and Characterization of Bacteriophage KleverKiS

PRESENTATION #58: **Mary Soderlund, Isabel Irazoque, Anguly Moua and Anne Roesler**

Development of a Biotin-like Cell Surface Marker for Isolation of Transfected Cells

PRESENTATION #59: **Holly Spitzer**

An Analysis of Bacterial Contamination of Chicken Eggs and Antimicrobial Resistance

PRESENTATION #60: **Samuel Spencer**

Personality Differences in Deception Detection

1:15 – 2:15 p.m.

POSTER SESSION II

East Hall

PRESENTATION #1: Alex Anderson, Daniel Bauman, Christian Bullert, Jared Gilbertson, Ryan Martenson, and Blake Mullen

Is Amazon the next Walmart? Ethical supply chain management and its online equivalent

PRESENTATION #6: Laura Barka, Daniel Haun, Nicholas Isackson, Jacob Jorgenson, Garrett Lieffring, and Megan Seidl

The VW predicament: Exploring the ethical impact of emissions and recalls in the auto industry

PRESENTATION #12: Joe Carlson, Khatija Choudhry, Jessica Craswell, Madeline Leonard, and Rebecca Rumpza

Uber unethical? The ethics behind Uber's decision to define drivers as partners rather than employees

PRESENTATION #14: Kyle Cleary

Millennials: Forcing Change in the Way You Do Business?

PRESENTATION #17: Katherine Dillon and Tera Lubinski

Jumping through hoops: The ethics of corporate tax avoidance

PRESENTATION #26: Mariah Gunderson and Nichole Moravec

A healthy misnomer: The ethics of organic labeling standards

PRESENTATION #27: Doren Hilmer

Is Facebook an Accurate News Source?: Where College Students are Getting Their News and How Much They Know about Current Events

PRESENTATION #28: Zach Hyatt, Emily Schaefer, and Randolph Givens

Effects of Training to Improve Posture and Balance in Corporate Adults

PRESENTATION #33: Alyssa Klenotich

Motivations for Physical Activity: Associations among Self-as-doer identity, exercise motivations and BMI in college students

PRESENTATION #34: Ashley Kloeckner, Taylor Kuhn, Jalana Larson, Emily Passint, Kaila Potting and Megan Williams

Effects of a Resistance Band Training Program on Muscle Soreness During Pregnancy with Limited Intervention

PRESENTATION #36: Alec Leaf

Mentoring the New Generation of Workers: A Look at What to Avoid When Millennials Enter Your Workforce

PRESENTATION #47: Morgan Murphy, Grace Smith and Abigail Strunz

Profiting in a non-profit: Exploring ethical compensation strategies in non-profit organizations

PRESENTATION #50: Kaylin Peterson

Regulation of breast cancer bone metastasis by tumor secreted BMPs

PRESENTATION #51: **Kendra Pohl**

Personality and Religiousness; Importance-for-Self vs. Importance-for-Others

PRESENTATION #56: **Zoe Schaefer and Kayla Van Amber**

Sex Worker Stigma: The Influence of Job Title on Victim Empathy

PRESENTATION #57: **Laura Schwickerath and Cassie Ross**

Cognitive Abilities & Language Skills in People with Aphasia

PRESENTATION #61: **Jena Teigen, Dillon Wagner, Joseph Kubera, and Cody Bolstad**

Sexy sells: Is it ethical to only hire attractive people?

PRESENTATION #62: **Emily Thorpe**

Palynology of Cretaceous sediments near Marmarth, ND: using pollen analysis to locate the stratigraphic location of the Cretaceous-Paleogene boundary

INDEX OF PRESENTATIONS

PRESENTATION #1

Alex Anderson, Daniel Bauman, Christian Bullert, Jared Gilbertson, Ryan Martenson, and Blake Mullen

Jana Craft, Faculty Mentor
Winona State University

Is Amazon the next Walmart? Ethical supply chain management and its online equivalent

Format: Poster

Walmart is often seen as a ‘corporate monster’. The modern way of shopping includes convenience, low prices, and variety, which has caused Walmart to gain a reputation for ruining small businesses. Walmart has already been exposed through many articles and studies about how they disrupt small businesses and towns, but has Amazon simply put a mask on their own online monstrosity? We plan on deriving research from journals, articles, and various studies on economic implications. As well as research based questionnaires distributed to Winona State University students. We expect to find how supply chain excellence allows a single corporation to maintain control over its suppliers and customers and, in turn, may have unethical consequences. Historical data showing how Walmart has already successfully implemented business practices that have proven detrimental for their own suppliers and is now fading due to Amazon, and their consumer support, is included.

PRESENTATION #2

Sarah Andrewson

Carolyn Whitson, Faculty Mentor
Metropolitan State University

What a Star Looks Like: The Male Gaze and Patriarchal Narratives in Dreamgirls and Sunset Boulevard

Format: Oral

This paper deconstructs similar scenes in two popular woman’s films, Dreamgirls and Sunset Boulevard, to reveal the underlying repressive messages being presented to women through the very movies meant to liberate them. It does this by applying the works of feminist scholar Laura Mulvey and film scholar Jeanine Basinger to the careful analysis of a scene in each movie where the films’ leading lady views herself on the silver screen. While the notion of watching one’s own film sounds empowering, peeling back the layers of these movie moments reveal Hollywood’s dark ulterior motives. Deconstructing the cinematic elements of these scenes expose how they actually reinforce Hollywood’s oppressive treatment of women as objects under the scrutiny of the male gaze, belittling even the most strong, successful women to mere devices of patriarchal narratives. When we stop to analyze these scenes in which powerful women view themselves, we realize they are loaded with elements of patriarchal oppression far exceeding those of female liberation. The analysis prompts questions regarding the fate of these passive female characters without the aid of the active male. These are important questions to ask ourselves as we consider the future of representation in

film, especially considering the alarming similarities we see between the two characters, despite their films being released 56 years apart.

PRESENTATION #3

Scott Arneson, Donald Rudquist, Evan Koehler, Morgan O'Brien, and Wyatt Pouliot

Andrew Roberts, Faculty Mentor
Minnesota State University, Mankato

Radiation Dose Characterization of 400 KeV Heavy Ion Beam

Format: Poster

We developed the characterization of the radiation dose rate produced by the 400KV Van de Graaff particle accelerator at the Applied Nuclear Science Lab at Minnesota State University, Mankato. The purpose was to establish operation parameters for providing known radiation doses for studies in materials science and biology. The radiation dose is surprisingly centered toward the low energy end of the accelerator, dominated by relatively low energy x-rays produced with the high current scattered beam. Beam generation and acceleration control were optimized to maximize the radiation dose available. Results show that the dose rate is proportional to the amount of beam current and strongly dependent on accelerating voltage. Also, we were able to reproducibly validate that the radiation dose rate is proportional to $1/R^2$ as the position of the dosimeter is moved away from the radiation hotspot. A maximum radiation dose of 5.5 rad/hr was observed at the broad hotspot, allowing for a radiation dosage of over 100 rad per day.

PRESENTATION #4

Mark Ash and Andrew Geislinger

Amy Runck, Faculty Mentor
Winona State University

Stripping Hemoglobin

Format: Poster

Hemoglobin is a protein in erythrocytes that is essential for gas exchange. This protein contains various cofactors including chloride and 2,3-DPG to name a few. Hemoglobin is a dynamic molecule in which any changes in the environment consequently show a marked change in oxygen binding affinity. Previous studies have shown that both of the above cofactors bind to hemoglobin to stabilize the molecule and thus influence its ability to bind to oxygen. The stabilization of hemoglobin by these two molecules has shown a decrease in oxygen binding affinity. This is physiologically significant for hemoglobin to be stable and have a lower affinity for oxygen in order to be able release oxygen when the environment changes. We investigated what happens to the oxygen dissociation curve when hemoglobin from a tiger salamander (*Ambystoma tigrinum*) is stripped of the above cofactors. We are interested in studying this in tiger salamanders as their hemoglobin is known to have a high affinity for oxygen (Gahlenbeck and Bartels, 1970; Runck et al unpublished data), and particular amino acids in salamander hemoglobin have been identified to bind readily to these cofactors (such as chloride and 2,3-DPG). Thus, this species presents an interesting system to study protein functioning through cofactor interactions. It was shown in our experiment that when the cofactors were removed, the oxygen dissociation curve shifted left, meaning hemoglobin showed a higher affinity for oxygen under these conditions.

PRESENTATION #5

Brandon Baer

Analia Dallasen, Faculty Mentor
Minnesota State University, Mankato

Methods for Characterization of Carbonaceous Meteorites

Format: Oral

Raman Spectroscopy, Scanning Electron Microscopy and Energy Dispersive X-ray Spectroscopy are three non-destructive methods for determining the chemical composition and structure, topography, and elemental composition of a sample, respectively. In particular, these techniques are excellent for studying meteorites in order to further understand the evolution of planet formation. In Dr. Dallasen's laboratory, we have a custom-built micro-Raman system that will be used to characterize carbonaceous meteorites. We have been optimizing the system using samples of known Raman signal such as silicon, diamond and C60, to be confident that we are receiving the best possible signal. We have also analyzed the power relationship between the laser output, and the power arriving at the sample. We expect to complete optimization, after which we will begin analyzing a new meteorite sample. We have conducted analysis of scanning electron microscopy and energy dispersive X-ray spectroscopy images, of meteorite samples, which gives us information about the topography and two-dimensional distribution of elements from the sample surface. We completed the analysis using software to stitch together multiple image files into a composite representation. The analysis found significant amounts of aluminum, iron, magnesium, and carbon. We correlate the obtained elements with the materials identified using Raman spectroscopy, such as olivine, pyroxene and graphite. The combination of these three techniques is a powerful set of tools for the analysis of carbonaceous meteorites. Going forward, these methods will lead to information on the composition of materials in the early solar system and could potentially answer questions regarding planetary formation.

