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2016

## 2016 Program for Celebrating Scholarship & Creativity Day

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# Scholarship and Creativity Day

XXXXXXXXXX 2016 XXXXXXXXXXXX



COLLEGE OF  
Saint Benedict  Saint John's  
UNIVERSITY

*Ardolf Science Center 104, CSB*

### **Chemistry**

Joseph Freemark (Md Fazal, Chemistry) Exploring the Interactions of Polyethylene Glycol-Coated Magnetic Nanoparticles with Lysozyme.

The interactions of polyethylene glycol-coated (PEG) iron magnetic nanoparticles (MNP) and lysozyme from chicken egg whites were explored using various spectroscopic techniques. UV-Vis spectrophotometry indicated strong binding between Lysozyme and the iron MNP's. Fluorescence quenching experiments were used to determine the binding constants ( $K_a$ ), enthalpy changes ( $\Delta H^\theta$ ), entropy changes ( $\Delta S^\theta$ ), and free energy changes ( $\Delta G^\theta$ ). Results indicated that the iron MNP's quenched lysozymes fluorescence. The binding constants ( $K_a$ ) were determined as  $1.01 \pm 0.30 \times 10^7 M^{-1}$ ,  $0.95 \pm 0.30 \times 10^7 M^{-1}$ ,  $0.87 \pm 0.30 \times 10^7 M^{-1}$  at 298, 303, and 308 K, respectively. Changes in secondary structure of lysozyme induced by iron MNP's was also studied using circular dichroism spectroscopy. An assay for catalytic activity of myoglobin (peroxidase activity) will be used to determine how the MNP's effect the ability of the human proteins function correctly over time. These results will have a broader impact by showcasing how MNP's can play a large role in the degradation of human proteins.

*Clemen's Library Creativity Lab, CSB*

### **First Year Seminar (FYS)**

Darragh Cutter, Justin Blake (Mary Jane Berger, First Year Seminar (FYS))  
Benedictine Values

Our presentation is a movie that contains information about the benedictine values and how well they are known around campus.

Keegan Gallagher, Lance Kilde (Mary Jane Berger, First Year Seminar (FYS))  
Benedictine Values at CSB and SJU

Our presentation is a movie that contains information about the benedictine values and how well they are known around campus.

Kathryn Heimer, Taylor Rod (Mary Jane Berger, First Year Seminar (FYS))  
Benedictine Values in Action

Our presentation is a movie that contains information about the benedictine values and how well they are known around campus.

Abigail Hillyer, Sydney Robinson (Mary Jane Berger, First Year Seminar (FYS))  
How well do we know the Benedictine Values?

Our presentation is a movie that contains information about the benedictine values and how well they are known around campus.

Leah Koll, Mackenzie Butenhoff (Mary Jane Berger, First Year Seminar (FYS))  
The Values and Us

Our presentation is a movie that contains information about the benedictine values and how well they are known around campus.

Jacob Santiago, Benjamin Hergott (Mary Jane Berger, First Year Seminar (FYS))  
A Benedictine Experience

A video looking at the Benedictine Values and how they are portrayed on both campuses.

Ya Thao, Ashley Vang (Mary Jane Berger, First Year Seminar (FYS)) Values  
Brought to Life

Our presentation is a movie that contains information about the benedictine values and how well they are known around campus.

Ricardo Vences, Maritza Delgado (Mary Jane Berger, First Year Seminar (FYS))  
St. Benedict Affecting Everyday Lives

Our presentation is a movie that contains information about the benedictine values and how well they are known around campus.

Luke Wallace, Riley Drew (Mary Jane Berger, First Year Seminar (FYS))  
Benedictine Values in Action

Our presentation is a movie that contains information about the benedictine values and how well they are known around campus.

*Henrita Academic Building 009, CSB*

### **Education**

Megan Vit (Bret Benesh, Education) The Traveling Salesman and Euler Circuits

My project is based on a "traveling salesman" technique. I will show how I have attempted to use an Euler Circuit to demonstrate how one person can travel to all twelve Apostle Islands in one trip, without having to backtrack or repeat an area. This method that I am using is based on graph theory.

## **Mathematics**

Benjamin Alvord (Bret Benesh, Mathematics) Heron's Formula

I'll be looking into Heron's Formula and then presenting what I've learned at creativity day.

Kristin Blom (Bret Benesh, Mathematics) Exploring Etch-a-Sketch Conic Sections

This project considers conic sections including parabolas, ellipses, and hyperbolas through a unique geometric perspective called Etch-a-Sketch. By exploring the shapes and types of their graphs, distinct features of these three Etch-a-Sketch conic sections will be made apparent.

Shannon Callanan (Bret Benesh, Mathematics) The Route to Landmarks around Minnesota

I will be doing a project on the Travelling Salesman Problem. I have chosen ten different locations throughout Minnesota that I believe everyone should visit when coming to Minnesota. I will be using the greedy algorithm to find a "good" solution for traveling to all ten of these locations.

Zoe Cave (Bret Benesh, Mathematics) Etch-a-Sketch Unit Circle

This project takes a look at a trigonometry unit circle in Etch-a-Sketch geometry. I will find points to determine if there is a nice way to find sine, cosine, and tangent in Etch-a-Sketch mathematics, like there is in Euclidean mathematics.

Benjamin Etzell (Bret Benesh, Mathematics) Travelling Salesman MLB

I will be finding the shortest distance in which one can travel to every MLB ballpark west of Kansas City.

Maddisen E. Farver (Bret Benesh, Mathematics) Heron's Formula

I am going to prove Heron's Formula

Bailey A. Fowler (Bret Benesh, Mathematics) Heron's Formula for Triangles

On my poster, I will prove that Heron's Formula for triangles is always true. The formula will be identified, defined, and proven.

Alexis Gent (Bret Benesh, Mathematics) Explain why every Euclidean isometry can be considered a composition of at most three reflections.

For my project, I will be explaining why every Euclidean isometry can be considered a composition of at most three reflections. I will be discussing the three reflections as translations, reflections and rotations. A Euclidean isometry is any way of transforming the plane (shape) without “deforming it” or changing the size and shape. In my project I will be discussing why a Euclidean isometry can be described as one of these three reflections.

Brianna M. Hartke (Bret Benesh, Mathematics) Heron's Triangle

I will be explaining Heron's Triangle and proving why it works.

Elizabeth Y. Jakubic (Bret Benesh, Mathematics) Heron's Formula

I will be explaining why Heron's Formula for triangles is true.

Catlin N. Morral (Bret Benesh, Mathematics) Exploring the Traveling Salesman Problem

My project will determine the most efficient route to pre-travel through different cities in Europe. I will be demonstrating this through attempting to use an Euler Path, which is a component of graph theory.

Jamie Muske (Bret Benesh, Mathematics) Traveling Salesman Problem

I will be creating a project based on a salesman traveling to different cities and I will find the shortest way possible to travel to all of the cities.

Ellen Reidt (Bret Benesh, Mathematics) School to School WISCONSIN

How to get from each UW school the fastest and easiest.

Brittany J. Roelike (Bret Benesh, Mathematics) Traveling Salesman

My project consists of a mathematical algorithm for answering a Traveling Salesman Problem. This algorithm will answer a real-life set of ten Minnesota National Parks, and the shortest route to road trip to all ten of them.

Natalie N. Uecker (Bret Benesh, Mathematics) Fastest way to tour Minnesota colleges

I am measuring the quickest route to travel to five University schools in Minnesota.

Hannah M. Zobitz (Bret Benesh, Mathematics) Etch-a-Sketch Angles

I am researching angles within Etch-a-Sketch geometry.

*Henrita Academic Building 101, CSB*

### **Languages & Cultures**

Benjamin Baumann, Erin Baumer, Megan Lundquist, Conor Murphy (Jason Schlude, Languages & Cultures) Archaeological Field School: Omrit Settlement Excavation Project, Israel

This panel is part of a “Classics” session devoted to Greco-Roman antiquity. In it four student excavators will discuss the research of our archaeological field school in Israel, which is focused on the excavation of a Roman-period settlement associated with a major Greco-Roman temple complex. The presentations will cover the history of the temple complex and settlement, our excavation techniques and the types of evidence recovered, the sources of building materials and the building techniques used, and the significance of visiting neighboring archaeological sites to better contextualize, envision, and ultimately understand Omrit. The student presenters will include Benjamin Baumann, Erin Baumer, Megan Lundquist, and Conor Murphy, all of whom excavated at Omrit in June 2015. Come check out our “digs”!

"The Cultural Evolution of Omrit" by Benjamin Baumann

My presentation will be about the various cultures that settled at Omrit over time and their contributions or changes to the site. As a result of the eclectic cultural influence, the site of Omrit is a standing representation of world heritage. The evidence I will use to prove this will come from archaeological evidence and the material culture at Omrit.

“Oh, the Pottery You'll Find” by Erin Baumer

Evidence comes in all shapes and sizes, but how we use it is just as important as what we find. This presentation will cover our excavation techniques, the types of evidence we find, and what we can learn from it.

“The Use of Buildings and Structures Over Time” by Megan Lundquist

While working at the Omrit Archeological Field School in Israel, we were able to identify a colonnade and associated building. Using evidence gathered from previous excursions, our findings from the Summer 2015 season, and previous research done on the site, we have identified important details that could indicate how the buildings and structures were built and how they were used. As we investigated the construction of the structures, we could identify details and practices used by the people who built this settlement thousands of years ago. Their use of materials, where those materials originated, and how the materials were re-used for different purposes over time help us identify how the structures evolved with the people living in and around them.

“Digging Omrit and Exploring Other Sites” by Conor Murphy

Digging at Omrit was a difficult process. I will present on how a square is dug from start to finish and how my particular square was unique from others on site. I will then talk about what an average day was like while digging at Omrit. Photos from my square will be an essential resource for this portion of my presentation. Concluding my presentation, I will show a video I made from the trips that we took to different archaeology sites while in Israel. Before showing the video, I will explain how the purpose of the site visits was meant to be a source for seeing the layout of ancient cities so that we could potentially apply those layout trends to our own site at Omrit and get a better feel for where we were digging.

*Henrita Academic Building 102B, CSB*

### **Asian Studies**

Mai Chaw Lee (Zhihui Geng, Asian Studies) Rise of Feminism in the Hmong Community

After the Vietnam War, there was a mass migration of the Hmong population from Thailand and Laos to the United States. The first mass of Hmong people, grandparents and parents encountered many changes; the American lifestyle, modern time and feminism. The American lifestyle disrupted the old, traditional lifestyle that Hmong people were used to. Today, many first and second generation Hmong youths are often finding themselves conflicted with the intersectionality of embracing the American and or Hmong identity. The typical roles of Hmong daughters and sons are changing from 40 years ago and will continue to change. Hmong elders are more willing to learn and adapt to these changes as the rate of education, gender equality and success in the Hmong community continues to grow.



Paul Park (Zhihui Geng, Asian Studies) Korean Evangelicals on North & South Korean Relations

This project seeks to provide a better understanding of the factors that shape North and South Korean relations. This remains an important issue because many South Korean's still have the lingering feelings of the North and South separation as an unresolved issue. For many Koreans, the war is still on-going and the nation is still divided. However, little research has been done on the influence of evangelicals on foreign policies towards unification. Therefore, in order to further understand the impact of South Korean Evangelicals as an interest group, it is important to review the history of Evangelicals in Korea and its influence on South Korean national politics. This project seeks to answer the following: how are evangelical groups shaping South Korea's relationship with North Korea? Through unstructured interviews with Evangelical leaders, I was able to determine the majority of the Evangelical communities thoughts and ideas on the North & South Korean relationship as well as the impact that Evangelicals can have.

*Art Building Gallery, SJU*

**Art**

Jessica Lindemyer, Va Lor, Andrew Macaitis, Ryan Miller, Andrew Poster, Mary Xiong, Ong Xiong, Kristopher Yanisch (Simon-Hoa Phan, Art) Senior Thesis Show

The stimulating and diverse Thesis Show by art majors includes works in computer art, drawing, sculpture, video, book art, animation, and installation. The artists will address their approaches in the subject matter, medium, technique, and thematic content.

*Great Hall , SJU*

**English**

Aimee E. Hanson (Christina Tourino, English) How to Survive a Literary Classic

This project examines the characterization of dying and surviving characters in the novels read in the Passion, Tragedy, and Sacrifice class, specifically in terms of gender, character traits, age, and social status through a statistical analysis of character demographics and personalities. The analysis attempts to answer the questions of who the Western literary tradition maintains as deserving to die and which types of characters have the greatest chance of survival.

**Experiential Learning & Community Engagement**

Christina Ayodele (Laura Hammond, Experiential Learning & Community Engagement) Minnesota Public Radio: Gary Eichten Fellowship

For Scholarship and Creativity Day I will be presenting on my experience working for Minnesota Public Radio. During my internship I had the opportunity to work directly with reporters, producers and more. Additionally, I was able to experience different aspects of what makes the MPR newsroom such an innovative and successful environment. Working for MPR was an amazing opportunity to improve my journalism and reporting skills through working in the field with reporters on various assignments to developing my own story with the help of nearly everyone at MPR.

William R. Canfield, Hannah M. Nelson, Yan (Vincent) C. Lai, Kaci D. McCoy (Lisa Lindgren, Jennifer Schaefer, Experiential Learning & Community Engagement) Mayo Innovation Scholars Program: Commercializing Innovation

The Mayo Innovation Scholars Program provides undergraduate students with the opportunity to research projects submitted by Mayo Clinic professionals, from a variety of disciplines. Under the guidance of an MBA graduate student and Mayo Clinic Ventures, our interdisciplinary undergraduate team integrated students majoring in Biochemistry, Global Business Leadership, Biology, and Communications. Our team was a microcosmic example of the intersection of business and scientific innovation. This experience revealed, time and time again, the importance of building a cohesive unit that effectively plans project objectives and milestones. We relied on each other to navigate a complex project and develop a plan of attack. At the end of the day, the countless hours that we spent on this project were not for personal benefit - rather for the betterment of our team. We held each other to a higher standard, with the goal of delivering a final product that was as thorough and impressive as the discovery itself. The assigned project required our interdisciplinary team to develop a commercialization strategy for a discovery made in one of the research labs at the Mayo Clinic. Our team conducted extensive research relating to intellectual property, patent law, and pharmaceutical drug development. In essence, our team functioned with the same objective of Mayo Clinic Ventures. We were responsible for determining the potential options for commercializing the Mayo Clinic's intellectual property.