PRESENTATION #6

Laura Barka, Daniel Haun, Nicholas Isackson, Jacob Jorgenson, Garrett Lieffring, and Megan Seidl

Jana Craft, Faculty Mentor
Winona State University

The VW predicament: Exploring the ethical impact of emissions and recalls in the auto industry

Format: Poster

Do tightening emission standards lead to unethical business practices in automotive recalls? Car manufacturers are facing the pressure of additional federal clean-air standards with tighter requirements for vehicle emissions. These regulations have allowed companies to develop specific competitive advantages when producing new vehicles, but at what cost? With a primary focus on Volkswagen, for example, we plan on gathering information from scholarly articles and from interviews with personnel automotive industry on the recall process and explore the ethical ramifications of emissions and recall procedures. We plan to interview some Volkswagen personnel, along with scholars to explore at which level in management unethical decision making occurred and how quickly the problem was resolved--whether intentional or not.

PRESENTATION #7

Adam Barthel

Gareth John, Faculty Mentor
St. Cloud State University

Settlement & Sawmills: Analyzing the Establishment of Minnesota Towns in Relation to the Timber Industry

Format: Poster

Since Minnesota gained its Statehood in 1858, nearly half of its 31 million acres of forests have been logged and were mostly plowed under for agriculture. In 1821, the United States government established the first lumber mill in what was to become Minnesota, in order to supply wood for the construction of Fort Snelling. It wasn't until 1839 that the first commercial lumber mill was opened in Marine on St. Croix by Orange Walker L.S. Judd, the town of Stillwater soon followed, then St. Anthony Falls, and by the 1880s the sawmilling industry had spread across the whole state including Brainerd, Little Falls, Crookston, Cloquet, Duluth and International Falls. The time between 1890 and 1910 were the peak lumbering years and by 1910, the golden era of lumbering in Minnesota had started to decline; the virgin pineries were being exhausted and lumber companies started to move south and to the Pacific Northwest to harvest timber. This research project will tell the story of Minnesota's settlement by analyzing the historical distributions of lumber mills throughout the state, from the first one in 1821 until the closure of the Virginia and Rainy Lake Lumber Company in 1929, which signaled the end of the big pine logging era in Minnesota.

PRESENTATION #8

Christopher Boone

Carla Norris-Raynbird, Faculty Mentor
Bemidji State University

What influences, outside of the classroom, determine a student's involvement in student organizations on-campus?

Format: Oral

This research attempts to measure two factors in dealing with student involvement. The first factor, the influences in life (non-academically focused) that contribute to either high, moderate or low student organization participation, on the student's behalf. The second factor, a measure of the level of current student involvement and to what degree as a collective- the amalgamated student body. In this, the presentation will cover the varying priorities of the student. This allows for the exploration of what is important to students and what is not; what components at the university level need more attention, and what components do not. The second factor will focus on what students view as important, so as to provide a sense of "what would work" in terms of student organizational programming and what appeals and attracts the most number of students.

PRESENTATION #9

Christopher Boone, Jordan Morgan, and Yunuke Nyanamba

Carla Norris-Raynbird, Faculty Mentor

Bemidji State University

Down the spine of the Mississippi: Our experience with coastal and community restoration

Format: Oral

With the ever changing, globalized, planet we occupy, we find that, increasingly, what occurs in one area of the world has a dramatic effect on another area of the world. In the case of this presentation, the same country. In this presentation we will attempt to explain the various connections between places so far in distance, and in culture, by way of a long, narrow body of water and how this brings the two places, Bemidji and New Orleans, together in ways many would not think to join the two. We will each approach varying issues in the presentation, from the cultural, traditional, historical, economic and political to the natural, medical and developmental traumas and attempt to hit on the same points so in that we display the connectedness of all these components as they relate to not only the cities but the importance to those who are residents of other areas of the Mississippi.

PRESENTATION #10

Annie Burkhart

Carolyn Whitson, Faculty Mentor
Metropolitan State University

She Made the Ultimate Sacrifice”: Examining the Obscured Identity of Betty Heslop in P.J. Hogan's Muriel's Wedding (1994)

Format: Oral

The main narrative thread of the 1994 film *Muriel's Wedding* presents stories of young women who regard weddings and marriage as the pinnacles of success for a woman. This paper explores how the story of often overlooked secondary character Betty Heslop, Muriel's mother, functions as a critical counterpoint to this pervasive ideal of the woman's life chiefly through the reduction of Betty's identity to nothing outside of 'wife.' The author focuses on the ways in which distinctive elements of *mise-en-scène* in two critical scenes of the film shape the viewer's conception of Betty Heslop as a woman in perpetual servitude to her husband and the effect this has on her sense of selfhood. In referencing conventions of the woman's film and employing feminist film critique, this analysis explores the film's dire ramifications of a married woman's attempt to recognize herself as an entity separate from her husband.

PRESENTATION #11

Jamie Cairncross, Austin Esser, and Eric Emery

Andrew Ferstl, Faculty Mentor
Winona State University

Train Countdown

Format: Poster

This is a design of a system that will inform automobile drivers how long it will take for a train to traverse a road crossing. It may also help alleviate some anxiety that motorists feel when they get “stuck” at a rail crossing. The project consists of these parts: powering the system, communication between micro controllers approximately 5 miles apart, signal acquisition and processing, and displaying the information on a usable format.

PRESENTATION #12

Joe Carlson, Khatija Choudhry, Jessica Craswell, Madeline Leonard, and Rebecca Rumpza

Jana Craft, Faculty Mentor
Winona State University

Uber unethical? The ethics behind Uber's decision to define drivers as partners rather than employees

Format: Poster

Uber has defined their drivers as partners (independent contractors) which limits the liability of Uber and the rights that the drivers are entitled to if they are employees. This case study uncovers the position taken by Uber in relation to its drivers and why it has decided to define their drivers as independent contractors (partners) while continuing to treat them largely as employees to develop a modern understanding of the issue. Data will be collected through questionnaires answered by Uber drivers, correspondence with Uber Corporate, and the interview of scholars knowledgeable within this area. What we hope to find is a clear reasoning behind why Uber has decided to define their drivers as independent contractors and not as employees.

PRESENTATION #13

Amadou Cisse

Ken Park, Faculty Mentor
Minnesota State University, Mankato

How Does The Minimum Wages Affect Teen's Unemployment, Time Series Analysis

Format: Oral

There have been a lot of arguments on the real effect of minimum wages on teenagers, non-educated and low-skilled workers. Even though minimum wages should be used as a factor increasing the economic well-beings of low-skilled workers, many of the recent studies showed that a substantial portion of low-skilled worker's jobs are negatively affected by the increase in minimum wage. In this sense, this paper attempt to identify the real effects of changes in minimum wages on low-skilled workers by looking into 50 U.S. states panel data. The empirical findings show that an increase in teenagers' unemployment is caused by a minimum wage hike.

PRESENTATION #14

Kyle Cleary

Jana Craft, Faculty Mentor
Winona State University

Millennials: Forcing Change in the Way You Do Business?

Format: Poster

The U.S. workforce is changing; Millennials (born 1983-2000), are coming into the workforce, while baby boomers (born 1946-1964) are leaving. Millennials will want a workplace environment that fits their unique needs. Research suggests that millennials crave collaborative work spaces rather than cubical farms. Kiwi Tech and Google are merely two examples of companies that have designed their workplace for open collaboration. Millennials also care deeply about what they do at work. Money is not as important as a satisfying work experience. Millennials tend to be motivated through healthy competition. Chris Wright, President of the Timberwolves, was interviewed for this paper because he designed his workspace specifically for Millennials. For modern businesses to be successful, they must throw out the old ideas and adapt to the new generation.

PRESENTATION #15

Danielle Cloutier

Jana Craft, Faculty Mentor
Winona State University

The Psychological Contract: Investigating Absenteeism

Format: Oral

Absenteeism takes a major toll on businesses causing them to lose employees for a period of time, which leads to increased costs and decreased productivity. Absenteeism is a silent killer that causes organizations to incur many indirect costs such as lower performance, training new employees, and overtime pay for those that pick up the slack. An unspoken psychological contract plays a large role in shaping the culture of the company, which is a major determinant in absenteeism. In addition, it is the link that connects an employee and employer together by establishing what is expected of the employee and what the employer will give in return, all be it unspoken. There are five main reasons for absenteeism: illness, mental health, family balance, entitlement, and job dissatisfaction. This paper will examine how three different organizations dealt with absenteeism differently and the reasons why. Based on the research and interviews conducted, I found that entitlement is not seen in many organizations, yet in the research, it is documented that it causes about 15% of absences. In addition, depending on whether a company is in the public or private sector, gives us insight into the level of absenteeism and the risk associated with being absent. All the other areas were consistent between the literature and interviews.

PRESENTATION #16

Alexandra Dewey

Trisha Karr, Faculty Mentor
Winona State University

Perfectionism and Obligatory Exercise Among College Students

Format: Poster

Personality traits and perception of body image often affect a person's will to lose weight. In today's society, awareness is great of the negative effects of eating disorders and over exercising to compensate for weight gain. Minimal research has examined these maladaptive behaviors in relation to personality traits and cultural standards for appearance. The purpose of this study was to identify how levels of perfectionism and environmental pressures for appearance are related to obligatory exercise. We hypothesized that high levels of perfectionism and environmental pressures would increase obligatory exercise. Participants (N=90) were women students from Winona State University, at least 18 years of age (M=19.2), and predominantly Caucasian (86.1%). Participants completed written versions of the Almost Perfect Scale (APS), the Obligatory Exercise Questionnaire (OEQ), and the Sociocultural Attitudes Toward Appearance-4 (SATAQ-4). A hierarchical multiple regression model confirmed significant prediction of obligatory exercise ($\Delta R^2 = 0.153$; $\Delta F(1,88) = 17.023$, $p < .001$). Block 1, total perfectionism score was positively associated with obligatory exercise ($t = 4.126$, $p < .05$; $B = 0.403$; $CI = 0.105-0.301$; $f^2 = 0.19$). For Blocks 2 and 3, weight and environmental pressures about appearance did not add additional variance to the model ($p > .05$). Weight and environmental pressures did not account for additional variance in obligatory exercise. Findings suggest a positive association between perfectionism and obligatory exercise cognitions and behaviors among college women. Greater awareness of the relationship between perfectionism and obligatory exercise is valuable for understanding the development of eating disorders.

PRESENTATION #17

Katherine Dillon and Tera Lubinski

Jana Craft, Faculty Mentor
Winona State University

Jumping through hoops: The ethics of corporate tax avoidance

Format: Poster

Some companies deliberately hire attractive people because they claim it increases their business' profits. This paper explores the ethical ramifications of looks-based hiring using direct interviews. Four companies were identified from different industries and representatives from each were interviewed. Preliminary findings from the restaurant industry show that employers skirt the law by labeling certain jobs as "entertainment." Ongoing research in retail, auto and other industries may uncover other practices.

PRESENTATION #18

Shyler Egan, Joseph Putz, and Anna Leloux

Mary Visser, Faculty Mentor
Minnesota State University, Mankato

Increasing mobility and balance: The beneficial effects of treadling in elderly women

Format: Oral

Research has demonstrated the benefits of regular physical activity, yet people tend to be less active as they age. Lack of regular activity may impact the aging process by increasing the risk of chronic disease and fall risk. Fitness professionals have striven to find activities that are simple, safe and beneficial for older adults. The two-footed treadle is a novel device that has been demonstrated to increase blood flow in lower

extremities, however it is unknown what other therapeutic benefits it may have. The purpose of this project was to determine how regular use of the device impacts measures of agility, walking speed, and balance in women 70-90 years of age. Four women were screened for disqualifying conditions. Baseline measures of the up-and-go test, foursquare step test, timed walk, 60 second treadle count, and the Activity-specific Balance Confidence Scale (ABC) were obtained. The women then trained for up to 30 minutes, twice a day, five days a week for six weeks. Student technicians supervised all training, and each woman trained with the same treadle. Results revealed improvement from pre- to post-training for most exercises and the women reported their mobility and balance had improved, although these effects were not significant. We concluded that further research with a larger sample is needed, but the treadle may be a viable exercise device for this age group. We would also like to test at least one other training pattern to determine if less frequent exercise would result in similar measurable outcomes.

PRESENTATION #19

Robert Finstad

Tirthankar Ghosh and Yi Zheng, Faculty Mentors
St. Cloud State University

Performance and Security Evaluation of Embedded Networked Systems using WirelessHART

Format: Poster

The project investigates how WirelessHART network protocol stacks are implemented, and what communication modes and protocols are being used to transfer data in the network. Additionally, research is being conducted to investigate the security of the WirelessHART protocol stack, and ways to design attack vectors to compromise the network. The project has been funded by a grant from Emerson Process Management. The project also includes interdisciplinary senior design projects with electrical engineering students including integrating WirelessHART components with custom embedded systems.

PRESENTATION #20

Tyler Flud and Kelsey Lee

Scott Peterson, Faculty Mentor
Southwest Minnesota State University

The Effects of Marijuana on Academic Achievement and Life Satisfaction of College Students

Format: Poster

We are studying college students to see whether they've used marijuana, and if they have, how often they've used it in the past six months. We are also examining their academic achievement using measures such as GPA, class attendance, class participation, etc., their academic motivation, and their overall life-satisfaction. The overall goal of our research is to see whether the use of marijuana affects academic achievement, achievement-related behaviors, academic motivation, and life-satisfaction. Our hypothesis is that use of marijuana will negatively impact academic achievement and life satisfaction in college students. Furthermore, heavy users and those who use in the academic setting will have less classroom participation, more instances of disciplinary actions, more involvement in cheating, and less attendance in classes. We

used a free, online survey tool (TypeForm) that does not ask for any personal information from the participants and is completely anonymous. Participants were recruited through various social media sites (i.e facebook, twitter) using a snowball sampling technique. There are 41 questions on the survey, including “yes/no”, short answer, opinion scale, and multiple choice. Marijuana use during the past 6 months was measured using a 6-point scale ranging from “never”, “once a month”, to “almost every day”; academic motivation was measured using the Wabash National Study of Liberal Arts Education Academic Motivation Scale; academic-related behavior was measured using questions about school punishment, class attendance, and cheating in class; and life satisfaction was measured using Pavot & Diener’s Satisfaction with Life scale.

PRESENTATION #21

Jennifer Gauerke and Alexandra Dewey

Trisha Karr, Faculty Mentor
Winona State University

Perfectionism and Weight-Related Behaviors Among College Students

Format: Oral

Previous research has connected perfectionism with efforts to change weight and shape, in line with the development of eating disorders. The purpose of this research was to examine perfectionism as it relates to unhealthy weight behaviors and obligatory exercise. Unhealthy weight behaviors included fasting/avoiding eating for the majority of the day, eating very little food, skipping meals, taking diet pills, making oneself vomit, using laxatives, and/or using diuretics. Obligatory exercise was characterized as a compulsive need to exercise. It was hypothesized that high levels of perfectionism would be related to weight-related behaviors. Perfectionism was categorized across three subscales; standards, discrepancy, and order, as well as a total perfectionism score. Female undergraduate participants (N=95) completed a demographic questionnaire, the Almost Perfect Scale-Revised, the Sociocultural Attitudes Towards Appearance-4, and the Obligatory Exercise Questionnaire. Participants were categorized as having unhealthy weight behaviors present (marking one or more) or absent. Independent sample t-tests and a hierarchical regression models were used to analyze these variables. Approximately half the participants reported engaging in unhealthy weight behaviors and a quarter of the participants noted clinical levels of obligatory exercise. Findings indicate greater levels of perfectionism are related to engagement in unhealthy weight behaviors and obligatory exercise. Greater awareness of the link between perfectionism and weight-related behaviors is valuable for understanding the development of eating disorders.

PRESENTATION #22

Stephanie Geier and Mu Mu Aye

Kerry Livingston, Faculty Mentor
Southwest Minnesota State University

Collecting and Analyzing Personal Narratives: A Summary of the Marshall Area Migrant Voices Project

Format: Oral

This presentation summarizes a research project that was conducted by a group of students at Southwest Minnesota State University during the fall semester of 2015. The Marshall Area Migrant Voices Project

explored the experiences of immigrants who moved to the Marshall, MN area within the last thirty years. Using snowball and availability sampling, students from an applied research methods course conducted 49 face-to-face, nonscheduled standardized interviews. Participants were asked about their experiences before and after migrating to the U.S. The digitally recorded interviews were transcribed, and through the process of data reduction, the most compelling parts of each story were used to create a narrative profile. In the final stage of the analysis, a small team of researchers used thematic coding to identify common themes that emerged from the interviews. A poster exhibit that included each narrative profile, as well as other important aspects of the project (i.e. literature review, sample information, and themes that emerged from the interview data), was highlighted at the Southwest Minnesota State University Undergraduate Research Conference.

PRESENTATION #23

Molley Glidden

Joyce Hwang, Faculty Mentor
Southwest Minnesota State University

Functional and Technical Ingredient application in the product development for RCA competition

Format: Oral

Technical and functional ingredients are used in food products as preservatives, flavor enhancers, texture modifiers, sweeteners, color additives, and fat replacers (Food and Drug Administration, 2004). In the product Southwest Street Tacos, xanthan gum and carrageenan gum are used in the Navajo Bread and Cilantro-Lime Greek Yogurt Sauce, respectively. Xanthan gum is used to provide elasticity in baked goods, dairy products, and dressings (Ingredion, 2015). The Navajo Bread is composed of part bread flour and part red lentil flour. Using red lentil flour causes a reduction in gluten formation in the bread, causing the bread to have less structure (Stockthon, 2010). Using xanthan gum, with its water-binding properties and temperature stability, provides the Navajo Bread with structure and pliability even with the reduced amount of gluten (Ingredion, 2015). Carrageenan gum is used in the Cilantro-Lime Greek Yogurt Sauce because of its gelling properties. Carrageenan is derived from seaweed and is useful for thickening food products and replacing fats. Carrageenan helps prevent syneresis of the yogurt sauce after it has been through several freeze/thaw cycles (Igoe, 2011).