Theresa Farrell, Meg Schrafft, Jackie Liska, Katie Cleary, Melissa Goranowski, Rylee Pool, Dona Marthaler, Cullen McAnally (Adia Zeman, Experiential Learning & Community Engagement) Bonner Leader Senior Capstone

The eight senior members of the Bonner Leader Program will present on the experiences they've had with Bonner throughout the past four years. They will reflect on how their experiences align with the overall mission of the program and how Bonner has "[transformed] the lives of students and members, the life of their campuses, their local communities, and the world through service and leadership" (from the Bonner Foundation mission statement). Each will share their individual experiences working with community organizations, the service opportunities and projects their cohort has worked on (including their senior capstone project), and the ways in which Bonner will shape their lives after graduation.

Niesha Ford, Daley Rugar, Lauren Wise, Sam L. Harper (Laura Hammond, Experiential Learning & Community Engagement) Mayo Innovation Scholars Program

The Mayo Innovation Scholars project provided market research and made recommendations for market viability of a division within the Mayo Clinic.

James T. Pathoulas (Jennifer Kramer, Laura Hammond, Experiential Learning & Community Engagement) Lindmark Fellowship: Ethical Documentation At The End Of Life

Healthcare providers in Minnesota can use a variety of documentation methods to record patients' care preferences at the end of life. Traditional end of life documents often require legal counsel, which is a barrier to their widespread use. This project examines the current state of end of life documentation and efforts to implement new records that meet an evolving patient population.

Sabrina Schultz (Adia Zeman, Experiential Learning & Community Engagement) Summer Research on Cybercrime Developed into All College Thesis

The presenter will share a poster on the affects of cybercrime on 25 different business that was informed by research in collaboration with Sanford Moskowitz, chair of the CSB/SJU Global Business Department. The presentation will also include the presenter's further collaboration with Professor Moskowitz developing this research into a honors thesis which will be a comparative analysis of how cyber crime affects the European Union, The US, and India.

### **Jay Phillips Center for Interfaith Learning**

Kathryn Cleary, Chamani Gunasekera (Adia Zeman, Jay Phillips Center for Interfaith Learning) Sustainability and Faith

The mission of Interfaith Power & Light is to be faithful stewards of Creation by responding to global warming through the promotion of energy conservation, energy efficiency, and renewable energy. This campaign intends to protect the earth's ecosystems, safeguard the health of all Creation, and ensure sufficient, sustainable energy for all. In St. Cloud, mayor Dave Kleis has decided to bring solar energy to St. Cloud to replace the closing coal plant. This project will highlight the benefits of solar energy, who is affected by this switch and the work that still needs to be done to make St. Cloud more sustainable.

## **Mathematics**

Claire R. Boatman, Bryan J. Crossman, Lydia M. DeMorett, Douglas R. Doboszinski, Grayden Ewing, Thomas J. Fulton, Zachary J. Gibbs, Maxwell P. Hankner, Sydney L. Hughes, Nicolas E. Juhl, Kevin M. Lamb, Kathryn S. Larson, Jack R. Magnuson, Connor P. O'Rourke, Jordan L. Paulson, Kirsten M. Sewall, Justina J. Sorensen, Jacob S. Upton, Forest J. Ward, Luke J. Wilkowski, Colin L. Zimprich, Nicholas Daoust (Jennifer Galovich, Mathematics)  
Applications in Linear Algebra

Students from Math 239 will present a variety of applications of linear algebra.

Megan Weiss (Sunil Chetty, Mathematics) Philosophy of Mathematics

We have been studying the philosophy of mathematics, with particular attention to finding interesting mathematical problems which can help distinguish (some of) the central qualities of each philosophy. In addition, we have engaged in a study of formal languages and first-order logic. Lastly, we have paid attention to the history of some of the prominent philosophical schools of thought.

Kang Yan, Forest J. Ward, Jordan L. Paulson (Bret Benesh, Mathematics)  
Problems related to Fibonacci sequence

Our project mainly focus on the relationship between the different terms in the Fibonacci sequence. In our project, we discussed some different variation of Fibonacci sequence by changing the first, second term and the formula of the  $n$  th term.

## **Philosophy**

Alex Ingulsrud (Emily Esch, Philosophy) Agricultural Policy Reform: An Argument for a Soil Erosion Tax

This presentation explores the history of US agricultural policy with a focus on soil erosion and conservation policy since the great depression

and dust bowl years, drawing historical lessons to make the argument for a soil erosion tax.

## **Psychology**

Emily A. Berg, Justin P. Jacques, Kayla M. Stark (Robert Kachelski, Psychology) Gender Differences in Facial Change Detection

Previous research has shown that women are significantly better than men at recognizing subtle emotional expressions in faces. The purpose of our experiment was to determine if women are able to detect general facial changes better than men, and also to see if facial changes are detected better in opposite-sex faces than same-sex faces. In order to test this, we had participants complete a change-detection task using photos of people's faces. On half of the trials, a sequence of images was shown in which the original photo alternated with a modified version of the photo in which a relatively subtle change was made to the person's features. On the other half of the trials, a sequence of images was shown containing only the original photo being shown repeatedly. The participants indicated for each trial whether or not they detected a change. Half of the trials in each condition (change or no change) used women's faces in the photos and half used men's faces. We recorded the percentage of correct answers overall for each participant, as well as the percentage correct in each condition. This allowed us to test whether women were better at detecting facial changes overall, and also whether participants detected changes better in opposite-sex faces than in same-sex faces.

Collin T. Ernste, Grace L. Cardinal, Jacob J. Wankel (Robert Kachelski, Psychology) The Effects of Item Difficulty and Question Order on Confidence Level When Taking Multiple-Choice Tests

The purpose of our research was to discover the best way to format a multiple-choice test in order to provide the maximum amount of confidence for the test taker while also accurately testing his or her abilities. Participants completed a 45-question, multiple-choice general knowledge test. The participants were randomly assigned to one of three groups, which differed only in terms of the order of the questions on the test. For one group, the test began with easy questions and the question difficulty increased as the test progressed. For a second group, the test began with difficult questions and the question difficulty decreased as the test progressed. For a third group, the questions were randomly ordered, so that the question difficulty varied randomly throughout the test. The number of response options also varied throughout the test questions. We predicted that participants' confidence levels would be affected by the order of the questions, such that confidence would be consistently lower in the group with difficult questions at the beginning

of the test, and that this could translate into lower scores on the test for this group compared to the other groups.

Angelica Fajardo, Yuxuan Wang, Pang Z. Sandy Lee (Robert Kachelski, Psychology) To Confess or Not Confess? That Is the Question

Previous research shows that many factors influence how long people think criminals should be sentenced to prison when convicted of various crimes. The purpose of our research was to determine if the timing of a confession influences sentencing decisions. The participants first read a passage that described a case of a man convicted of robbing a bank. They were then asked to make a decision on how long the prison sentence should be for this individual. However, the case description was varied slightly across groups of participants to manipulate whether or not the individual confessed to the crime, and if so, when that confession was made. Participants were randomly assigned to three groups. The first group read a case description in which the individual confessed to the robbery immediately. The second group read a case description in which the individual denied the robbery at first, then confessed to it later. The third group read a case description in which the individual denied the robbery all the way through and never confessed. Based on previous research, we predicted that participants given the case description with an immediate confession would choose shorter prison sentences than participants in the other groups.

Natalie Frier, Zach Bigaouette, Cindy Firman, Colin Fisher (Eamonn Arble, Psychology) Sex Differences in Group Conformity

The purpose of our experiment was to determine if male participants are more likely to conform to group opinions based upon the gender composition of the group. To test this, participants (all men) were randomly assigned to one of three groups: a male confederate group, a female confederate group, or a mixed gender confederate group. Each group was asked a standardized set of ten questions with a mix of positive- and negative-worded factual queries that test common knowledge, as well as questions regarding subjective opinion. After each question, the confederates responded with a pre-determined response. The participant, responding last, was allowed to respond freely. The frequency of participant conformity to group opinion was recorded.

Jacob Hauger, Sophie Samson, Luke Olley, Ethan Ferry (Linda Tennison, Psychology) Effect of emotional stimuli on the Rubber Hand Illusion

The Rubber Hand Illusion (RHI) is an experiment that can be used to quantify how different stimuli affect body ownership and proprioceptive drift in subjects. Many RHI experiments involve exposing subjects to

stimuli that alter their stress levels, however, many of these experiments involve stimuli that represent an immediate physical risk to the rubber hand. Very few have tested the effect of emotional stimuli with the Rubber Hand Illusion. By monitoring subjects' stress levels while watching a clip from an action movie and then putting the subjects through the RHI we will test to see whether or not emotional stimuli that are not immediately present affect the subjects' sense of body ownership. We hypothesize that increased stress levels will correlate with a lesser sense of body ownership and increased proprioceptive drift when compared to a control group that experiences no stimuli.

Elizabeth Hermes (Stephen Stelzner, Psychology) The Effect of Mental Imagery on Intrinsic Motivation, Early Performance Statistics and Perceived Team Cohesion in Women's Collegiate Ice Hockey

This study examined the impact of mental imagery on intrinsic motivation, early competition performance, and team cohesion in collegiate ice hockey players. A secondary purpose was to determine whether team cohesion or team motivation correlated stronger to team performance.

Hannah W. Hoppe (Abraham Immelman, Psychology) The Political Personality of Prospective 2016 Republican Presidential Nominee Donald J. Trump

Biographical and life history data concerning Republican presidential candidate Donald Trump were collected from media reports and synthesized into a personality profile using the third edition of the Millon Inventory of Diagnostic Criteria (MIDC), which yields 34 normal and maladaptive personality classifications congruent with DSM-5. Trump's predominant personality pattern was found to be Ambitious / self-serving (a measure of narcissism) with secondary features of the Dominant / controlling and Outgoing / gregarious patterns. In summary, Trump's personality composite can be characterized as a "high-dominance charismatic." Keywords: Donald Trump, psychology, personality, leadership style, 2016 presidential election

Hannah W. Hoppe (Robert Kachelski, Psychology) Beliefs About Potential Effects of Optimism

It is engrained in our society that optimism and a positive outlook are the keys to our happiness and health. The purpose of this study was to study perceptions of optimism and a positive mental attitude and its impacts on physical health. I also wanted to see if this translated to mental health. This could explain some of the stigma surrounding asking for help with mental illness.

Participants completed in a survey that contained three separate questionnaires. The first was the Revised Life Orientation Test (LOT-R), which measured dispositional optimism of the participants. The next was the Prescribing Optimism Questionnaire, which measured how helpful participants believed optimism would be in treatment of a mental or physical illness. The last was the Positive Mental Attitudes Questionnaire, which measured perceptions about the disadvantages, advantages, and impacts optimism has on physical and mental health. Analysis found significant results that the effect of how much someone prescribed optimism based on type of illness was impacted by the amount of control it was deemed a patient had over his or her illness. There were also significant correlations between self-reported optimism scores and how advantageous participants thought a positive mental attitude would be.

Rebecca Humbert, Stephanie Besst (Pamela Bacon, Psychology) Student Perceptions and Ratings of Mediocre Male and Female Professors

Prior research has shown differences in student's evaluations of male and female professors. This study was designed to examine if these gender differences occurred in mediocre professors. Participants read a mediocre female or male candidate's teaching philosophy and an evaluation by a colleague. They were then asked to evaluate the candidate. The materials were identical except for the gender of the candidate.

Katherine Jennissen, Timothy Immelman, Jeremy Reller, Brianna Kupser, Samantha Womeldorf, Joe Trenzeluk (Abraham Immelman, Psychology) The Personality Profile of 2016 Presidential Contender John Kasich

Biographical and life history data concerning Republican presidential candidate John Kasich was collected from media reports and synthesized into a personality profile using the third edition of the Millon Inventory of Diagnostic Criteria (MIDC), which yields 34 normal and maladaptive personality classifications congruent with DSM-5. The poster describes Kasich's personality profile and outlines its implications for political leadership.

Theodore Kainz, Maggie J. Katzenmaier, Mariah G. Williams (Robert Kachelski, Psychology) Group Identity Priming and Its Effect on Social Behaviors

Previous research suggests that making people aware of different aspects of their identities influences their behavior in a group setting. The purpose of our research was to determine if reminding participants of their group or gender identity would influence who they chose to sit by in a controlled setting. To prime different aspects of their identities, each



participant was assigned to one of three groups. The Gender Identity Priming group read a passage emphasizing the unique culture and aspects of either CSB (for female participants) or SJU (for male participants). These passages were designed to make participants' gender identity more salient. The Community Identity Priming group read a passage emphasizing the shared culture and values of the two institutions and their students. This passage was designed to make gender identity less salient and the participants' broader identity as part of the CSB/SJU community more salient. The Control group did not read a passage at all. All participants were then directed to a room with one male and one female confederate, each seated at different tables that were equidistant from the door. Participants were told to sit wherever they liked. The Control group provided a baseline measure of students' natural tendency to sit with a member of the same gender. Based on previous research, we predicted that reminding participants of their gender identity would increase the likelihood that they would sit by a member of the same gender. In contrast, reminding participants of a shared identity as part of a larger community was predicted to decrease the likelihood that they would sit by a member of the same gender.