PRESENTATION #24

Amber Godfrey and Darren A. Miller II

Heather Sklenicka, Faculty Mentor
Rochester Community and Technical College

Determining the Benefits of Alternative Haircare Conditioning Practices

Format: Oral

There has been a significant shift in health and beauty practices in favor of more all-natural solutions. Among these shifts is the use of alternative conditioners, such as raw food items. These foods include, but are not limited to, the use of bananas, avocados, and honey, in lieu of traditional, commercial conditioners. By observing physical changes at the microscopic level, measuring initial and final hair thickness, and

determining initial and final tensile strength, this research aims to validate anecdotal claims, which support the use of alternative conditioning agents.

PRESENTATION #25

Leandro Gomes Aguiar

Mahmoud Al-Odeh, Faculty Sponsor

Bemidji State University

Assembly line balancing using linear programming

Format: Oral

Improving the output of an assembly line is one of the goals that all factories try to achieve. Many problems and issues restrict factories from achieving this goal, including unbalanced assembly lines. Unbalanced workload among workstations and employees causes performance losses due to excess capacity and hiring more workers than necessary. In order to improve resource utilization assembly line balancing techniques have been used. Achieving balanced lines help organizations to boost productivity by reducing the cycle times, and providing a better environment for the workers, due to the balanced workload. Some companies try to balance their lines using only the expertise of experienced engineers. However, this approach usually leads to non-optimal solutions. The use of linear optimization algorithms, on the other hand, has proven to be a good technique for line balancing. Linear programming has been successfully used to minimize the cycle time or the number of stations/workers in many assembly lines. This research aims to show the process of implementing linear programming techniques to balance mixed-model assembly lines. The results of the implementation will be shared with the attendees.

PRESENTATION #26

Mariah Gunderson and Nichole Moravec

Jana Craft, Faculty Mentor

Winona State University

A healthy misnomer: The ethics of organic labeling standards

Format: Poster

The “made with organic” labeling makes consumers believe they are buying a healthier choice item and we want to discover if it is mostly organic or if there is more harmful ingredients than good. This paper will include information we will gather by conducting personal interviews with organic companies over the phone or in person. The companies that we will interview are companies that have recently been in the news and have been caught selling food labeled “made with organic” that ended up not being as organic as the companies have claimed. We also want to interview local companies that sell organic products. We expect to find companies that sell products that they claim to be “made with organic” but ultimately do not follow the regulations to be considered an organic product. Organic foods can be considered “made with organic” if it includes 70% or more organic ingredients. However, in the cosmetic industry, if a product has an organic label it is required to display the exact amount of organic ingredients included. We want to research and determine if the organic food industry should have the same standards as labeling food organic.

PRESENTATION #27

Doren Hilmer

Aurea Osgood, Faculty Mentor
Winona State University

Is Facebook an Accurate News Source?: Where College Students are Getting Their News and How Much They Know about Current Events

Format: Poster

There is a perception that college students are ill-informed about current events, and as a result ill-prepared for productive citizenship. This research project aims to better understand both where college students are getting their information and the accuracy of their knowledge of current events. This study collected data from approximately 413 students at a mid-sized, mid-western public university. Results suggest that social media is the primary source for current events among college students; approximately 88% reported using social media as a news source while only 4% reported using newspapers. When asked questions about knowledge of ten current events, students answered an average of 2.6 questions correct. The breakdown of questions averaged out to 27% correct on domestic events, 12% on international events, and 65% on pop culture events. This information is particularly important during a monumental election year. The implications of an ill-informed electorate are vast and include the undermining of democracy and the potential manipulation of ignorant voters. Results found that the majority of students polled get their news from Facebook, Twitter, CNN, and Fox news. The scores of the current event questions averaged out to 28.22% correct total, 27.72% correct on domestic, 12.88% correct on international, and 67.32% correct on pop culture.

PRESENTATION #28

Zach Hyatt, Emily Schaefer, and Randolph Givens

Jeffrey Bell and Kris Cleveland, Faculty Mentors
Southwest Minnesota State University

Effects of Training to Improve Posture and Balance in Corporate Adults

Format: Poster

Poor posture in a corporate office may affect work attendance and effectiveness. This study examined the effects of an 8 week, at-home, targeted exercise program on posture and balance. The study included 25 middle-aged corporate workers who were randomly divided into an exercise group (11 participants) or non-exercise control group (14 participants). ANOVA revealed no increase in posture (-2.56 ± 6.4 vs. -0.52 ± 5.8 , $p = 0.42$) determined by forward head deviation via the PostureScreen Mobile app, while participants in the exercise group compared to controls showed a significant increase in Y-balance performance measured on the right leg (7.0 ± 6.97 vs. -0.75 ± 5.47 , $p < 0.01$) or the left leg (6.4 ± 9.03 vs. -0.36 ± 7.28 , $p < 0.05$) after training. These results suggest that a posture exercise program may not be sufficient in itself to improve posture, however it indirectly improves balance.

PRESENTATION #29

Ember Johnson

Suzanne Nielsen, Faculty Mentor
Metropolitan State University

Basic Rules of Combat: A Memoir

Format: Oral

While structuring my memoir manuscript into five parts, each part headed by one of the army's five basic rules of combat, I discovered how those rules applied to writing it as well. I will present each rule and briefly discuss how it shaped my writing and my manuscript. If there is time, I will read the first chapter.

PRESENTATION #30

Estelle Sonya Tachago Kamdom

Theresa Salerno, Faculty Mentor
Minnesota State University, Mankato

The Effect of Wounding on the Expression of MicroRNAs in Peas

Format: Poster

Legumes and other crops are constantly challenged by abiotic and biotic stresses that decrease average yields by more than 50%. Previous studies have shown that microRNAs play crucial roles in plant defense mechanisms in response to stress. When wheat plants were wounded, decreased levels of miR-169 and miR-167 and increased levels of miR-319 were observed. In another wounding study with wild tobacco, both miR-167 and mi-RNA 319 levels were increased. This study investigated the effect of wounding on the expression of miR-167 and miR-319 in pea leaves. Little marvel pea seeds were planted in soil and placed in a growth chamber. After 14 days, leaves in one set of pots were wounded by a hemostat and leaves in a second set of pots were not treated. Leaves were harvested at 0,4,8,12, and 24 hours after mechanical wounding and immediately frozen in liquid nitrogen. Small RNAs were isolated using a modification of the mirVana Kit procedure. Absorbance values at 260 and 280 nm were used to assess acceptable quality and quantity of the purified small RNAs. DNA copies of the isolated RNA were made by reverse transcription using the Taqman MicroRNA RT Kit. qPCR methods were designed to amplify the cDNA and monitor the expression of miR-167 and mi-319. Efficiency curves showed that the qPCR designs were successful. The initial studies have shown that levels of expression of miR-319 and miR-167 were up-regulated at 4 and 8 hours but not 12 hours after wounding compared to the control pea leaf samples.

PRESENTATION #31

Lisa Kittleson

Kelly La Venture, Faculty Sponsor
Bemidji State University

A Study of Workplace Civility

Format: Oral

There have been increasing cases of incivility, bullying, social undermining, harassment, emotional abuse, and even workplace violence in higher education institutions. This can lead to increased workers compensation cases, increased utilization of employee assistance programs, absenteeism, deviant behavior, organizational dishonesty, turnover, reduced product quality, poor customer service, and loss of employee engagement. These are critical concerns for administrators of higher education institutions. Three university students were also concerned with the implications for the learning environment, and thus, became interested in exploring this topic. Using a semi-structured flexible interview script, three marketing research students conducted 30-60 minute interviews with 8 mid-level, senior-level, executives, and Cabinet members at one Midwestern university. Specifically, the purpose of the study was to explore how incivility impacts the workplace environment at one Midwestern university. Data indicate incivility had negative implications for the student learning environment, individual and departmental performance, and working relationships. Data also indicate study participants understand the implications of incivility in the workplaces, approach incivility issues seriously, and had ideas for improving on these issues. While a small sample was interviewed for this study, the findings are important. Also, by selecting exploratory research, the groundwork has been set for future studies of workplace incivility.

PRESENTATION #32

Joseph Klein

Faisal Kaleem, Faculty Mentor
Metropolitan State University

Government vs. Privacy: Full Disk, Mobile Message Encryption

Format: Poster

In 1995 U.S. Diplomatic Security Services and Pakistani Intelligence Services raided Ramzi Yousef's Islamabad guest house, arresting him and seizing a cache of weapons. Yousef, considered one of the main perpetrators of the 1993 World Trade Center Bombing and known Al Qaeda supporter, was arrested and extradited to the United States. Along with his arrest and the seizure of bomb-making materials, security services obtained Yousef's encrypted computer hard drive. FBI special agents spent more than one year decrypting Yousef's hard drive, which eventually revealed details to bomb 11 U.S. airliners. Decryption of the hard drive foiled the airliner bombings and aided in the life sentences he is currently serving at the Florence, Colorado super max prison. Though data encryption and cryptography has received big attention in recent years, it is a far from a new conversation. Throughout IT and Computing history, encryption and government have had a complicated relationship. Recent revelations of government surveillance and various high-profile data breaches have spurred private industry to increase encryption in more customer products. While increasing encryption has led to more secure data, it also brings new challenges to criminal investigation and thwarting terrorism. This research article details the complicated relationship between government and increasing encryption. This article investigates some of the most popular, and controversial, forms of encryption available to the public. It also seeks to leave the reader with the

understanding that the conversation around increasing use of encryption is more complicated than we may think.

PRESENTATION #33

Alyssa Klenotich

Amanda Brouwer, Faculty Mentor
Winona State University

Motivations for Physical Activity: Associations among Self-as-doer identity, exercise motivations and BMI in college students

Format: Poster

The self-as-doer is an identity linking self-concept and behavior and has been found to increase one's behavioral persistence for physical activity. Studies also show that active people have fitness motivations of enjoyment, social affiliation, and challenge, and that individuals with internal motivations (vs. external) are likely to have a BMI (body mass index) under 30. Yet little research has explored the associations between self-as-doer identity, BMI, and exercise motivations. Therefore, we examined relationships between self-as-doer identity, motivations to exercise and BMI. Participants (N=202; M=20.07; SD=3.047) completed a survey and a writing activity to assess their self-as-doer identity related to physical activity. Demographics, physical activity behaviors, height and weight were also recorded. Pearson's correlation coefficients were computed. BMI was positively associated with social recognition, health pressure, weight management, and appearance motivations. Self-as-doer identity was positively associated with exercise, nimbleness, stress, revitalization, enjoyment, strength and endurance, challenge, social recognition, affiliation, competition, and positive health and negatively associated with year in college. Results demonstrate that external goals with low motives towards self-growth are associated with higher BMI. Additionally, self-as-doer identity is related to goal-directed, positive, and promotional self-growth motivates. That the self-as-doer was associated with lower rank in college may suggest that freshman, compared to upperclassman, retain their physically active identities from high school. As students age they may develop competing identities, lessening their self-as-doer identity related to physical activity. Future research could explore the causal effects of self-as-doer and exercise motivations and determine what social influences affect motivations for those with higher BMIs.

PRESENTATION #34

Ashley Kloeckner, Taylor Kuhn, Jalana Larson, Emily Passint, Kaila Potting and Megan Williams

Erin White, Faculty Mentor
Winona State University

Effects of a Resistance Band Training Program on Muscle Soreness During Pregnancy with Limited Intervention

Format: Poster

PURPOSE: To determine the effects of resistance band training on muscle soreness when performed with limited intervention during the second and third trimesters of pregnancy.
METHODS: Pregnant women were recruited from a local hospital and took a pre-intervention survey.

Women were randomized to exercise (EX) or standard-care (SC) groups. The EX group performed a 15 week resistance band training program 3 times/wk. Participants then completed a post-delivery survey. Maternal, newborn, and delivery outcomes were measured. RESULTS: Twenty-five women participated, mean age at delivery was 26.5 years and mean prepregnancy BMI was 26.0 kg/m². There were no significant differences in maternal and newborn outcomes. There was a significant difference between groups for mode of delivery (vaginal vs. cesarean section) $\chi^2(2, n = 25) = 4.4, p = 0.05$. CONCLUSION: A low-intensity resistance band training program with limited intervention performed during pregnancy was associated a higher percentage of women in the EX group having vaginal deliveries. Adherence to the training program was high (>98%) and evidence showed no adverse results. However these findings need to be confirmed in a larger and more diverse sample. The use of resistance bands is a practical and cost-effective training program accommodating individual lifestyles. Thus, practitioners should consider encouraging women to participate in a similar prenatal resistance band training program to reduce lower body muscle soreness after delivery and increase the incidence of vaginal births.

PRESENTATION #35

Gabriella Lara

Marsha Driscoll, Faculty Mentor
Bemidji State University

The Imagined Day

Format: Oral

Many, if not all, aspiring educators dream, imagine, and plan their first day of teaching well before time calls to do so. Amidst the dreaming, fear of becoming a bad or ineffective teacher arise. Ineffective teachers can hinder a child's academic success. Knowing the characteristics of effective teachers can help assess an educator's likelihood of classroom success and improve professional development. This creative piece identifies and provides methods for one to improve and develop these attributes. Coming into the presentation, one will become a student and experience a rollercoaster of emotions and thoughts in an aspiring teacher's imagined first day.

PRESENTATION #36

Alec Leaf

Jana Craft, Faculty Mentor
Winona State University

Mentoring the New Generation of Workers: A Look at What To Avoid When Millennials Enter Your Workforce

Format: Poster

Many believe millennials to be arrogant kids that are too caught up in their cell phones and Facebook accounts to notice what is going on in the world around them. However, this is far from the case. This paper focuses on the ever-changing mentoring needs of millennial-aged workers: people born between 1980 and 2000. The newer, fast paced world has shunned the traditional one-on-one mentorship model of the past, creating a need for new and innovative styles of mentoring programs. Showing significant differences in

workplace desires and technology use, millennials are attracted to the workforce and mentored more effectively by getting rid of outdated, stringent guidelines. With this newer, more tech-savvy generation, more employers need to adapt their management strategy to suit changing workplace needs. Micro-feedback and reverse mentoring are two effective ways to mentor millennials. This paper will integrate public literature and interview findings, to explore mentorship approaches in the broadcasting industry. I found that millennials crave new forms of mentoring approaches that highlight their unique characteristics, and offer quick and consistent performance appraisal.

PRESENTATION #37

Alec Leaf and Kyle Cleary

Jana Craft, Faculty Mentor
Winona State University

Millennials in the Workforce: A Modern Approach to Business Strategies

Format: Poster

The workforce is changing; millennials (born 1983-2000) are replacing baby boomers (born 1946-1964) at an alarming rate. In order to have a productive workforce, managers must adapt and evolve motivation strategies to better satisfy millennial workers. Millennials are significantly different in their workplace needs and wants than previous generations. They are attracted to new and innovative work environments, which utilize the newest forms of technology. Research suggests that millennials crave collaborative work spaces rather than restricted cubicle farms. Timely, feedback in short bursts is also important even if there is some debate about whether or not it is necessary. Some researchers have found success using new types of mentor approaches: micro-feedback and reverse mentoring. Finally, Millennials tend to be motivated through healthy competition among co-workers. As a new generation of workers enters the workforce they carry with them new ideals and desires. This paper presents several strategies for creating a successful work environment for the upcoming generation.

PRESENTATION #38

Pa Musa Manneh

Ken Park, Faculty Mentor
Minnesota State University, Mankato

Determinants of Divorce in the U.S

Format: Oral

All around the United States, divorce has persistently been on the increase. It has become an inevitable epidemic in today's society, however the likelihood of divorce varies. In this paper, we will focus on 2014 as our base year of study and try to find the correlation between divorce and other variables such as income. The divorce rate in 2014 was estimated to be 6.3% per every 1000. With a total population of 256,483,624 there were 1,627,724 divorces reported in 2014 which is significantly high. This paper will work on using divorce as a dependable variable in conjunction with other independent variables such as income, education, age etc. to check the correlation these variables have with the divorce rate. Regression analysis will be made using ordinary least squares to make empirical analysis on the rapid increase in divorces. Divorces in the

U.S differ by regions, population, income, education etc. therefore we aim to have a vivid understanding of the continuous increasing divorces in the United States.

PRESENTATION #39

Tyler Massey and Randall Riehl

Timothy Brockman, Faculty Sponsor
Bemidji State University

Fossil fuel free ice fishing house

Format: Oral

Bemidji State University Sustainability Office, has a well-deserved reputation for minimizing the schools environmental impact on future generations. The goal was to provide a solar technology experience to Bemidji State University students by building a fossil fuel ice house. Design the inside of the house to best utilize the space for an ice fishing experience. Practice the sustainable concepts of Reduce, Re-Use, and recycle. Bring educational business resources together to make this project possible. I had over a hundred hours of my own time as the project manager for the construction of the inside of the ice house. I would like to demonstrate the use of all the resources, off campus and on campus in the Department of Technology, Art and Design that were utilized in the construction phase. We have partnered with several small businesses and other schools to make this vision become a reality in developing a fossil fuel ice fish house.

PRESENTATION #40

Cody Madison

Jessica Durgan, Faculty Sponsor
Bemidji State University

Victorian Noir

Format: Oral

When the word "detective" is brought up in literary circles, many critics would probably point to Sir Conan Doyle's Sherlock Holmes as the precedent for modern decisions concerning the mystery genre. However, before the inception of Scotland Yard's wunderkind, Mary Elizabeth Braddon's obscure novel Lady Audley's Secret introduced audiences to many of the tropes we see in detective fiction today. I will discuss Robert Audley, the protagonist of Lady Audley's Secret, in his role as a gentleman detective, analyzing how his character evolves from incompetent playboy into serious crime-solver. Lady Audley's role as an early predecessor to the femme fatale trope of detective fiction bears analysis as well and how her role as a dangerous woman influences the plot. I will also touch upon the subject of other detectives in the era that Braddon was influenced by or influenced with her representation of the gentleman detective.