Meghan Keaveny, Hannah Beise, Anna Lindstrom, Taylor Ziermann (Eamonn Arble, Psychology) The Effects of Distractions on Reading Comprehension

The purpose of our experiment was to determine how different types of distractions affect reading comprehension. In order to test this, we had participants read an excerpt and complete a series of questions on a selected reading. One group had no distractions (control), a second group listened to Mozart while reading, and a third group had to circle specific articles in the text while reading. Reading comprehension scores across the three groups will be compared to see if different types of distraction differently affect reading comprehension.

Katie M. Langer, Angela M. Charley, Christine M. Koch, Jessica L. Furth (Eamonn Arble, Psychology) The Effect of Mood Generated by Music on Word Choice

The purpose of our experiment was to determine whether different types of music would affect mood, measured by word choice. In order to test this, we had participants complete a multiple-choice questionnaire following the independent variable presented to them. In each question participants had the opportunity to complete the prompt with a word that had a positive, negative or neutral connotation. The study consisted of three groups; one listened to an uplifting song, one listened to a serious song, and the control group, who listened to no song. The questionnaire was used to interpret how the participants' moods were impacted by either the type of music, or the absence of music.

Ellen Munshower, Jaime Purdie, Ellen Arnold, Lucas Friederichs, Sarah Griffin  
(Linda Tennison, Psychology) Anxiety Response with the Rubber Hand Illusion

The rubber hand illusion has been found to create a false sense of belonging and proprioceptive drift. We believe that in replication of the rubber hand illusion, a subject's level of stress will rise when the rubber hand is threatened. To set up a study of this phenomenon, an administrator will begin a standard rubber hand illusion. Once the illusion has been established, a second administrator will simulate spilling hot liquid on the hand. We predict that the subject will have a heightened sense of alarm at the coffee being spilt on the rubber hand and that this alarm will be related to the degree to which the rubber hand illusion is successfully induced. This will be measured by a cardio pro biofeedback system measuring skin conductance of the subject to measure the stress response.

Hanae Nakamoto, Catherine Lundstrom, Christian Grande, Jacob Wankel,  
Timothy Immelman, Joe Trenzeluk, Atarah Pinder (Abraham Immelman,  
Psychology) The Personality Profile of 2016 Presidential Contender Bernie  
Sanders

Biographical and life history data concerning Democratic presidential contender Bernie Sanders was collected from media reports and synthesized into a personality profile using the third edition of the Millon Inventory of Diagnostic Criteria (MIDC), which yields 34 normal and maladaptive personality classifications congruent with DSM-5. The poster describes Sanders's personality profile and outlines its implications for political leadership.

Atarah Pinder (Abraham Immelman, Psychology) The Political Personality of  
Prospective 2016 Republican Presidential Nominee Ted Cruz

Biographical and life history data concerning Republican presidential candidate Ted Cruz were collected from media reports and synthesized into a personality profile using the third edition of the Millon Inventory of Diagnostic Criteria (MIDC), which yields 34 normal and maladaptive personality classifications congruent with DSM-5. Cruz's primary personality pattern was found to be Dominant / forceful, with secondary Ambitious / confident and Dauntless / Adventurous features and less prominent Outgoing / congenial and Contentious / resolute tendencies. In summary, Cruz's personality composite can be characterized as a "risk-taking, confident controller."

Keywords: Ted Cruz, psychology, personality, leadership style, 2016  
presidential election

Angelica Reyes, Maggie Gauer, Lauren Rabe, Hannah Lendino (Eamonn Arble, Psychology) The Effects of Gender Stereotypes on Perception

The purpose of this study is to test whether the awareness of gender stereotypes affects the way participants perform when completing tasks. In order to test this, participants completed one spatial reasoning task, which involved a basic paper-folding test, and one perception task, which involved a 12-item trait-perception worksheet. The experimental group received a gender stereotype about spatial-reasoning skills in addition to the standardized introduction while the control group solely received the standardized introduction. We were interested in seeing whether being exposed to gender stereotypes would result in a significant difference of total correct items on the paper-folding test between the experimental and control group. In addition, we also wanted to see whether being exposed to gender stereotypes affected overall perception of positive traits according to one's gender.

Lindsey Rudquist, Katlin Rice, Alec Peterson (Robert Kachelski, Psychology) The Effects of Stereotype Threat on a Sequential Memory Task

Prior studies indicate that the presence of stereotype threat can influence the accuracy and speed with which tasks are completed. Briefly stated, people tend to perform worse in situations where a negative stereotype about a group to which they belong is made salient. The purpose of our research was to test whether a gender stereotype would affect participants' performance on a test of sequential memory. To measure sequential memory performance, participants played on online version of the game Simon, in which the task is to remember sequences of colored lights and reproduce them in the correct order. Before completing the Simon game, participants were randomly assigned to one of two groups who received slightly different instructions. The control group just received the general instructions for the Simon game. The experimental group received the same general instructions, but were also told that women tend to outperform men on measures of sequential memory such as this. Half of the participants in each group were men and half were women. This allowed us to test whether the stereotype threat negatively affected men's performance by comparing the men in the experimental group to the men in the control group. We were also able to test whether the gender stereotype information improved women's performance by comparing the women in the experimental group to the women in the control group.

Conner R. Strong, Ryan K. Fogarty, Ryan B. Lembke, Ryan T. Miller (Linda Tennison, Psychology) Auditory Interference and the Rubber Hand Illusion

The purpose of this study is to investigate the relationship between listening attention and the rubber hand illusion. The whole illusion works on the manipulation of the body's different sources of sensory input. In the RHI there is a mismatch between proprioception and vision, and the stronger visual sensation creates an illusion that the rubber hand is one's own which can lead to a feeling of ownership. One way to further manipulate the senses of the rubber hand illusion is to add another sense. From general observation and knowledge it is known that attention and focus impacts activities. One such way to change attention is to provide an additional distraction to focus on. Therefore, it is our belief that a relationship may exist between the current rubber hand illusion and a listening distraction serving as a change in attention. The introduction of auditory stimulation and a change in focus should cause a reduction in the effect of the rubber and illusion.

Joseph Trenzeluk (Abraham Immelman, Psychology) The Political Personality of 2016 Republican Presidential Hopeful Marco Rubio

Biographical and life history data concerning Republican presidential candidate Marco Rubio were collected from media reports and synthesized into a personality profile using the third edition of the Millon Inventory of Diagnostic Criteria (MIDC), which yields 34 normal and maladaptive personality classifications congruent with DSM-5. Rubio's primary personality pattern was found to be Ambitious / confident and Outgoing / congenial, with secondary Conscientious / respectful and Accommodating / cooperative features. In summary, Rubio's personality composite can be characterized as an "ambitious, charming, cautious pleaser."

Keywords: Marco Rubio, psychology, personality, leadership style, 2016 presidential election

## **Sociology**

Nicole Argudin, Nicole Kelly, Sheng Her, Tanner Heinselman (Sheila Nelson, Sociology) Homelessness and Panhandling in Las Vegas, Nevada

This project evaluates panhandling and homelessness in Las Vegas, Nevada. Homelessness and panhandling has been a growing issue for Las Vegas. The tourist trade means more opportunities for those who panhandle for a living. We present data on the homeless population in Las Vegas, how many panhandle for a living, and how the Las Vegas government is handling the issue through policies and by collaborating with non-profit organizations.

Anna Cron (Jessica O'Reilly, Sociology) Indigenous Resilience

Indigenous peoples have had to adapt their traditions and cultural practices as climate change impacts their every day lives. This is known as “indigenous resilience.” Resilience refers to a person’s or a group of people’s ability to cope and recover from abrupt change. Indigenous people, while maintaining their cultural identity, have had to withstand shocks caused by climate change, but how long before their cultures are wiped away? Using ethnographic research gathered during my time as an NGO observer at the UNFCCC COP 21 in Paris, I will discuss how policy makers should consult indigenous peoples' traditional knowledge when developing effective solutions to climate change.

Danyal Dawson, Gao Moua, Alex Castellanos, Lovell Murphy (Sheila Nelson, Sociology) Access to Clean Water in Flint, MI

This case study focuses on the city of Flint, Michigan. Flint is the seventh largest city in Michigan. Known as the “Vehicle city” because it was the home of GM motors for many years, deindustrialization hit this city especially hard and intensified the problems typical to urban areas. After studying the history and the demographics of Flint, we chose to examine the current water crisis that the city is facing. We trace the causes of this crisis that erupted in April of 2014 and consider the many sides of this issue; we analyze the political, economic, and social forces that also play a role in the current crisis the city is facing. We will also examine the impact the water problem is having on the residents and reputation of Flint, and make recommendations for the city's future.

Danielle DeBlieck (Jessica O'Reilly, Sociology) Barriers to Renewable Energy Development

Although renewable energy development is a critical piece in transitioning away from a dependence on fossil fuels, there are barriers that must be overcome in order for development to take place. What are the barriers to renewable energy development beyond the financial and technical implications? Social and cultural barriers have played a seemingly less significant role in terms of the implications of renewable energy development, whereas, financial and technical barriers are the primary focus. However, the greatest barrier has yet to be mentioned. Through observation and examination of the United Nations Framework Convention on Climate Change (UNFCCC) proceedings at the 21st Conference on the Parties (COP21), it has become clear that political barriers and lack of political implementation have the most significant role in renewable energy development. Despite these obstacles, there are initiatives being taken all over the world in order to overcome these barriers, many of which were presented at COP21.

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Diana Elhard (Jessica O'Reilly, Sociology) State Participation in International Organizations: Climate Change and Human Mobility in Bangladesh

Globally, 200-700 million persons are at risk of displacement due to the effects of climate change. Within Bangladesh between twenty and thirty percent of the population, roughly forty million people face this risk. I test international relations theories in explaining state participation in international organizations (IOs). Explaining state participation in IOs requires renewed attention in light of increasing global challenges, like climate change, with varied domestic implications. Material benefits, state identity, and mobilization of like-minded actors each provide possible explanations. States seek appropriate solutions to their particular challenges and IOs may fill this need. I focus on Bangladesh's participation in the Nansen Initiative. The Nansen Initiative is a research based IO begun in 2012 focused on producing frameworks and a protection agenda for responding to cross-borderly displacement resulting from natural disasters or the long-term effects of climate change. I primarily use qualitative data in the form of discourse analysis and process tracing. I find that while the other theories shed light on Bangladesh's participation, indirect material interests provide the clearest insight into Bangladesh's participation in the Nansen Initiative. Currently, literature on material benefits focuses on economic and security future research should take seriously the informational benefits provided by IOs.

Olayemi Fadahunsi (Jessica O'Reilly, Sociology) The Faces of Cop 21

My presentation will be on the faces of COP 21. I will be focusing on the various people that I saw and heard speak on their views and challenges about Climate Change. My research was mainly focused on marginalized people who are affected by Climate Change and what they have done and how they feel about the conference climate Change as a whole. I will be putting still shots from the video I made to capture these moments from the conference.

Stacey Guzman, Vivian Arrendondo, Randy Perez (Sheila Nelson, Sociology)  
Homeless Youth in San Francisco

Homelessness among youth in the U.S. is disturbingly common, with an estimated annual rate of at least 5 percent of those aged 12 to 17. Over 1,500 young people sleep on San Francisco's streets every night. Substance abuse, medical, emotional and mental health problems compound the problem of homelessness for many of them. Literature suggests that comprehensive and tailored services are needed to address both the immediate and long-term needs of these youth. Interventions are needed both to assist those currently homeless and to prevent homelessness among at-risk youth. The aim of this study is to provide sound empirical data on homelessness in San Francisco, while also giving voice to the experiences of those experiencing homelessness. Our hope is that these findings will inform public discussions and provide the basis for thoughtful policy approaches to these issues.

Sarah McLarnan (Jessica O'Reilly, Sociology) Food Security and Climate Change at COP21

Climate and global food security are inherently linked. While there are clear and imminent threats to agriculture as a result of changing climate the issue often remains secondary to discussions of energy production in international discussions. In 2015 the international community gathered at COP21 in Paris in order to address the issue of climate change. Analysis of experience at the conference and review of the draft agreement finds agriculture and food security remain critically under represented issues in international climate change adaptation and mitigation discussions.

Jordanna Schluttner (Sheila Nelson, Sociology) Player Perceptions of the Impact of Gender on Coaching

The goal of this research project is to identify the perceived benefits and challenges of being coached by someone of the same sex and the perceived benefits and challenges of being coached by someone of the opposite sex. Data is being gathered through a Forms-Manager survey which I have generated and distributed to CSB/SJU students in order to

learn about student experiences with athletic coaches. The survey also supplies demographic information and student history with sports. I expect to find significant differences in the way male and female coaching styles are perceived by the athletes. This research is important because, as sports play an increasingly important role in the lives of men and women, the findings will help current and future coaches better respond to the needs of all their players.

Marissa Swegle, Chaltu Doto, Lawanza Montgomery, Briana Soto (Sheila Nelson, Sociology) Homelessness and Unemployment in New York City

Even though New York is home to Broadway, Time Square, and many celebrities, homelessness remains a huge issue. We examine the causes that contribute to homelessness, including unemployment. Then we look at programs currently in place to help alleviate this situation, and provide our own recommendations on how best to help those who are facing homelessness.

Lauren VanGerpen, Athena Ly, Boon Yang, Karissa Ressemann (Sheila Nelson, Sociology) Post-Katrina Poverty in New Orleans

This case study focuses on New Orleans, Louisiana and the immense poverty intensified by Hurricane Katrina and its aftermath. We examine how social forces compounded with the natural disaster and resulted in the hypersegregation of an already disadvantaged community. We propose a plan that attempts to reduce poverty and strengthen community in New Orleans.