PRESENTATION #41

Alyssa Meyer, Rachel Dunkley and Victoria Schwarzingler

Osvaldo Martinez, Faculty Mentor

Winona State University

Development of a West Nile Entry Assay

Format: Poster

West Nile virus (WNV) is a neurotropic, arthropod borne flavivirus that upon infection spreads systemically possibly via monocytes. VLPs are similar to the parental virus and can infect the same cells, however VLPs cannot replicate and are therefore safe to use. To better understand WNV pathogenesis, we are currently developing a WNV entry assay, which tests the virus's ability to infect specific cells. The WNV attachment envelope (E) glycoprotein determines the virus tropism and has been implicated in its neuroinvasiveness. Our VLP entry assay is based on the cytoplasmic delivery of beta-lactamase (BLA), an enzyme not normally expressed in mammalian cells, by infecting VLPs. If entry is successful, a fluorogenic substrate localized to the cytoplasm is cleaved by BLA and can be assayed using fluorescence microscopy or flow cytometry. To develop a WNV VLP that contains BLA, we have cloned BLA downstream and in frame to the E protein, creating a chimeric E-BLA protein. To test its functionality, WNV VLPs with or without the BLA will be tested for their ability to infect permissive BHK cells. Upon stimulation by an inflammatory response, monocytes, which may play a role in WNV pathogenesis, differentiate into macrophages, dendritic cells as well as upregulate IFITMs, which restrict virus entry. We hypothesize that WNV can infect monocytes and block the upregulation of IFITMs. This entry assay will be used to study whether WNV can infect human monocytes, macrophages and dendritic cells and if the infection is a requisite for IFITM deregulation.

PRESENTATION #42

Flint Million

Guarionex Salivia, Faculty Mentor
Minnesota State University, Mankato

Evaluating the Advantages of Braille Display Technology in Software Development

Format: Oral

People who are blind or have visual impairments face unique challenges as software developers. Screen reading technology is often unable to represent properly the complex and dynamic nature of modern application interfaces. To help alleviate this problem, a developer may choose to use electronic, refreshable Braille displays in addition to screen readers, which provide access to user interfaces in Braille. We explore the use of a combination of both speech and Braille interfaces as opposed to a screen reader only interface, to improve the performance and user experience of visually impaired individuals while performing common entry-level software development tasks. A single-subject longitudinal study shows gains in performance and improved user experience for the participant.

PRESENTATION #43

Flint Million

Guarionex Salivia, Faculty Mentor

Minnesota State University, Mankato

Designing haptic feedback and auditory methods to access maps for the blind

Format: Poster

Individuals who are blind or visually impaired face numerous challenges when it comes to accessing visual information. One type of information which presents significant challenges to blind or visually impaired people is geographic maps. GIS software solutions such as ArcGIS are commonly used to provide insight into data based on geographic features and/or political delineations. In this project we explore the use of haptic feedback as a method to assist blind individuals in accessing and interpreting map data. We designed a prototype application using an Android tablet which can present information on a map both via haptic feedback as well as via speech and sound effects. We plan to connect the application with ArcGIS so a blind individual could independently create and then access various maps and statistical analyses.

PRESENTATION #44

Angela Miller, Samantha Lee, Grady Friedges, and Alex Russell

Amanda. M. Brouwer and John C. Johanson (Faculty Advisors)

Winona State University

“He’s just here to play a sport”: A Qualitative Analysis of Perceived Gender Differences in Academia among Male College Athletes

Format: Poster

Gender differences exist in academic motivation and performance among athletes, yet little is known about why such differences exist. Therefore we conducted a study to explore athletes’ perspectives on gender differences in academia. A semi-structured interview was used to conduct 6 focus groups with 4 male athletic teams. Data were analyzed using Consensual Qualitative Research Methodology. Participants described how men have different priorities and are more likely to be distracted away from academic responsibilities. Regarding time management and organization, participants said, “females manage their time better and have it all planned out,” and “guys just kind of go with the flow”. Others noted that opportunities in athletics are different (e.g., men may be more likely to go professional earlier than women) and can be the source of academic performance differences. Cultural roles, defined as the societal expectations for men and women’s behaviors, were noted to include stereotypes associated with gender. For example, participants depicted that they “feel like [women] are held to a higher standard” and “sometimes people look at guy athletes and think, oh he’s just here to play a sport.” The drive, motivation, and effort between men and women in academics were also described as an important difference. Men concluded that gender differences in academia among athletes are because women tend to be more organized, less distracted, less likely to play professionally and live into cultural expectations to succeed academically. Future researchers could explore whether addressing these differences could lead to improved academic success for male athletes.

PRESENTATION #45

Zachary Mitchem

Kate Larson, Faculty Mentor

Bemidji State University

Take Off the Stigma

Format: Oral

Stigma is a form of negative labeling of people with mental illness and discrimination against them. Every day people from all around the world judge things that people do and say without the understanding the debilitating effects of mental illness. There are many misconceptions about mental illness and the aim of our video is to show that the one thing everyone has in common is being human, and everyone deserves to be treated as such. My group members and I, in order to bring awareness to the real discrimination that takes place everyday against those with mental illness, made a video to help raise awareness for those who suffer from mental illness.

PRESENTATION #46

Jordan Morgan

Anna Carlson, Faculty Mentor

Bemidji State University

Imagining A Tomorrow With a Fossil Fuel Free Endowment

Format: Oral

Divestment is a growing global movement started by a small group of undergraduate students at Hampshire College in 2011. These students asked their foundation to remove their investments in fossil fuel companies, and reinvest their money into socially responsible companies. Since their humble start, the Divestment movement has rapidly grown. Just five years later, there are currently over 500 institutions who have committed to divesting over \$3.4 trillion. Their message was clear: "fossil fuel investments are a risk for both the investor and the planet." Considering Bemidji State University's core fundamental value of Environmental Stewardship, should Bemidji State University join this swiftly growing movement and invest our endowment into fossil fuel free funds?

PRESENTATION #47

Morgan Murphy, Grace Smith and Abigail Strunz

Jana Craft, Faculty Mentor

Winona State University

Profiting in a non-profit: Exploring ethical compensation strategies in non-profit organizations

Format: Poster

In light of more recent concerns regarding financial transparency, such as the Wounded Warrior Project spending scandal, we will be investigating how executives and top employees of non-profit organizations are compensated. We will be answering the question: With regard to financial breakdown of a non-profit what is an ethical salary for an executive director in relation to the funds raised for the cause? Surveys will

be taken both from the perspective of non-profit (sample size of approximately ten non-profit organizations) organizations as well as from individuals (convenient sample size of 50-100 participants) who are donors to philanthropic organizations. This research will be of value to constituents in order that they may better understand how organizations make ethical decisions regarding compensations. Results from these finding will also help inform donors on how to select philanthropic organizations.

PRESENTATION #48

Phillip Oswald

Andrew Hafs, Faculty Mentor
Bemidji State University

Survival of walleye eggs in Upper Red Lake and the Tamarac River

Format: Oral

Data about walleye egg survival in the lake and river is lacking. Mesh cages were placed in both the Tamarac River and Upper Red Lake to compare survival rates. Twenty cages were set, ten in the river and ten in the lake. Each cage contained one hundred fertilized eggs which were checked every third day to measure survival. Temperature ($^{\circ}\text{C}$), dissolved oxygen (mg/L), and pH were measured at each location. The river had an average survival rate of 22% and the lake 8%. There was a significant difference in survival rates between the lake and river ($p = 0.007$), meaning that the river in the spring of 2015 was more suitable for walleye egg survival. Temperature did not differ significantly between the lake and river ($p = 0.12$) and therefore was not a likely cause of differences in egg survival. Dissolved oxygen significantly differed between the lake and river, ($p = 0.004$) however, it likely had little influence on survival because dissolved oxygen levels were in the optimal range for egg survival throughout the study in both systems. The lake had a lower survival rate than the river likely resulting from a higher average pH ($p < 0.001$).

PRESENTATION #49

Rachel HokLam Ou-Yong and Nathan Martin

Mingrui Zhang, Faculty Mentor
Winona State University

Web-based software for predicting lung cancer treatment survival outcome

Format: Poster

The research is to redesign the web-based software for predicting lung cancer treatment survival outcomes. The current application was designed eight years ago and is used at Mayo Clinic. It was done by integrating R statistical package into Java environment, introduced unnecessary complexity due to the need of the Cox Proportional Hazard model in R. To simplify the design, we developed Java version of Cox Proportional Hazard model to compute patient survival rate. Both ArrayList and HashMap of Java implementation are used for information exchange which includes processing patient's information in csv files. Our software tool calculates the survival rate according to the provided patient information and treatments selected, and then presents the survival curves on web-based interfaces. In the redesign of the software tool, we also target on improving the web design to allow a pleasant comparison of the patient's survival rate between different treatments.