Aaron Wildenborg (Jessica O'Reilly, Sociology) The economics of international climate change mitigation

Since the creation of the United Nations Framework Convention on Climate Change (UNFCCC), the question of who will pay for the cost of environmental degradation has been a contentious issue. After profiting from their carbon emissions for years, wealthy countries have been asked to take the lead with regard to financing the transition of developing countries from fossil fuel-based to renewable energy-based economies. Through attendance at climate change mitigation and policy forums at the 21st Conference of Parties of the UNFCCC, I have determined that international climate funding is a burgeoning sector that must be at the forefront of deliberations at next year's 22nd Conference of Parties. After consulting with experts, it seems imperative that the United States and other developed countries contribute to funds such as the Green Climate Fund to incentivize poor countries to invest in clean energy infrastructures, and mitigate global carbon emissions.



### **Environmental Studies**

Maxwell Arko (Christopher Thoms, Environmental Studies) What Else? A Consumer's Guide to Conventional Meat Alternatives

In the U.S. food is primarily produced with the use of industrial farming methods that rely on technological advancements, chemical pesticides and fertilizers, and generally unsustainable practices. Our reliance on the current food system contributes to climate change, carbon emissions, public health crises, and a lapse in ethical standards in the treatment of livestock. Conventional meat production reinforces these negative impacts and an alternative system is desperately needed. I examine alternatives to conventional protein production, specifically comparing aquaculture, organic meats, and vegetarian diets as the most common and economically feasible alternatives. Using an extensive literature review to establish standards for consumer needs and a comparative analysis of individual products, I explore these alternatives and compare their environmental, nutritional and ethical standards to those of conventional meat production.

AnnMarie Backstrom (Jean Lavigne, Environmental Studies) Bike-Safe Routes Between CSB/SJU

Many students use the Wobegon Trail to bike between the College of Saint Benedict and Saint John's University. However, the Wobegon Trail does not connect to either campus, so, as a bike user, it is difficult to find a safe route to avoid major roads. Through using ArcGIS, I will assess and locate the safest biking routes between the College of Saint Benedict and St. John's University. Additionally, I will mark other points of interest like the Outdoor Leadership Center, the Green Bike rental program through CSB campus recreation, the Link bus stops, and the future bike fix-it station. The Minnesota Department of Transportation, ArcGIS online, and Stearns County dataset have been useful information to produce my map. In conclusion, I will be making one map that will be easily readable for CSB/SJU students to use to find the best and safest biking route between the two campuses.

Austin Battig (Christopher Thoms, Derek Larson, Environmental Studies) Positives and Negatives: Household Batteries and the Need to Properly Dispose of Them

According to the Environmental Protection Agency, there are over three billion household batteries purchased and discarded annually in the United States. Although household batteries are often labeled as disposable, the improper disposal of household batteries negatively

affects the environment. Since many batteries are labeled disposable, household batteries are most often thrown away even though most batteries can be recycled. The need to begin recycling batteries is high so that we do not continue introducing these large amounts of e-waste into the environment. Through this project I seek to understand why people do not recycle their spent batteries. After I examine the environmental impacts of disposable and rechargeable batteries, I study the psychology of recycling to see when and why people decide to recycle their waste. Recycling procedures for household batteries aren't well known, but there are places to properly dispose them.

Brandon Berthiaume (Christopher Thoms, Environmental Studies) The Consumption of Specialized Outdoor Equipment

Every year millions of Americans engage in some form of outdoor recreation such as hunting, fishing, or camping. Collectively, people spend billions of dollars in outdoor recreation that directly affects the environment and the consumers. This research attempts to connect the specialization of this equipment with the general trends of consumers and the environment. Activities like fishing rely on heavily specialized products that directly relate to wildlife populations, pollution of ecosystems, and consumers perception of the recreation itself. By conducting scholarly research regarding consumption of outdoor products such as fishing lures, fishing line, and hunting equipment and their effects on consumers and the environment I find evidence showing the vast specialization of outdoor products. Specialization of outdoor equipment has given large companies much power in defining the outdoors and leads to outdoor participation requiring increasing amounts of consumption.

Megan Diliberti (Christopher Thoms, Environmental Studies) Energy Consumption: Urban Heat Island Effect and Particulate Matter

This study looks at energy consumption in rural and urban areas. It examines how increased consumption leads to and is caused by the urban heat island effect (UHI). UHI increases temperatures in urban areas and can have negative health effects on citizens. The study also looks at the particulate matter caused by UHI and potential mitigation solutions. A secondary analysis of case studies in the United States and other countries show how the UHI in urban areas decreases health and increases energy consumption. With these problems in mind, I conclude that the most effective mitigation strategy involves urban planners as opposed to a simple, all-encompassing policy decision.

Megan Diliberti (Jean Lavigne, Environmental Studies) HMML Research Locations

HMML commissioned this map to help show people where they have gathered historical materials, and where they are working now. The data was given to me by HMML and has the locations of their current and past sites. To create these maps, I use ArcMap. One map shows a broad worldview while the other two are focused on Iraq and Syria and Europe.

Maria Friedges (Jean Lavigne, Environmental Studies) Where exactly was Indianbush?

The monks at Saint John's University founded the community and the college experience. Their movement from the Saint Cloud Priory to Saint John's was the origin of the community. There are historical references of an original "Indianbush", the spot where the monks first settled after they moved from the Saint Cloud Priory but the actual evidence of the buildings is gone. The purpose of this project was to find the area of where the Indianbush settlement was, using references and old maps and then pinpointing a more exact location based on specific measurements. To find the Indianbush settlement, aerial and satellite photographs of the Saint John's University Arboretum, Collegeville, old and new Arboretum trail maps, roadways, and GPS coordinates were used. One map shows general locations of interest that could have been possible sites of the Indianbush settlement of the Saint John's monks based on hand-written reports. Other maps display a more specific location of the Indianbush settlement based on findings, references, and historical evidence.

Peter J. Hamel (Jean Lavigne, Environmental Studies) Disc Golf

The disc golf course at Saint John's University provides an opportunity for students to have some fun in the sun, however the lack of effective signs or maps makes it difficult to navigate through the course. The main goal of this project is to provide an effective map that students can use to help them navigate through the course smoothly. In order to do this I used GPS coordinates of the tee box and basket for each hole along with an areal image of the course to produce a readable map. One side of this map includes markings for the tee box, basket, fairway, rough, trees, water hazards, and an arrow indicated the direction to the next tee box. The other side contains information about each hole such as the distance to the basket and par for the hole. The end product is very similar to the scorecards used by golf courses.

Pearce R. Jensen (Christopher Thoms, Environmental Studies) THE EFFECTS OF GARBAGE POLLUTION ON THE SOUTH AND EAST CHINA SEA & POSSIBLE SOLUTIONS

Plastic pollution in the world's oceans is a worldwide issue. One of the worst areas where this has been documented is the South and East China Sea. As these areas have experienced a large influx of pollution over the past two decades it is important to investigate impacts on the marine ecosystems of this area and potential solutions. Secondary analysis was conducted on a variety of sources including biological impact articles and waste management analyses. From this research it is apparent that this pollution has had detrimental effects on the marine ecosystem. In order to combat this issue, improvements in government policies of waste management must be addressed.

Anne E. Johnson (Jean Lavigne, Environmental Studies) Minnesota Street Market Sourcing Locally

The Minnesota Street Market is a local food and art co-op in Saint Joseph, Minnesota that seeks to provide customers with ethically sourced and local products. A visual representation of where the Minnesota Street Market buys their products would give customers better knowledge of the co-op's mission. The Minnesota Street Market has data on where all of their products come from, the contact information of every supplier, and what specific department(s) each supplier contributes to. This presentation will consist of two maps: one showing all the suppliers in Minnesota and Wisconsin, the second map showing the specific suppliers in Saint Joseph and the surrounding area. These two maps will be displayed as a visual aid for employees and customers at the Minnesota Street Market, and will also be displayed on the website.

Brian M. Koch (Christopher Thoms, Environmental Studies) Hydrogen Vehicles: A Sustainable Look at the Transportation Sector

Transforming the transportation sector is vital to it becoming more sustainable due to the increasing number of vehicles being driven today. In this paper I examine the challenges and opportunities of hydrogen fuel cells, biofuels, and electric vehicles to consider a viable option that could transform the transportation sector. After careful examination and analysis of various sources, I find hydrogen fuel cell technology to be the most effective and efficient alternative to implement into the transportation sector. Hydrogen can be produced with little-to-zero emissions with the help of renewable energy and it may also ensure security of energy supplies and create a new industrial and technological energy base, which is crucial for economic prosperity.

Brian Koch (Jean Lavigne, Environmental Studies) Outdoor College Orientation Programs and Their Proximity To Public Lands in the U.S.

Many college/university students are confronted with a number of serious health and social issues such as depression and anxiety. Getting outside and getting active has shown positive influences on people's mental and physical health. It is vital for universities that offer outdoor orientation programs near U.S. public land to expose that information. This project documents the locations of 4-year colleges/universities and their proximity to U.S. public lands. By using a research study that has taken a "census" of various orientation programs at 4-year colleges and universities, I can document not only the list of the programs, but show their distances to lands in which the programs can utilize for outdoor recreation.

Mitchell J. Lampe (Christopher Thoms, Environmental Studies) The Tiny House Movement: Living Sustainably in a Big Way, but with Little Room

This study examines the recent and growing trend of the tiny house movement and its effects on personal and communal consumption of Americans living in urban areas. Growth in the size and number of homes since the 1940s has led to suburban isolation and greater individualized consumption. Expansion of spread out suburban areas ultimately leads to higher levels of resource consumption as opposed to more concentrated city living. Through secondary analysis of residential consumption data, prior tiny house studies conducted by graduate students, city planning processes, and personal accounts of tiny home owners, I determine that the implementation of smaller houses will improve urban and suburban communities by saving money, resources, emissions, and reduce psychological hardships brought on by consumerism.

Mitchell J. Lampe (Jean Lavigne, Environmental Studies) Increasing City Density with Accessory Dwelling Units

With human populations continuing to increase and urbanize, city life is expanding and consuming more resources the further suburbia stretches. As part of the Tiny House Movement, accessory dwelling units are a potential solution to the affordability and density problem cities face in the near future. These small detached units are constructed on presently owned land and provide a cheap and easy way to add additional housing without the need of further development outside city limits. Using GIS parcel data on Minneapolis, my project will evaluate whether there are enough houses with larger enough properties inside the city to effectively increase density using accessory dwelling units.

Jonathon Litchy (Jean Lavigne, Environmental Studies) Kolkata Study Abroad Guide Map

This map displays the important landmarks, college, housing, and other points of interest in Kolkata, India. It allows students to have a useful map to guide them through the bustling city. The goal of this project is to provide the Study Abroad Office with a map that will help students travel from their home stay location to St. Xavier's College. It will allow them to adjust to the city and enable them to find the metro stations without getting lost for the first weeks of studying abroad. The data consists of points of interest from past study abroad students and the location of home stays in correlation to the college. Background data of roads, buildings, and metro transit stations are supplied from an ArcGIS world street basemap. An additional goal for the map will be to locate some hotspots to delve oneself into the culture of Kolkata, to find some unique dining locations, and markets for clothing, jewelry, ect.

Megan M. Lundquist (Jean Lavigne, Environmental Studies) Mapping Study Abroad: The Guatemala Experience

For many students, a study abroad program is the first time they will be travelling and living in a particular area abroad. As students go abroad to a variety of locations, they may need maps to help orient them to their living spaces, where their classes are, culturally important locations, and popular places to gather after school. Using ArcGIS, I will plot important locations based on what locations the participants in the Guatemala program found important to their study abroad experience. I will assign attributes to the locations so that the user can identify different types of locations like restaurants, class locations, and service learning sites. This map will be helpful to new students in the program in providing a resource to get around, as well as showing what past groups identified as important to experiencing Guatemala.

Ariel F. Lusty (Jean Lavigne, Environmental Studies) Using GIS Maps to Demonstrate the Viability of a High School in St. Joe

The PTA in St. Joseph is in the process of trying to convince School District 742 to build a new high school in St. Joseph down the road from Kennedy Elementary.

Environmental Studies professor and St. Joseph PTA member Derek Larson has requested several GIS maps illustrating the viability of constructing a high school in this location. These maps illustrate the potential to attract students from outside the current district boundaries. The maps also show that a west-side school would better serve students living on the western side of the current boundaries. Census data from American Fact Finder is used.

One map will show population density in School District 742. Another will demonstrate the number of potential students within different radii of the proposed high school location, and another, the proportional division of the current district boundaries in 3 zones instead of the current two, with one being on the west side.

Sarah McLarnan (Christopher Thoms, Environmental Studies) Policy More Effective than Programming in Mitigating Food Waste

In the United States 1.3 billion tons of food waste enters landfills each year, producing environmental and economic concerns, and contributing to global food insecurity. Efforts to address this issue have diverged into two categories of action: policy and programming. Negligible research exists on which of these categories is most effective in addressing food waste. This study compares policies in San Francisco and Massachusetts with programs implemented by Minneapolis and the College of Saint Benedict/Saint John's University for success in addressing the educational, infrastructural, and institutional drivers of food waste. Assessment of mitigation efforts finds policy is more effective than programming in addressing this issue and should be the preferred mechanism for a large scale reduction of food waste in the future.

Alec P. Minea (Jean Lavigne, Environmental Studies) Athens Study Abroad Map

Every year hundreds of CSB/SJU students participate in study abroad trips, living in a new city, in a foreign country, for anywhere from several weeks to several months. One of these study abroad sites is Athens, Greece. In order to help students adjust to life in Athens, and find their way around the city, I have created a map showing important locations in Athens, including student housing, the location of the school, and other points of interest. Using ArcGIS and street maps of Athens acquired from the ESRI database I have created a map that lays out the most important features that students will need to know about the city, and, hopefully, it will help them as they begin their trips.

Robert Otting-Crandall (Jean Lavigne, Environmental Studies) Youth Baseball in the South Metro

I will be working with a community member to map baseball field locations for parents in the South Metro to use to navigate to youth baseball games. Using provided data and the ArcGIS program, I will assign features and digitize locations to better enable the community to access baseball fields. I will be coordinating with the coaches to receive data. This project will be a demonstration of how maps can better serve the community and youth programming.

Brooke Piepenburg (Jean Lavigne, Environmental Studies) The Impact of Nest Box Location on Tree Swallow (*Tachycineta bicolor*) Nestling Success

When selecting a nesting location, Tree Swallows (*Tachycineta bicolor*) must take into consideration the surrounding land coverage to ensure the success of their offspring, as predator threats may be more or less prevalent within certain ecological environments. This project was designed to create a map of successful Tree Swallow nestling fledging relative to the land coverage in areas surrounding nest box locations within the Saint John's Abbey Arboretum and Kraemer Lake-Wildwood County Park in Stearns County, Minnesota. Data utilized in this study included a map of the land coverage within Stearns County from Stearns County aerial photographs within the College of Saint Benedict and Saint John's University Environmental Studies Department S:\ Drive, GPS Coordinates of nest box locations within the Saint John's Abbey Arboretum and Kraemer Lake-Wildwood County Park, and the frequency of successful nestling fledging from these nest boxes from the summer nesting seasons between 2012 and 2015 taken from the collected data of the College of Saint Benedict and Saint John's University Summer Biology Research Fellowship project under the mentorship of Ms. Carol Jansky. The resulting map will be presented at the 2016 Scholarship and Creativity Day at the College of Saint Benedict and Saint John's University; the map will be used to illustrate the success of Tree Swallow offspring fledging relative to the land coverage surrounding the corresponding nest box.

Jack E. Pietruszewski (Jean Lavigne, Environmental Studies) Minnesota Muskies: Displaying Professional Secrets For Catching Trophy Muskellunge

The muskellunge (also known as musky) is the most elusive and largest ambush predator that swims Minnesota's lakes. Catching a musky is fulfilling, yet professional anglers accomplish this difficult task with ease leaving average anglers frustrated and defeated. In my study, I investigate professional anglers' secrets for catching trophy musky, specifically targeting the musky composition of lakes these professionals angle. This project examines surveyed data collected by the Minnesota Department of Natural Resources, which reveals the average size and abundance of musky present in indigenous versus introduced musky lakes. Analysis and mapping of this data displays that the best chance to catch the fish of a lifetime is located in native musky waters rather than introduced lakes. The average catchable size and abundance of muskellunge is greater in indigenous musky lakes; therefore, indicating that professional anglers' success derives from constantly fishing these indigenous bodies of water.



Jack E. Pietruszewski (Christopher Thoms, Environmental Studies) Redefining Masculine Protein Consumption: Environmental and Physiological Benefits of Eating Soy Protein

Whey protein dominates the sports nutrition industry, partly because soy protein powder possesses a feminizing connotation due to its vegetative origin. This has led to harmful mis-consumption. Excessive consumption of whey protein causes negative environmental and physiological impacts. In my study I investigate soy as a more sustainable yet equally effective alternative to whey protein. This study contrasts soy and whey protein powder using a literature review of clinical experiments, personal testimonies, and questionnaires answered by the St. John's Football team. Analysis of these data demonstrates that soy protein provides environmentally friendlier protein consumption, enhances muscle recovery, and adds the benefit of preserving antioxidant functions within the body.

Matthew J. Remer (Jean Lavigne, Environmental Studies) Mapping Alumni Locations for the School of Theology

Mapping the alumni locations for the Saint John's School of Theology can help to create a better knowledge of how to plan alumni events and other events to create a greater alumni outreach. The goal of this project is to create maps that will show the locations of alumni from the School of Theology. For the project I will produce 3 maps showing alumni locations in Minnesota, in the United States, and on a world map. These maps will be produced by using Arc GIS technology using the data that is provided to me. This data will consist of each alum's home location in an excel sheet that was provided to me by the School of Theology. I will be able to enter this data into the GIS program and create maps that will display these locations. These maps will be used to create a better outreach program for the alumni of School of Theology.

Matthew J. Remer (Christopher Thoms, Environmental Studies) Green Consumption: Can it Change our Consumption Habits

Consumption plays a large part in environmental degradation and green consumption is an increasingly popular solution. The question I focus on is whether green consumption can reduce total consumption and waste production. Through secondary analysis of a survey on consumer interest in green products, I will describe the effects of education, price, gender, environmental attitudes, eco-labels, and consumption behaviors on green consumption. Although green consumption can increase environmental awareness and efficiency of production, it also causes an increase in consumption and in turn an increase in waste production. Because of the increased production efficiency there is also an increase in production

causing an increase in consumption and waste production. Without behavioral changes of individuals, green consumption alone cannot decrease consumption and waste production.

Benjamin T. Rosburg (Christopher Thoms, Environmental Studies) Technology in Fishing: Have We Gone Too Far?

Increased use of underwater cameras and other technology in ice fishing is raising ethical and policy questions. In 1998 the Minnesota state legislature considered but rejected a ban on the use of underwater cameras. To understand user and regulator perspectives on the ethics and potential disruption of underwater camera use, I interview Minnesotan anglers and DNR officials. In addition, a review of the literature, the 1998 legislation, and popular media accounts of emerging fish finder technology provides an historical perspective. Many anglers are against the use of underwater cameras while fishing and support regulating their use. Furthermore, DNR officials were also against the use of underwater cameras while fishing and in favor of regulating their use when underwater cameras first emerged, while continuing to monitor the potential impacts that they are having today. Based on these findings, I argue that underwater camera use should be regulated and a change is needed in the ethical mindset of anglers in regards to ice fishing.

Devon Savage (Christopher Thoms, Environmental Studies) Current Issues: Centralized vs. Decentralized Energy Distribution

Centralized energy distribution is more popular than decentralized energy distribution all over the world. Decentralized energy distribution is a smaller scale operation with the potential to decrease greenhouse gas emissions and energy loss over transmission distance. This form of distribution could be especially beneficial for rural towns in Minnesota economically, environmentally, and socially if the towns are far from an electrical generation source. Each distribution system was analyzed for wind, solar, coal, and natural gas energy generation. The identification of cost, area, and social acceptance of each method using example towns with varying locations and populations helped to determine which method is most viable. Although renewable generation methods are costly and require certain environmental conditions for effective production, they could at least be a complement to conventional methods of generation in decentralized distribution systems.

Devon Savage (Jean Lavigne, Environmental Studies) Canine Safety Routes

Dogs can sometimes be hostile to one another and this can be a problem when sharing a sidewalk with another person with a dog. A map of dog license holders and local canine characteristics in a neighborhood of St.

Joseph would be beneficial for someone who is looking for walking routes so their rescue dog can avoid running into other dogs. This can be used for other people that would like to avoid canines in the neighborhood as well. This map would ensure the safety of animals and owners for future walking endeavors.

Natalie Stoneburner (Christopher Thoms, Environmental Studies) Diversity in Outdoor Education: How St. John's Outdoor University can more directly benefit Somali students

As the proportion of Somali immigrant or refugee children in classrooms has grown in St. Cloud over the last twelve years, the area school district isd742 has faced noteworthy barriers in providing an education accessible to all students. St. John's Outdoor University must also adapt to the changing St. Cloud population they serve within the constraints of outdoor environmental education field trips. Existing research indicates that children from diverse backgrounds have diverse learning needs. To better understand the learning needs specific to St. Cloud's Somali population, I interviewed area educators and Somali community members. St. John's Outdoor University can learn from how other educational institutions have addressed the needs of diverse students in order to more directly benefit students from St. Cloud's Somali population.

Erin Stout (Christopher Thoms, Environmental Studies) Finding Natural Ground: Sustainable Residential Flooring

The most common residential flooring materials are carpet and laminate, which have environmental impacts that consumers are generally unaware of. This research examines sustainable flooring materials, consumer goals for flooring, and develops a consumer guide to match consumer goals with sustainable flooring options. Through an extensive review of industry trade journals I compared the material characteristics of four flooring materials. Through interviews with people in the flooring business I found that the top four consumer goals were aesthetics, durability, cost and air quality. I then created a consumer guide comparing consumer goals with flooring options. Overall I found that domestic hardwood oak meets the most consumer goals and is the most sustainable material. This research will help consumers better understand the impacts of flooring material on the environment and can help them find a sustainable material that meets their goals.

Erin Stout (Jean Lavigne, Environmental Studies) College of Saint Benedict Alumnae Location and Demographics

After graduation from the College of Saint Benedict, many alumnae relocate to different places around the world. It is important to identify the location and demographics of alumnae in order for Alumnae Relations to continue providing the St. Ben's tradition of community. This leads to the question of where the College of Saint Benedict alumnae live after graduating. The goal of the project is to produce maps that present the location of CSB alumnae with demographic information overlaid. The data was collected by Alumnae Relations and consists of 23,000 CSB alumnae. The data includes alumnae geographical location and demographics such as city of residence, class year, employment type, number of alums who attended an event held by the Alum Relations, and the number of alums who have donated. This map will show the location and demographics of alumnus and will be useful for Alumnae Relations to continue fostering relationships among current students, the Saint Ben's community and alumnae around the world through programming, special events, volunteer opportunities and financial gifts.

Madison K. Sundlof (Christopher Thoms, Environmental Studies) LEED: Should it be the leader in sustainable construction?

Currently, in America 39% of the total energy is consumed by commercial buildings each year. Due to this inefficiency, various certifications have emerged in the construction industry to reduce its environmental impact. Leadership in Energy and Environmental Design (LEED), a rating system rewarding owners for sustainability efforts, has led this movement for the past 20 years. Although it raised awareness of the sustainable design options available and educated companies about design techniques, it is not enough to meet the demands or expectations of owners. Through my research on the practices of LEED, interviews with professionals in the field, and a comparison to three other standards, I conclude that LEED is no longer the best option on the market. Ultimately, the best choice for an environmentally conscious builder is to either adopt a more stringent certification or employ a qualified design team to customize a building that fits their environmental goals.

Madison Sundlof (Jean Lavigne, Environmental Studies) Benedictine Art at SJU

Across the Saint John's campus there are a number of historically rich art pieces linked to Benedictine tradition. The artwork has been extensively researched for its theological history and has been viewed by many visitors on the campus. The map produced will act as a guide for those wishing to view the artwork, and it will be included in the future in a pamphlet with descriptions and photographs for each piece. Data for this project was collected by Dr. Martin Connell, as part of the

Benedictine Institute, and includes locations such as Rose Windows in the Great Hall and the Benedict Pediment. The map will show where visitors can expect to see theologically important artwork and how to locate each piece.

Peter Thein (Jean Lavigne, Environmental Studies) Study Abroad Australia

CSB/SJU is well known for their Education Abroad opportunities. There are 19 semester programs in 6 different countries, as well as many other short-term programs. The information provided on the CSB/SJU website allows to explore and learn about each of the programs. One item that is missing from the information that would be very helpful is a map highlighting where students live, take classes, points of interest, routes between locations, etc. This information would be helpful for both students deciding on a program, and students already enrolled in a program get a feel for the location and ultimately make them more comfortable. The project would begin by examining the Australia program offered by Education Abroad. The next step would be to gather all of the necessary information and data on the various locations that would need to be mapped out. These would include student residences, the university, and a separate map with points of interest. After that I would use ArcGIS software to turn that data into a visual map that students could understand. Both locations would be mapped out and put on a poster for scholarship and creativity day.

Hang Trinh (Christopher Thoms, Environmental Studies) Maximizing local food sourcing for Saint John University Dining Service

Commercial food production, in compensating for its large scale assembly, is inefficient, creates many negative environmental impacts, requires the use of many nonrenewable resources, and poses potential risks to consumers' health. Colleges and Universities across the United States are making efforts to transition from commercial food sourcing to more local and sustainable options in order to reduce their carbon footprint and provide healthy eating choices for students. However, commercial items are inexpensive and easy to procure compared to local alternatives, creating barriers for institutions to make this transition. The Farm-to-College program has been successfully adopted by many university and colleges to address these barriers. By implementing the Farm-to-College program, Saint John's University could increase its local food sourcing in order to provide students with a healthy and sustainable food option.

Hang Trinh (Jean Lavigne, Environmental Studies) What type of work are CSBSJU students doing in ELCE programs?

Every semester, Experiential Learning and Community Engagement (ELCE) supports over 500 students in gaining work experience and engaging with communities through service-learning, internships, the Bonner Leader Program, and various other community engagement projects. ELCE wants to provide a map showing their partner organizations in order for those who are interested in learning more about ELCE programs to better understand and visualize where students are working and serving in the community. This map will highlight the organizations, provide information about the partners and describe the types of work that students are contributing. It will be shared on ELCE website and potentially used in their annual report and program review.

Bryce Wenberg (Christopher Thoms, Diane Veale-Jones, Environmental Studies)  
Local Foods: A Consumer Guide for the Students of the College of St. Benedict -  
St. John's University

Increasing consumption of local foods among college students can improve overall health and support local community members. Unfortunately, many students do not know how or where to access these types of foods. Through interviews and a review of area grocery stores, I assess local food options. Using these results, I created a comprehensive consumer guide to show students when and where they can access local foods in the area. St. Joseph has many opportunities for purchasing local foods through supermarkets such as Coborn's and Byerly's as well as the Minnesota Street Market which incorporates a variety of local farmers and growers to provide a diverse selection of local foods year round.

Leng Xiong (Jean Lavigne, Environmental Studies) Waste Management Waste Journey

The "out of sight, out of mind" idea has controlled our perception of the world and one thing that people don't really think about is the whereabouts of their trash. Where does our trash end up? More specifically, if your service for trash is the big company WM (Waste Management), where do they drop off your trash? I will be displaying a map of transfer and landfills of WM and also their recycle facilities in Minnesota. The data I will be using is addresses and fact sheets WM has provided along with a Facts Report of CSB/SJU trash and recycle of 2011-2014 that will be used to compare and find the percentage of our contribution to the landfills. I will be making map and data charts for reference. The map will have the locations of the transfers and landfill sites with their sizes in acres and waste accumulations. The data charts will display CSB/SJU trash and recycling accumulation comparing to landfill capacities.