PRESENTATION #50

Kaylin Peterson

Cynthia Forsman, Faculty Mentor
Minnesota State University, Mankato

Regulation of breast cancer bone metastasis by tumor secreted BMPs

Format: Poster

Breast, as well as other cancers, preferentially metastasize to the bone creating lesions that are often extremely painful and lead to fractures. Currently, there is limited treatment for bone metastases other than palliative. It is critical that we understand how breast cancer cells (BCCs) are able to promote colonization of and subsequent growth in the bone. This study will help identify therapeutically targetable interactions between the bone and BCCs. Osteoclasts are required for normal bone development, repair and maintenance. Their primary function is to degrade bone in response to homeostatic or repair cues. Tumor cells may secrete factors that enhance osteoclast activity and maturation. We are just now beginning to appreciate that BMPs play a role in osteoclast activity (Pham et al., 2011, Jensen et al., 2010) independent of osteoblasts which are well known targets of BMP. Our preliminary data show that bonetropic BCCs downregulate BMP2 and upregulate BMP4 and BMP7. This switch may be the basis by which BCCs influence osteoclast activity. To assess the ability of different BMP ligands to contribute to osteoclast differentiation, osteoclast precursors were isolated from C57/Bl6 mice, induced to differentiate with RANKL and treated with BMP2, BMP4, or BMP7. Cells were harvested and changes in osteoclast specific gene expression measured. The number of nuclei, size and activity were also measured. Our findings demonstrate that specific BMP ligands differentially affect both osteoclast differentiation and activity. Furthermore, those BMP ligands which are upregulated in many BCCs may play a significant role in osteoclastogenesis.

PRESENTATION #51

Kendra Pohl

Laura Koenig, Faculty Mentor
Winona State University

Personality and Religiousness; Importance-for-Self vs. Importance-for-Others

Format: Poster

Much research has been conducted on the above average effect that people rate themselves higher than people in general when asked about various qualities. The present study explored whether individuals would rate socially desirable traits (such as conscientiousness, agreeableness, and emotional stability) as more important to possess. 107 participants were asked to complete a survey in which they rated the importance of possessing different traits for people in general and themselves in particular. The trait items rated were from the five factor model, plus items related to spirituality and religiousness. It was believed that individuals would rate the traits as more important for themselves as compared to people in general. Paired samples t-tests were used to examine the mean differences, where differences were found for the five factor model but not for religiousness or spirituality. However, there were strong correlations between the

importance-for-others and importance-for-self ratings for all traits. Further analyses were completed on just the five personality traits using a 2(self vs. others) x 5(the big five traits) within subjects ANOVA in order to examine whether socially desirable traits were rated differently. Extraversion was rated as least important for self and others, thus our data suggests that it is less socially desirable. The bias for importance for self versus others was equal across all five traits and did not differ depending on how important the trait was on average. Order effects (i.e. whether the individuals rated themselves or others first) will also be examined.

PRESENTATION #52

Katherine Rasley

Mohammad Fanaei and Ron Ulseth, Faculty Mentors
Minnesota State University, Mankato

Hybrid Renewable Power Systems: Analysis of Feasibility and Design

Format: Oral

Historically subject to fluctuations of the iron ore market, an innovative solution is needed to facilitate sustainable economic growth for the communities in Northeastern Minnesota. The objective of this research is to analyze the feasibility of a hybrid renewable power system that utilizes the natural resources of Iron Range communities to produce clean energy with minimal environmental impact. The proposed renewable power system integrates a pumped-storage hydropower (PSH) facility used as a battery with renewable power resources. Surplus electric energy produced using green resources (i.e., wind and solar) is used to pump water from a lower- to a higher-elevation reservoir. A network of abandoned open-pit mines that are filled with fresh water exists in the region. These could provide storage for the proposed system, while minimizing the environmental impacts of large infrastructure projects. The stored energy in the PSH system will be harnessed by running water to the lower reservoir, turning a turbine to generate electricity during peak hours. The feasibility study used statistical analyses and climate data to determine the power production capabilities of solar and wind resources. These technologies have no greenhouse gas emissions, and the Iron Range has developed a skilled workforce in these fields. The broader social, economic, and political implications of implementing this project were investigated using market analysis tools. Mathematical modeling was performed to understand the potential storage of several pit lakes using GIS software. By combining renewable sources with PSH storage, a more environmentally-sound power producing grid was proposed.

PRESENTATION #53

Songha Reu

David Robinson and Robert Johnson, Faculty Mentors
St. Cloud State University

Academic Intervention and High School Completion for At-Risk Students: PSEO (Post Secondary Enrollment Options Program)

Format: Oral

PSEO (Post-Secondary Enrollment Options Program) has been designed for high school students to promote their rigorous academic goals through college courses offered in online or on-campus of SCSU as a way of “Dual-Enrollment Program” by the Minnesota Legislature. There are benefits to participants who enroll this program; their tuition is free and they can save time and learn transition skills to college. Also, the 9th to 10th grade students can pursue their academic opportunities with the form of “AP (Advanced Placement Course), IB (International Baccalaureate), and “Senior to Sophomore Program.” Especially, the Senior to Sophomore Program offers 9th to 10th grade students full college experiences through the courses taught by highly qualified high school teachers as a way of “Concurrent Enrollment Program.” The data that I collected showed that most of the participants consist of “White”, “Non-LEP”, and “Non-FRL” which are totally opposed to the participants of AOP (Access and Opportunity Program) meaning underrepresented students even though both programs proceed in the public schools. In my research, I will discuss the impact on high school graduation and persistence of PSEO participants based on data analysis.

PRESENTATION #54

Nicholas Romach, Chien-Chien Chu and Pin-Tsen Chen

Jennifer Schultz, Faculty Mentor
Metropolitan State University

Individual and Organizational Importance of Work-life Balance Initiatives

Format: Poster

Work-life balance is a concept that supports the efforts of employees to split their time and energy between work and the other important aspects of their lives. This research project looked at the importance of work-life balance initiatives for both employees and employers and presents low-cost high impact solutions for implementing work-life balance strategies in the workplace.

PRESENTATION #55

Krysta Sanders

Holly LaFerriere, Faculty Mentor
Bemidji State University

Identification and Characterization of Bacteriophage KleverKiS

Format: Poster

Bacteriophages are viruses that infect bacteria. In recent years, renewed interest in the use of bacteriophages as an alternative to antibiotic treatment has emerged with the growing prevalence of antibiotic resistant strains of bacteria. Phage therapy studies rely upon a large number of characterized bacteriophages. In the current study KleverKiS, a novel mycobacteriophage, was identified and analyzed. KleverKiS was isolated from a soil sample obtained from a 3 year old compost pile in Bemidji, Minnesota. Direct plating was used to isolate bacteriophages that infect *Mycobacterium smegmatis* from the soil sample. Four rounds of purification were performed to isolate a single type of bacteriophage. Purification rounds allowed for closer examination of plaque morphology revealing plaques ranging in size from 2 mm to 0.5 mm. The plaques were clear indicating the phage is lytic. Phage lysate was harvested from web pattern plates and the titer was calculated. The bacteriophage was analyzed via electron microscopy to determine the size and shape of

a single phage particle. DNA analysis using restriction enzymes was performed to determine whether or not the bacteriophage isolated was newly identified. The ability of the bacteriophage to infect a second species within the genus *Mycobacterium* was also examined.

PRESENTATION #56

Zoe Schaefer and Kayla Van Amber

Eric Sprinkle, Faculty Mentor

Minnesota State University, Mankato

Sex Worker Stigma: The Influence of Job Title on Victim Empathy

Format: Poster

The present study was designed to better understand the expressions of empathy toward sex workers as victims of sexual assault. Participants were randomly assigned a news article that described a sexual assault of a woman with a certain title (escort, sex worker, social worker, woman, dominatrix, prostitute or prostituted woman). After reading the article, participants were asked to complete the Victim Empathy Scale. The scale is divided into three composite categories: Victim Blame, Perpetrator Blame, and Empathy. Three independent samples t-tests were conducted to assess the differences between all sex worker conditions (escort, sex worker, professional dominatrix, prostitute, prostituted woman) and non-sex worker conditions (social worker, woman). All three composite categories of the Victim Empathy Scale did show a significant difference between sex worker and non-sex worker categories. This supports our hypothesis that those labeled as sex workers receive less empathy and more blame if victimized by sexual assault compared to non-sex workers. Further research could investigate the mechanisms behind this difference in empathy and blame.

PRESENTATION #57

Laura Schwickerath and Cassie Ross

H. Sheen Chiou, Faculty Mentor

Minnesota State University, Mankato

Cognitive Abilities & Language Skills in People with Aphasia

Format: Poster

This research study is a critical component to understanding the co-dependency and relationship of language and cognition. The purpose of this study was to investigate the relationships between cognitive abilities and language skills in people with aphasia. Data from the assessments of 14 individuals with varying types of aphasia, 10 with anomic, 2 with Broca's and 2 with conduction, were used for this research. Results were compared from the overall scores and subtest scores of the language based Western Aphasia Battery, (WAB), Communication Activities of Daily Living- Second Edition (CADL-2), American Speech-Language-Hearing Association Functional Assessment of Communication Skills (ASHA FACS), and cognitive based Cognitive Linguistic Quick Test subtests Design Generation (DG) and Symbol Trails (ST) to find if there were any relationships between language and cognition portions of the tests. The Auditory Verbal Comprehension subtest of the WAB and the overall CADL score showed significant correlation with the DG and ST. The ability to comprehend language and use language in daily activities in people with

aphasia is related to their cognitive abilities. On additional research finding was the score of the ASHAFACS has a significant correspondence with the ST score and did not show a meaningful correspondence with the DG score. This helped demonstrate the relationship of the performance of functional communication evaluated in the ASHAFACS with the measure of planning and mental flexibility evaluated in the ST. The DG test measures creative productive thinking that does not relate as well with the functional based aspects of ASHAFACS.