Cheuk Wah Yung (Jean Lavigne, Environmental Studies) Study Abroad Site  
Map for Tokyo, Japan

The Centre of Global Education (CGE) of Saint John's University and College of Saint Benedict offers short term or semester study abroad or exchange programs for students every year. There are 19 semester programs offered on 6 different continents: (Australia, Austria, Chile, China, Coventry-England, France, Germany, Greece and Italy, Guatemala, India, Ireland-Cork, Ireland-Galway, Japan, London, Northern Ireland, South Africa, and Spain). This project focuses specifically on Tokyo, Japan. For students that are interested in joining the program, the project will:

- 1.) Show where students will be living when they are abroad
- 2.) Show where they go to class
- 3.) Provide other points of interest in the neighborhood and in larger Tokyo.

*Peter Engel Science Center 269, SJU*

**Biology**

Ryan E. Buron (Stephen Saupe, Biology) Photosynthetic Response of Smooth Sumac during Autumn Senescence

Photosynthetic Response of Smooth Sumac during Autumn Senescence  
Ryan Buron and Elise Reid (Stephen G. Saupe moderator). Biology Department; College of Saint Benedict/Saint John's University; Collegeville, MN 56321

In the autumn, the leaves of many deciduous trees and shrubs turn brilliant colors. One of the most spectacular is smooth sumac (*Rhus glabra*) whose leaves turn a vibrant scarlet color. These colors are the result of the de novo production of anthocyanin pigments in the leaves. It is not clear why the leaves of smooth sumac and other brilliantly-colored fall plants would produce anthocyanins in leaves that will soon be discarded. The purpose of this experiment was to test the hypothesis that anthocyanin production helps maximize photosynthesis during senescence. Smooth sumac leaves were harvested from shrubs growing in central Minnesota (Collegeville, Stearns County) from Sept. 11 until Oct. 9, 2015. We used a LI-6400XT portable photosynthesis system to measure photosynthetic  $V_{max}$ , light saturation and light compensation points, quantum yield, and dark respiration. In addition, we digitally measured leaf color, which our previous studies have shown to be directly correlated to leaf pigment content. Anthocyanin pigment production was in progress on Sept. 23 and was complete by Oct 2. The quantum yield and the  $V_{max}$  of photosynthesis declined beginning on September 23rd, while the light compensation point increased. These

changes were correlated with a decrease in chlorophyll and an increase in anthocyanin. The rate of dark respiration and the light saturation point remained constant during the senescence period. Our results suggest that the decline in photosynthetic activity is directly related to the loss of chlorophyll and disassembly of the chloroplast. Our prediction that that anthocyanin levels would peak prior to a decline in photosynthetic rate was not supported, which suggests that anthocyanins are not serving to protect the photosynthetic apparatus during senescence.

Karen Casillas, Kaylie L. Bednarczyk (David Brown, Kristina Timmerman, Biology) Gastropod Spatial Distribution and Diversity throughout North Point Intertidal Environments on San Salvador Island, Bahamas

Understanding distribution and abundance of species is the central question of ecology. Intertidal regions have long been an area of research for the large diversity of species they provide. This study examines how gastropods spatially distribute themselves in clusters of similar and differing species on the fossilized sand dune intertidal locations along the northern point of San Salvador Island, Bahamas. We decided to examine how gastropod communities are spatially distributed in the intertidal regions according to species and size. Various gastropod species were collected and identified in order to build a baseline for species diversity. The examination of spatial distribution ensued through surveying intertidal areas for cluster patterns. The impact of our research suggests that gastropod species in the intertidal areas surveyed have little competition between species for resources as they often cluster with other species. Alternatively, the clustering could be to prevent desiccation from wind and sun exposure. While the specific environment (i.e. tidal versus rocky pits and crevices) plays a role in distribution and clustering patterns, this does not provide overwhelming evidence that gastropods have a preference to remain near the same species since some of the clusters consisted of more than two different species.

Ian R. DeVaun, Brian M. Koch, Paige E. Goodman, Claire M. Madden (Kristina Timmerman, Biology) Damselfish and their Effect on the Biodiversity of Algal Species: A Continuation of Research in the Galápagos Islands

The focus of this research project was to determine whether or not there was a statistically significant difference between algal coverage and algal biodiversity between Damselfish territories and non-Damselfish areas. In addition to that, this research addresses potential variations in results due to geographic location and the significance



that annual changes may have. Our hypothesis predicts that there will be significantly more algal biodiversity and algal coverage within Damselfish territories. This hypothesis is based upon Damselfish being a farming fish, and the males' aggressive tendencies to defend their territories from algal predation. In order to test our hypothesis, we built two 50cm by 50cm quads and measured both Damselfish territories and non-Damselfish areas over the span of one week. This research was conducted in the Galápagos Islands on the island of San Cristóbal. We collected data from two separate beaches on San Cristóbal and compared our data to research that had been conducted over the two years prior to our data being collected. Our data collection protocols included collecting data from both beaches each day that data was collected, and that ten Damselfish territories and ten non-Damselfish areas were analyzed during each data collection session. Data analysis included counting the number of different algal species as well as determining the percent coverage of each plot. Statistical analysis was then conducted to determine significance, utilizing a .05 critical value. This research will provide valuable insight into the biodiversity of algal species in marine ecosystems, as well as determine the importance of Damselfish in regards to upkeep of these marine ecosystems.

Brandon C. Franta, Ryan E. Buron (Kristina Timmerman, Biology) Sally Lightfoot Crab Aggressive Behavior and Habitat on San Cristóbal Island

The purpose of this observational experiment was to study the aggressive behaviors and location of Sally Lightfoot Crabs in the Galápagos Archipelago. We hypothesize that if the predators of large, mature crabs are hunting at dusk or night, there will be more aggressive and territorial crabs during the morning compared to dusk, as well as more total mature crabs. We also hypothesize that if more algae (main food source for Sally Lightfoot Crabs) grows in the areas that receive more sun, there will be more Sally Lightfoot Crabs in these areas compared to areas with more shade. We observed the behavior of the Sally Lightfoot Crabs in Puerto Baquierzo Moreno, San Cristóbal Island in the Galápagos Archipelago. We studied the behavior at two different plots, one receiving

significantly more sun than the other. We compared the total number of mature crabs and the number of mature crab interactions in the morning and dusk at both locations. We also compared the number of total crabs located at both locations. This data was collected for six days in the morning and at dusk of each day. We observed that both the total number of large crabs and aggressive interactions involving large crabs in the morning was significantly lower than at dusk. A chi-squared test confirmed our results (p-values less than .01). This data did not support our hypothesis. We also observed that the total number of crabs in the area with more sun was significantly more than the area with less sun. A chi-squared test showed the significance (p-value less than .01). This supported our hypothesis.

Maria Friedges, Paiten Schreiner (Kristina Timmerman, Biology) Can Citizen Scientists Contribute to Pacific Green Sea Turtle (*Chelonia mydas*) Monitoring? A Test in the Galapagos Islands.

The purpose of this study was to investigate the feasibility of “citizen scientists” (such as ourselves) being able to reliably identify Pacific green sea turtles (*Chelonia mydas*). While we are biology students, we had no formal training in turtle identification and, therefore, considered ourselves to be part of the citizen science group. Results from this study will contribute to the incorporation of every-day “citizens” working with scientists. Our study area was La Lobería Lagoon, Isla San Cristóbal, Galápagos Islands, Ecuador. This lagoon is reported to be a favorite place for sea turtles. During the sampling period (19 – 25 July 2015), we snorkeled in the lagoon to document the number of turtles present and what their activity was at the time of observation (within an hour of low tide). Each turtle was photographed to facilitate identification. Photographs were downloaded and the study team used these photos to identify individuals. We were able to identify all turtles observed; photos of facial patterns were particularly helpful in this task (N = 16). Of the Pacific Green Sea turtles identified, three were observed for two or more days during the study period. The mean number of turtles seen per day was 4.8. Based on these results, it is feasible for people not officially trained in wildlife identification to contribute to a scientific database.

Drake L. Matuska (Manuel Campos, Biology) Concussions, Why They Go Unreported

My final project is implementing research/data collection on the underlying question of, "Why do individuals fail to report concussions?" This research could potentially be a stepping stone into discovering how we can minimize additional concussive injuries by shedding light into the reasons why they go unreported in the first place. My method of data collection is with a survey that is broken down into three different

sections. The first is inquiring if an individual has had an undiagnosed concussion and why they did not report it. The second is asking if they have seen a friend or anyone else express symptoms of a concussion and decided not to report it. The third is asking a general, overall opinion of what sport they believe gives a person the greatest risk for a concussion and why they would choose not to report it. With this information, we can then focus on solving the bigger problem, whether it's educating individuals on what a concussion is, the danger of playing with a concussion, or teaching medical staff to better recognize and assist with concussions. This project is in collaborations with Dr. Mani Campos of St. John's University/College of St. Benedict, and Dr. Nate Brever of Albany Clinic in Albany, Minnesota. My target age range is 7th grade and up as my research is broken down into middle school, high school, collegiate, and post-graduate categories. The data collected is completely anonymous and there will be a composite score for each school that has enough student/adult participants.

Sarah McLarnan, Connor Stark-Haws (Stephen Saupe, Biology) Rate of Photosynthesis in Cucumber Leaves of Varying Ages

Age has been found to affect photosynthetic rates in plants. This study seeks to measure the rate of photosynthesis in cucumber leaves of varying ages. Leaf position from the cotyledons was used to estimate leaf age. We predict that leaves at the fourth node will have a higher rate of photosynthesis than more immature (6th node) or older (2nd node) senescing leaves. A<sub>ci</sub> curves were generated from data collected using a LI6400 of leaves. Curves were analyzed to determine stomatal limitation, rubisco carboxylation and RuPB regeneration. Results will be presented.

Katee Meckeler (David Mitchell, Biology) Antibiotic Resistant Bacteria in Central Minnesota Lakes

The purpose of this study is to examine the occurrence and pattern of antibiotic resistance among bacteria found in lakes on the Saint John's University campus and in Avon, MN from summer 2015 to spring 2016. By analyzing the affect temperature has on the pattern of antibiotic resistant bacteria, the data will provide comprehensive information that is imperative to understand the characteristics and extent of antibiotic resistance. This study will support efforts to regulate antibiotic consumption and misuse by contributing data that shows the existence of antibiotic resistant bacteria in our local aquatic communities and how the fluctuating seasons play a role in this resistance pattern.

Brooke M. Piepenburg, Elizabeth M. Kurpiers (Carol Jansky, Biology) Factors Affecting Tree Swallow (*Tachycineta bicolor*) Nestling Resting Metabolic Rate

Metabolism is the major force that maintains the most rudimentary of functions, and, therefore, maintains life in every organism. Because of the immense effect metabolism can have on an individual's life history, it is key that the factors influencing metabolic rate are investigated. This study was designed to investigate the influential factors affecting Tree swallow, *Tachycineta bicolor*, nestling resting metabolic rates by observing maternal effects, early developmental conditions, age, and body mass in Tree swallow nestlings within collection sites at the Saint John's Abbey Arboretum and Kraemer Lake-Wildwood County Park in Stearns County, Minnesota. Due to the fact that there is little research on the resting metabolic rate of Tree swallows, this study contributes to the fields of ecology and organismal biology in allowing for greater knowledge on the resting metabolic rates of Tree swallows and, potentially, other small, short-lived animals. For this study, two predictions were made: the first being that the male Tree Swallow nestlings would have a higher resting metabolic rate than their female nestling counterparts. In the second prediction, it was anticipated that the resting metabolic rates of Tree Swallow nestlings from one nest box would differ significantly from the rates of nestlings within another nest box, as it was expected that their environmental influences would differ. After data analysis was completed, it was concluded that our first hypothesis, which states that males would have a higher resting metabolic rate than their female counterpart, was not supported, and that our second hypothesis that each nest box would have an average nestling resting metabolic rate different than the other nest boxes was supported.

Wendy M. Richards, Meghan N. Koenig (Stephen Saupe, Biology) Examining the Effect of Humidity on the Photosynthetic Rate of Gardens

The purpose of this study was to examine the effects that immediate changes in humidity have on the photosynthetic rate of garden bean plants, *Phaseolus vulgaris*. Previous studies have shown that humidity has a positive effect on the rate of photosynthesis (Rawson et al. 1977). We hypothesized that changes in humidity levels would directly effect the rate of at which a plant takes up CO<sub>2</sub>, and ultimately the rate of photosynthesis. Several replicates of *P. vulgaris* were grown in the Saint John's University greenhouse under fixed lighting with a relatively constant humidity. Photosynthetic rate was measured at varying levels of humidity with the LiCor 6400. Results and conclusions will be presented.

Vincent Thao, Max Carlin (Stephen Saupe, Biology) Comparing Photosynthetic Strategies of Different Conifers

The purpose of this experiment is to measure the photosynthetic attributes of four different coniferous tree species as a means of comparing the photosynthetic and evolutionary strategies of different taxa and needle shoot morphologies. Coniferous plant species display different shoot growth patterns, which may reflect the evolution of different photosynthetic strategies. Photosynthesis in white pine (*Pinus strobus*), red pine (*Pinus resinosa*), white cedar (*Thuja occidentalis*), and Eastern juniper (*Juniperus virginiana*) was measured with a LiCOR-6400. Results will be presented.

*Peter Engel Science Center 369, SJU*

### **Biology**

Karen Casillas, Maura Flynn, Paige Goodman, Danika Jackson, Jeanette Thornton (William Lamberts, Biology) Biological Illustration 2016 Class Exhibition

Students enrolled in Biological Illustration are introduced to the use of four different techniques or media—graphite pencil, pen and ink, colored pencil, and watercolor—that are commonly used for rendering biological illustrations. Each student completed at least one illustration using each of the four techniques. Several of these pieces are on display in this exhibition.

The students also learned how to scan their images and use software like Photoshop and Illustrator to manipulate and edit their illustrations. Each student worked on an individual project to produce illustrations that convey significant information about a topic. Samples of some of the projects are also on display.

*Quadrangle 170, SJU*

### **Political Science**

Grant Anderla (Christi Siver, Political Science) Why Does the U.S. Provide Official Development Assistance?

Why Does the U.S. Provide Official Development Assistance? Dr. Christi Siver's POLS 223 Comparative Politics class presents their research.

Nomin Angarag (Christi Siver, Political Science) Why do some developing countries that are resource rich develop differently than others?

Why do some developing countries that are resource rich develop differently than others? Dr. Christi Siver's POLS 223 Comparative Politics class presents their research.

Jesus Belmonte (Christi Siver, Political Science) Why do some Latin America countries fall into corruption while others do not?

Why do some Latin America countries fall into corruption while others do not? Dr. Christi Siver's POLS 223 Comparative Politics class presents their research.

Berhanu Bogale (Christi Siver, Political Science) Why do states seek to host international sporting events when they often lead to long term costs?

Why do states seek to host international sporting events when they often lead to long term costs? Dr. Christi Siver's POLS 223 Comparative Politics class presents their research.

Kaelyn Dabney (Christi Siver, Political Science) Why do large Communist countries politically develop so differently?

Why do large Communist countries politically develop so differently? Dr. Christi Siver's POLS 223 Comparative Politics class presents their research.

Olayemi Fadahunsi (Christi Siver, Political Science) What explains the variation in African states' levels of corruption?

What explains the variation in African states' levels of corruption? Dr. Christi Siver's POLS 223 Comparative Politics class presents their research.

Jaquelin Galindo (Christi Siver, Political Science) Why have countries struggled to eradicate drug trafficking? A case study on Mexico's drug trafficking industry.

Why have countries struggled to eradicate drug trafficking? A case study on Mexico's drug trafficking industry. Dr. Christi Siver's POLS 223 Comparative Politics class presents their research.

Kathryn Hockman (Christi Siver, Political Science) What are the causes behind the rise of authoritarian populist tendencies in political regimes today?

What are the causes behind the rise of authoritarian populist tendencies in political regimes today? Dr. Christi Siver's POLS 223 Comparative Politics class presents their research.

Tanner Johnson (Christi Siver, Political Science) Why do states continue to participate in NATO after the initial threat is gone?

Why do states continue to participate in NATO after the initial threat is gone? Dr. Christi Siver's POLS 223 Comparative Politics class presents their research.

Collin Joyce (Christi Siver, Political Science) Why do state actors explicitly include religion in written constitutions?

Why do state actors explicitly include religion in written constitutions? Dr. Christi Siver's POLS 223 Comparative Politics class presents their research.

Mitchell Lundquist (Christi Siver, Political Science) Why do African nations collaborate in climate change negotiations?

Why do African nations collaborate in climate change negotiations? Dr. Christi Siver's POLS 223 Comparative Politics class presents their research.

Mapy Mejia Florez (Christi Siver, Political Science) What factors cause democratization success in developing countries?

What factors cause democratization success in developing countries? Dr. Christi Siver's POLS 223 Comparative Politics class presents their research.

Karl Pearson (Christi Siver, Political Science) What factors explain variation in national healthcare systems?

What factors explain variation in national healthcare systems? Dr. Christi Siver's POLS 223 Comparative Politics class presents their research.

David Peterson (Christi Siver, Political Science) Why are some countries with diverse populations able to avoid internal conflict while others cannot?

Why are some countries with diverse populations able to avoid internal conflict while others cannot? Dr. Christi Siver's POLS 223 Comparative Politics class presents their research.

Nick Rethemeier (Christi Siver, Political Science) Why do some authoritarian states engage in civil war while others do not?

Why do some authoritarian states engage in civil war while others do not? Dr. Christi Siver's POLS 223 Comparative Politics class presents their research.

Natalie Roberts (Christi Siver, Political Science) What factors play a role in the variations of state recovery from civil war?

What factors play a role in the variations of state recovery from civil war? Dr. Christi Siver's POLS 223 Comparative Politics class presents their research.

Alejandro Salinas (Christi Siver, Political Science) What factors explain variation in the effectiveness of efforts to combat drug trafficking?

What factors explain variation in the effectiveness of efforts to combat drug trafficking? Dr. Christi Siver's POLS 223 Comparative Politics class presents their research.

Mary Catherine Steenberge (Christi Siver, Political Science) Why are some protests successful in achieving political gain?

Why are some protests successful in achieving political gain? Dr. Christi Siver's POLS 223 Comparative Politics class presents their research.

Sheng Yang (Christi Siver, Political Science) What factors explain variation in national immigration policies regarding marriage?

What factors explain variation in national immigration policies regarding marriage? Dr. Christi Siver's POLS 223 Comparative Politics class presents their research.

*Quadrangle 254, SJU*

### **Philosophy**

Jerly Alcala (Stephen Wagner, Philosophy) Philosophy Capstone presentation – Richard Rorty's Philosophy and the Mirror of Nature

Out with the Old and in with the New: Introducing Richard Rorty's Theories on Pragmatic Education

Richard Rorty's Pragmatic philosophy aims to encourage discourse that will advance and be helpful to society. Education plays a significant role in society and thus Rorty's pragmatism is applied at a primary and secondary level. In Rorty's utopia, a sense of national pride and societal molding will be used to create rule-abiding, proud citizens at the first level. In his secondary level of education, students will be taught to criticize and question the mold, so that they will advance their society in a positive manner. In my presentation I will explore the strengths and flaws in Rorty's Utopian Education. Perhaps it isn't as perfect, or practical as he thinks...



Stephen F. Bauer (Stephen Wagner, Philosophy) Philosophy Capstone presentation – Richard Rorty’s Philosophy and the Mirror of Nature

#### Richard Rorty, Confucianism, and Relativism

Rorty’s work has many parallels with Eastern philosophy. Both Richard Rorty and many Eastern schools of thought have been accused of endorsing relativism. I will examine how Rorty’s philosophy shares many themes with the school of Confucianism (and perhaps Taoism), and whether Rorty, Confucianism, or both are relativistic.

Alex M. Ingulsrud (Stephen Wagner, Philosophy) Philosophy Capstone presentation – Richard Rorty’s Philosophy and the Mirror of Nature

#### Richard Rorty and Pragmatism

Richard Rorty’s book, *Philosophy and the Mirror of Nature*, utilizes a pragmatist epistemology to undermine the traditional correspondence theory of truth. Pragmatism as a school is best defined by the adherence to the pragmatic maxim of Charles Sanders Peirce (1839-1914), but thinkers within the school also vary greatly. This presentation aims to clarify Rorty’s place within pragmatist thought, with a focus on comparing Peirce and Rorty’s conception of truth.

Daniel J. Langfeld (Stephen Wagner, Philosophy) Philosophy Capstone presentation – Richard Rorty’s Philosophy and the Mirror of Nature

#### Quine and Rorty

In my presentation, I will present the research I have found regarding Quine’s essay “Two Dogmas of Empiricism.” Specifically, I look at sources defeating the success of Quine’s attack on a priori Knowledge and the analytic/synthetic distinction. I then discuss Rorty’s use of Quine and explain whether I think he interprets Quine correctly. I argue that Rorty’s argument is premature, and I think there is more to be said on Quine before we accept Rorty’s use of his argument.

Braden P. McCormack (Stephen Wagner, Philosophy) Philosophy Capstone presentation – Richard Rorty’s Philosophy and the Mirror of Nature

#### Richard Rorty and the Myth of the Given

My presentation will cover Richard Rorty’s use of Wilfred Sellars’s “Empiricism and the Philosophy of Mind” and how Rorty was able to undermine Immanuel Kant’s concept-intuition distinction. This helps

Rorty to show that philosophy's supposedly perennial problems of epistemology are actually historical ones, and to steer philosophy from representationalism and foundationalism, to put it on a course of pragmatism.

Robert G. Otting-Crandall (Stephen Wagner, Philosophy) Philosophy Capstone presentation – Richard Rorty's Philosophy and the Mirror of Nature

The last few decades of philosophical inquiry has witnessed growth in the field of environmental thought. With recent developments in the understanding of environmental issues, a variety of theories have emerged to address ethical concerns for the environment. While these theories have helped the field of environmental ethics grow in recognition, many have speculated that many of the goals and foundations in these arguments have made it difficult for environmental ethics to influence action in the real world. In response to this, the field of environmental pragmatism has come forth as a philosophical discipline with the hopes of providing practical, socially focused answers to the growing concerns for the environment. This paper will explore environmental pragmatism as a valuable development for environmental ethics, focusing in particular on the arguments of pragmatist philosopher John Dewey and neopragmatist philosopher Richard Rorty. While both offer helpful insight to environmental ethics and greater philosophical concerns, this paper will ultimately show where the two differ and argue that Dewey's pragmatism offers the best answer for environmental ethics.

Mone'Kai K. Shannon-Thornton (Stephen Wagner, Philosophy) Philosophy Capstone presentation – Richard Rorty's Philosophy and the Mirror of Nature

#### Richard Rorty and Feminism

The purpose of this academic research paper is to explore Richard Rorty's relationship with feminist philosophers. Its other purpose is to analyze Rorty's attempt to use Pragmatic language instead of Universalist and realist language as a means to address "real world" epistemic problems that directly affect marginalized groups such as women, minorities, etc. However, for the sake of clarity, this paper will focus on women.

*Quadrangle 344, SJU*

#### **Communication**

Emily Doyle (Jeanmarie Cook, Communication) Getting the Joke: Women and Humor in the United States

In recent history, more female comedians have been emerging and making names for themselves in the U.S. entertainment industry. A commonly voiced opinion is that women just aren't as funny as men; with that in mind, one must ask how and why women have increasingly used humor to make their voices heard. By examining the social function of humor in the United States, how humor is used to emphasize power differences, and the unique obstacles faced by women seeking to express themselves through humor, this research focuses on common themes in women's distinct approach to humor and how it has been used to pursue social change.

Haley Ehleringer (Jeanmarie Cook, Communication) Reclaiming the Divine Feminine

In this project I examine the language used in our expressions of the Divine. I argue that creating a space in religious language for the wholeness of humanity to find a place is essential to the spiritual flourishing of all those whom have been underrepresented by it. I look at the language depicting God in the Hebrew Bible as well as in the gospel, life, and ministry of Jesus. I then reflect on the implications of the language used in the church and presented an argument for more creativity and diversity in our religious language in the hopes that we would benefit from a more spiritually dynamic depiction of God.

Emily Krych (Jeanmarie Cook, Communication) The Objectification of Women and its Far-Reaching Effects

The objectification of women in the media is a prominent issue within our society. Women's bodies in U.S. culture are constantly being evaluated and objectified by themselves and by others. My presentation will address how media images in our society result in the sexual objectification of women through objectifying language and images. In addition, I will explain how these factors have the potential to result in the negative outcomes of sexism, self-objectification, dehumanization, and damaging influences in romantic relationships. This is an important issue to address because the media within our society chooses to continually portray women in ways that allows only their bodies to represent them, rather than their individuality.

Lydia Ogren (Jeanmarie Cook, Communication) How The Media Shapes Gender in the U.S. American Culture

Boys and girls are socialized into different roles, which then shape their outlooks of life and other people's expectations of them. One of the biggest influences on forming stereotypical gender roles is the media. I argue that it is through media language, imagery, and marketing

techniques that children learn how they are supposed to act according to their sex, as well as what their gender identity should be, thus shaping the U.S. American culture.

*Stephen B. Humphrey 028 (choir room), SJU*

## **Music**

Rene Cabrera, Grace Cardinal, Ted Christian, Danyal Dawson, Zachary Dietz, Maria Frie, Hannah Glynn, Shanna Grambart, Tanner Johnson, Cameron Jurek, Yan Kang, Grant Kaufman, Jonathan Kleist, Matthew Mertens, Rebecca Moy, Elizabeth Pritchard, Huba Sekesi, Patrick Strey, Natasha Stubeda, Zackary Sundly, Sean Surbaugh, Marissa Swegle, Hunter Thompson, Yijiao Tian, Daniel Tripicchio, John Wells (Amy Grinsteiner, Music) A Music Exploration

Music through History students will analyze the music elements of songs from various genres and communicate their findings through interactive dialogue and listening sessions with attendees.

Specific genres of music to be presented: Roots of Reggae, Cinematic Battle Scenes, Famous Guitar Riffs, House Music from Around the World, Lost in Paradise, Road Trip through the 70s, Vietnam War Protest Songs, Country Controversy and Pre-Depression Jazz.

## Fine Arts Presentations:

### Art

#### Schedule

*10:30 - 11:00 AM*

*Art Gallery*

Tianning Zhang (Carol Brash, Art) College of St. Benedict's Seated Buddha

#### Abstracts

**Zhang:** In the permanent art collection at the College of Saint Benedict, I found a gilded clay seated Buddha which was dated to the Liao dynasty (907–1125). My research is concerning this seated Buddha to place into a context with Buddhist arts from the same time period and to determine the iconography, date, production technique, usage, and patrons, if possible. My presentation will share my research to date and will also introduce the Buddhist practice of Northern China in the middle ages and its interaction with other religions and political entities.

### Music

#### Schedule

*11:00 - 11:45 AM*

*SBH 015*

Alexander Seefeldt (Brian Campbell, Music) Ojczy: the Theology of a Choral Composition

#### Abstracts

**Seefeldt:** Ojczy, a thirteen-minute a cappella choral composition in Polish, is my longest and most ambitious work to date. The texts for its three movements are drawn from the three occasions during Christ's Passion on which He addresses His Father. In this presentation, I will address the various theological and expressive concepts that I aimed to convey in the piece. Major themes include Jesus' human and divine nature, His relationship with the Father, and His mercy.