PRESENTATION #58

Mary Soderlund, Isabel Irazoque, Anguly Moua and Anne Roesler

Osvaldo Martinez, Faculty Mentor
Winona State University

Development of a Biotin-like Cell Surface Marker for Isolation of Transfected Cells

Format: Poster

This project establishes a protocol to separate successfully transfected cells from non-transfected cells using magnetic separation. A chimeric gene expressing a streptavidin-binding protein (sbp) and a shortened low affinity nerve growth factor (Ingfr) was constructed (sbp-mini). Magnetic Streptavidin Nanobeads can then bind to surface expressed chimeric sbp-mini. To express the sbp-mini gene, it was cloned into pDUO-mcs, which features two separate mammalian promoters allowing simultaneous expression of two genes, one of which would drive expression of sbp-mini and the other, which would allow expression of a separate gene of interest. To test for 1) surface expression of sbp-mini and 2) successful binding of streptavidin to surface expressed sbp-mini, streptavidin PE, which binds to biotin and fluoresces red, was added to PMHSM plasmid and green fluorescent protein (GFP) plasmid-transfected 293T cells. Using fluorescence microscopy, we show that PMHSM plasmid-transfected cells, but not GFP-transfected cells were decorated with streptavidin-PE and fluoresced red demonstrating that sbp-mini was functional. We finally tested whether transfected cells could be physically enriched from a mixed population of control and PMHSM expressing 293T cells. Magnetic Streptavidin Nanobeads were added to the mixed cell population and sorted using a magnet. Magnetically sorted and unsorted cells were then stained with streptavidin-PE and analyzed using a flow cytometer. The analysis showed successful enrichment of transfected (PMHSM) sbp expressing cells. In conclusion we show successful expression and function of a biotin-like marker. This protocol could be used in future experiments to isolate cells that transfect with low efficiency for further manipulation.

PRESENTATION #59

Holly Spitzer

Barbara May, Faculty Mentor
College of Saint Benedict and Saint John's University

An Analysis of Bacterial Contamination of Chicken Eggs and Antimicrobial Resistance

Format: Poster

In an effort to develop a better understanding of egg contamination during production, this experiment utilized a variety of types of chicken eggs, including those from commercial producers and local, private producers. These types included eggs with a variety of labels, such as organic, vegetarian fed, free range, farm fresh, and antibiotic free eggs. Bacterial samples were cultured and isolated from the shell, albumen (egg white), yolk, and outer shell membrane, and were identified using 16S DNA sequencing. In an effort to identify emerging bacterial resistance, the samples were tested for resistance (using the Kirby-Bauer method) to antibiotics and cleaners that are commonly used in egg production and are approved by the USDA for use on laying hens. It was hypothesized that differences in production (free range vs. caged, organic vs. non-organic, vegetarian fed vs. normal feed, etc.) may have some effect on the variety of bacterial contaminants and the areas of the egg they would be able to contaminate. Additionally, it was hypothesized that eggs that were more exposed to antimicrobials and antibiotics would exhibit more resistance. Finally, the experiment was expected to reveal trends in what types of bacteria are able to penetrate various membranes within the egg.

PRESENTATION #60

Samuel Spencer

Emily Stark, Faculty Mentor

Minnesota State University, Mankato

Personality Differences in Deception Detection

Format: Poster

Although a consensus has been reached that humans are no better than average in regards to deception detection, researchers continue to investigate individual differences in deception detection (Aamodt; Custer, 2006). The Big Five model is a widely used personality taxonomy often used to investigate personality differences in deception detection ability (John & Srivastava, 1999). Enos et al. (2006) concluded that there was a correlation between deception detection and openness to experience, agreeableness, and extraversion, respectively. This current study predicted that high levels of openness to experience, agreeableness, and extraversion will correlate with accuracy in a video clip deception detection task. There were 160 undergraduate students who participated in this study. Almost 90% of participants were in the 18-22 age range. The Big Five personality trait openness to experience had a significant correlation to overall accuracy on a video clip deception detection task. None of the other personality traits had significant correlations to accuracy. Although the results of this particular study were not entirely conclusive, the identification of personality differences in deception detection ability could be very useful for careers that rely on deception detection, such as corrections and law enforcement. Future research may want to consider different types of deception detection tasks, as well as different measures of personality. One limitation of this study is that it only focused on college students. It would be beneficial for future research to investigate personality differences in deception detection ability in different populations, especially those whose careers rely on veracity judgments.

PRESENTATION #61

Jena Teigen, Dillon Wagner, Joseph Kubera, and Cody Bolstad

Jana Craft, Faculty Mentor
Winona State University

Sexy sells: Is it ethical to only hire attractive people?

Format: Poster

Some companies deliberately hire attractive people because they claim it increases their business' profits. This paper explores the ethical ramifications of looks-based hiring using direct interviews. Four companies were identified from different industries and representatives from each were interviewed. Preliminary findings from the restaurant industry show that employers skirt the law by labeling certain jobs as "entertainment." Ongoing research in retail, auto and other industries may uncover other practices.

PRESENTATION #62

Emily Thorpe

William L. Beatty, Faculty Mentor
Winona State University

Palynology of Cretaceous sediments near Marmarth, ND: using pollen analysis to locate the stratigraphic location of the Cretaceous-Paleogene boundary

Format: Poster

The Hell Creek Formation is a group of laterally extensive sedimentary beds exposed throughout North Dakota and Montana. It is one of the best exposures of Late Cretaceous sediments in the world and is known for its iconic dinosaur fossil assemblages. To obtain more detailed information about the timing and impact of the Cretaceous - Paleogene (K-Pg) mass extinction it is important to precisely determine the stratigraphic location of the K-Pg boundary, which is found near the top of the Hell Creek Formation. Palynology can be used to determine this boundary by observing the relative abundances of fossilized pollen. Previous palynological analysis has described relative abundances of pollen samples throughout the region of exposed Hell Creek strata across the contact between the Hell Creek and overlying Fort Union Formations. A significant decrease in pollen abundance corresponds to the mass extinction event that marks the end of the Cretaceous period. Locally, the K-Pg boundary must first be identified using palynological analysis. The stratigraphy of the boundary can then be determined more precisely in this region. Sediment samples from the Hell Creek Formation near Marmarth, North Dakota were collected from the top of a butte estimated to be close to the stratigraphic K-Pg boundary. These samples were prepared for analysis at the University of Minnesota's LacCore pollen processing lab. Microscopic analysis to determine relative abundances of pollen species was performed at Winona State University. Knowing the stratigraphic location of the boundary near Marmarth will allow for more extensive studies of the K-Pg extinction and help to temporally locate excavations in the area. Better stratigraphic understanding of the boundary throughout the Hell Creek Formation will increase our understanding of the timing of the extinction and the environmental conditions before, during, and after the event.

PRESENTATION #63

Monica Villarreal

Jeffrey Buchanan, Faculty Mentor
Minnesota State University, Mankato

Therapeutic Benefits of Art Therapy with Older Adults with Dementia

Format: Oral

Art therapy is commonly used in adult day centers and long-term care facilities with older adults suffering from dementia. Art therapy as a therapeutic intervention for this population is still relatively new and art therapy can refer to many different methods and procedures, so it is unclear how effective these various interventions are. The purpose of this literature review was to evaluate the empirical literature examining the effectiveness of art therapy in this population. Inclusion criteria included studies where participants were diagnosed with dementia and studies using qualitative methods of analysis. Studies that were excluded studies that didn't involve older adults. In order to find relevant studies, academic search sites (i.e., ResearchGate, PsycInfo, Pubmed, and Ageline) were utilized and the following search terms were entered into each of these databases: art therapy; art therapy dementia; art therapy Alzheimer's disease. A total of 8 studies met inclusion criteria. The findings of this literature review show that individuals who are diagnosed with dementia and are exposed to art therapy show improvements in self-awareness, develop social skills, improve reality orientation, reduce anxiety, and increase self-esteem. These findings suggest that art therapy may improve behavioral symptoms and the quality of life in persons with dementia. Based on these findings, it is recommended that future studies more closely examine the administration of the art therapy by the facilitator. Overall, there is a need for further carefully designed clinical studies that evaluate art programs that are being utilized as a resource for persons with dementia.

PRESENTATION #64

Jeffrey Witthuhn

Andrew Anda, Faculty Mentor
St. Cloud State University

(0,1) Matrix-vector product via Minimum Spanning Trees

Format: Oral

We define, implement, and test our algorithm to more efficiently compute a $(0,1)$ matrix-vector product. A $(0,1)$ matrix is a rectangular matrix whose elements are either 1's or 0's. $(0,1)$ Matrices are used in many applications including information retrieval and graph algorithms. In computing a $(0,1)$ matrix-product, we can exploit the reduction of the inner-product to mere inclusion or exclusion of the vector's elements into a sum. Our method exploits our observation that we can compute an element of the resultant vector differentially by starting with a previously computed element from another row then adding or subtracting values corresponding to where the two rows differ in the $(0,1)$ matrix. We then build a complete graph where the vertices are the rows of the matrix and the edges are the hamming distance between the rows. We generate a minimum spanning tree of that complete graph and find its root. From the minimum spanning tree, we first compute a resultant vector element corresponding to the root of the tree, and from that initial element, we traverse the tree to compute the rest of the elements of the resultant vector. We show that our algorithm saves operations compared to conventional methods applied to matrices exhibiting certain properties, specifically those which are tall, having a dense population of 1's, and those having smaller dimensions.