## Humanities Presentations:

### Communication

#### Schedule

*10:00 - 10:30 AM*

*Quad 346*

Marc Mack, Georgia LaLuzerne, Afton Windsperger (Karyl Daughters, Communication) Traditional Heteronormativity in the Millennial Generation

*10:40 - 11:00 AM*

*Quad 346*

Pa Thao, Alexa J. Erickson, Kara B. Schoenherr, Charles C. O'Dell (Jennifer Kramer, Communication) Health Beliefs, Practices and Experiences at CSB/SJU

*10:50 - 11:05 AM*

*Quad 344*

Shelby S. Groen (Karyl Daughters, Communication) Let's Move! Campaign: Social Discourse and Family Communication

*11:05 - 11:25 AM*

*Quad 344*

Emily Doyle, Emily Krych, Mary Kate Ludick (Karyl Daughters, Communication) Origins and Perceptions of the Wicked Stepmother Stereotype

*11:05 - 11:25 AM*

*Quad 346*

Miranda L. Olson, Hannah M. Gerdes, Bao Khang, Groves E. Abby, Malia E. Carson (Jennifer Kramer, Communication) CSB/SJU's Adaptation to Intercultural & International Students' Health Beliefs and Practices

*11:30 - 11:40 AM*

*Quad 344*

Theodore P. Johnson (Aric Putnam, Communication) Rhetoric of Cultural Appropriation

*11:40 - 11:50 AM*

*Quad 344*

Andrew Doig (Aric Putnam, Communication) Rhetoric & Music: Persuasive Tools in Advertising

*11:40 - 12:00 PM*

*Quad 346*

Blanca E. Dominguez, Brenna E. Pierskalla, Lawanza D. Montgomery, Afton R. Windsperger (Karyl Daughters, Communication) #Iloveyou: Perceptions of the locution "I love you" via text and social media

11:50 - 12:00 PM

Quad 344

Shannon Murphy (Emily Paup, Communication)  
Elizabeth Ann Seton: A Trailblazer, Saint & Women's  
Voice

## Abstracts

**Mack, LaLuzerne, Windsperger:** Heteronormativity is defined as the belief that gender is only binary (male and female) and these genders have natural and specific gender roles to follow. Two studies were conducted at the College of St. Benedict and St. John's University by a section of COMM 351, Gender & Communication, in the fall semester of 2015. First, an observational study was conducted between the campuses where student's comments and behaviors, which remained anonymous, were coded into various categories for later analysis. The second study was a self-report survey inquiring about the extent to which students agreed, or disagreed, with statements of gender and/or sexuality and whether or not they had experienced sexual or gender-related harassment. In the latter study, we introduced a Social Desirability Scale to ensure that students were answering honestly with no contradictions in their answers. Our general results showed that our campuses supported trends observed in the millennial generation while still holding onto some heterosexual social norms. Theories for this dichotomy of progressive and traditional thoughts on sexuality are explored. This research was conducted as part of the Quality Initiative Project at CSB/SJU.

**Thao, Erickson, Schoenherr, O'Dell:** This study is designed to build off of the results from last year's COMM 353 (Capstone: Intercultural Health Communication) research project by trying to better understand CSB/SJU international and intercultural students' health beliefs and practices, particularly as they occur at CSB/SJU. We interviewed nine students to get a deeper understanding of their health practices and will report on the major themes from those interviews.

**Groen:** The Let's Move! campaign seeks to lower children and adolescent obesity rates by implementing healthier food choices and exercise programming in schools and businesses across the nation. In applying communication concepts such as the systems approach, relational dialectics, and analyzing familial roles and conflict it is argued that the Let's Move! Campaign, working as a social discourse, promotes nutritional communication in families.

**Doyle, Krych, Ludick:** The stereotypes formed by Disney have negative effects on family communication and shape society's perceptions of stepparents. Social discourse under the influence of Disney stereotypes about stepparents, including news and talk shows, sabotages actual stepmother-child relationships. This presentation will address how communication around the issue regarding Disney's tradition of portraying stepmothers as evil should be discussed in families with young children who are viewing such movies.

**Olson, Gerdes, Khang, Abby, Carson:** This study is designed to build off of the results from last year's COMM 353 (Capstone: Intercultural Health Communication) research project by examining how CSB/SJU adapts to intercultural and international students' non-biomedical health beliefs and practices. Six CSB/SJU administrators were interviewed. Our presentation will explore the major themes from those interviews.

**Johnson:** The objective of this paper will be to identify the irony in the fact that Macklemore has written a song about white privilege. Not only is it ironic due to him delivering this style of rhetoric while being white but it is made even more ironic that he is spreading this message through a medium created by and primarily performed by members of the African American community. It will examine Macklemore's rhetoric through the lens of white privilege and examine the inconsistencies with the message.

**Doig:** I will be discussing Chrysler's 2014 Super Bowl ad "America's Import," focusing on Chrysler's use of rhetoric and music as a way to connect to the audience in order to sell their product. I will delve into several theories supporting Chrysler's reasoning behind the creation of this ad.

**Dominguez, Pierskalla, Montgomery, Windsperger:** Students in COMM368: Love, Sex, and Commitment conducted research looking at the role of technology on shaping the meaning of the locution "I love you." Specifically, the study explored the meaning of the expression of "I love you" in three mediums (face-to-face, text messaging, and Facebook public post) and in two different contexts (the first time expression and subsequent expressions). Results indicate clear differences in perceptions of genuineness, confessor honesty, relational commitment, and relational satisfaction across the three communication channels. Motivations for choosing mediated communication for the expression "I love you" and gender differences are also explored.

**Murphy:** A convert to Catholicism, Elizabeth Ann Seton was the first American-born saint who made an impact on the education system and religious life in the United States. She set the foundation for future students and religious sisters by creating a Catholic school for girls and founding the Sisters of Charity. Seton was a trailblazer despite much loss, strife and challenge during her life. Scholars have considered Seton as a mother and committed to her faith, which can be reflected in her title Mother Seton and achieving sainthood. Her letters, journals and historical writings serve as further evidence of her humility, piety, and anchored spirit, which carried her throughout life and to achieve beyond what women were considered capable of. This project looks to highlight her life and rhetoric that led to her achievement and legacy. It was a part of a series of archival projects to uncover lost and forgotten women's voices throughout history as part of the class Women's Voices.



## English

### Schedule

<i>10:30 - 10:35 AM</i> <i>Quad 347</i>	Nicholas Burke (Rachel Marston, English) Greek Therapy
<i>10:35 - 10:40 AM</i> <i>Quad 347</i>	Lisa Xiong (Rachel Marston, English) Park Taejoon
<i>10:40 - 10:45 AM</i> <i>Quad 347</i>	Megan M. Toninato (Rachel Marston, English) Rose
<i>10:45 - 10:50 AM</i> <i>Quad 347</i>	Taylor Hedin (Rachel Marston, English) Joseph
<i>10:50 - 10:55 AM</i> <i>Quad 347</i>	Aaron Fiedler (Rachel Marston, English) Astral Eyes
<i>10:55 - 11:00 AM</i> <i>Quad 347</i>	Ryan McCanna (Rachel Marston, English) Projection
<i>11:00 - 11:05 AM</i> <i>Quad 347</i>	Nicholas Smoger (Rachel Marston, English) The Funeral
<i>11:05 - 11:10 AM</i> <i>Quad 347</i>	Vanessa Caldera (Rachel Marston, English) It's a Boy Who Needs a Wife
<i>11:10 - 11:15 AM</i> <i>Quad 347</i>	Jonathan H. Meidl (Rachel Marston, English) Professors and Educators
<i>11:15 - 11:20 AM</i> <i>Quad 347</i>	Olivia M. Zajac (Rachel Marston, English) Colored
<i>11:20 - 11:25 AM</i> <i>Quad 347</i>	Jose W. Alvarez (Rachel Marston, English) Great Owl
<i>11:25 - 11:30 AM</i> <i>Quad 347</i>	Halie Nettleton (Rachel Marston, English) The Answer
<i>11:30 - 11:35 AM</i>	

*Quad 347*

Christopher Beeth (Rachel Marston, English) An Expensive Turkey Sandwich

*11:35 - 11:40 AM*

*Quad 347*

Johanna Jutz (Rachel Marston, English) A Caprine Conversation

*11:40 - 11:45 AM*

*Quad 347*

Connor Pedersen (Rachel Marston, English) Sentinel

## **Abstracts**

**Burke:** Legendary figures from Greek mythology gather in a small Alabama conference room for a group therapy session about their various "transformative" experiences.

**Xiong:** Great. Just Great. You have a big date tonight but there's a pimple on your forehead. What do you do to get rid of it before your date shows? No worries, RealSkin is the perfect product for you.

**Toninato:** A tragic short story told through the eyes of a kindergartener. When Rose discovers her best friend, Tommy, is absent from school, she begins to question why.

**Hedin:** A girl reminisces on the life of her older brother, Joseph, who grows up then regenerates back to an infant until his death. Through flashbacks and the present moment, she prepares herself for a life without Joseph through happy memories of their past together, and the grief of the future.

**Fiedler:** This story navigates a man's relationship from the beginning to the inevitable end. The man recounts the memories before he proposes and is given conditional yes. He cannot meet the condition but instead of sulking he accepts the sad reality of the moment and thanks her for helping make him a better man.

**McCanna:** In this world, unborn babies can be screened in order to reveal their personality as reflected in the shape of an animal. Casey is excited to be an aunt and she is determined to decipher the Fauna of her sister's unborn child.

**Smoger:** This story follows a young man coping with the abrupt death of his uncle. In the immediate aftermath, he meditates on their relationship, but struggles to understand who his uncle was and what his death represents.

**Caldera:** A reading on a story about a just born infant boy and his parents need to find him a wife. There are policies and deadlines to the picking of the wife.

**Meidl:** A look into the mind of a cynical 7th grade teacher as he goes through the stale motions with his class. He reflects upon his long-abandoned aspirations in light of his apathetic students and their lackluster performance in his class.

**Zajac:** "Colored" takes place in a world where a person's skin changes color based on their past wrongdoings. Several different characters present their stories as they cope with the changes.

**Alvarez:** A face paced and exciting short story about the secret mission of Agent Terasova traveling back to her homeland in order to uncover the secret plans of the mysterious and infamous Intelligence Drone Syndicate (IDS). In her attempt to learn more about the plans of IDS she runs into trouble, which brings her face to face with her worst nightmare.

**Nettleton:** The Answer is a short work of fiction that deals with the struggles of faith, love, and gender identity. The story follows Astrald, a young transgender man who is given a vision by the goddess Tol. To find the answers he seeks, he must embark on a journey to find an ancient monument and discover where he truly belongs.

**Beeth:** I will be reading a short story I wrote titled "An Expensive Turkey Sandwich." The story follows the drunken misadventure of a college student attempting to find his roommate.

**Jutz:** "A Caprine Conversation" enters the fabulist companionship between Julia and her talking goat, Walnut. Julia struggles with her personal life, Walnut is in labor, and they share a bond that is challenged as tensions are birthed in the relationship. This story blends fabulism with everyday rural life and was constructed for the Advanced Creative Writing: Fiction course.

**Pedersen:** A boy is left alone in his house, suffering from a heavy fever as he waits for his two sisters to come home, supposedly. In his addled state he wanders the house and dredges up memories of the past few months, of a family being torn apart between two people who are trying their best.

## History

### Schedule

*9:00 - 9:30 AM*

*Main*

*Boardroom/Fireside*

Kaila M. Forster (Shannon Smith, History) "The Political She of Georgia": Rebecca Latimer Felton, Gendered White Supremacy, and Convict Leasing

*9:00 - 9:30 AM*

<i>Main Boardroom/Fireside</i>	Caitlin Lieser (Shannon Smith, History) Familial Influence: How a Southern Family Hindered the President from Emancipating His Slaves
<i>9:30 - 10:00 AM Main Boardroom/Fireside</i>	Kristine Wasik (Shannon Smith, History) How Abraham Lincoln's Depression Fueled the Election of 1864
<i>9:30 - 10:00 AM Main Boardroom/Fireside</i>	Lukas F. Belflower (Shannon Smith, History) 'Secret Animosity': Afro-American Mobility and Pro-Colonization Rhetoric in the Upper South
<i>10:30 - 11:00 AM Main Boardroom/Fireside</i>	Sarah B. Weber (Shannon Smith, History) Alexander Solzhenitsyn's Impact on Soviet Memory of the Gulag
<i>11:00 - 11:30 AM Main Boardroom</i>	April Bondhus (Shannon Smith, History) Masculinity in the Vietnam War: The Father/Son Dichotomy

## Abstracts

**Forster:** The convict lease system—the practice of leasing convicts to industrial industries—became a widely used system in southern states after the American Civil War. This system was a reaction to economic fears of labor shortage, a desire to modernize, as well as a way for white southerners to reclaim their supremacy through violence and forced labor. Rebecca Latimer Felton, a prosperous and educated Georgia society woman, advocated for the end of convict leasing by creating arguments based on morality and gender. By using her white femininity, Felton's discourse aided in the separation of men and women convicts for the purpose of benefiting white women.

**Lieser:** George Washington has been celebrated as the hero of the American Revolution, however he was not the hero of the emancipation of slavery as many abolitionists of the Northern states thought he would be following the war. George Washington remained a slave owner throughout his life, even though it is clear from letters that he had written to others that he faced a moral objection to the institution. Washington freed his slaves in his will, but was held back from giving them their freedom prior to his death because he was influenced by his family not to release them as they were engrained into the Southern slave society who depended on the labor that slaves produced.

**Wasik:** Historians have argued that tragic events that Abraham Lincoln experienced in his childhood caused him to suffer from depression as a young

boy. In what ways did this lasting depression, or melancholy as it was commonly known in the 1860s, actually affect Lincoln's presidency? More specifically, how did it affect Lincoln in his decision to run for reelection in 1864? This paper argues that public perception of his character and his mental and physical appearance, as well as the influence of depression on his political decisions made during the war, actually fueled him to run for reelection in 1864.

**Belflower:** This essay attempts to use an Atlantic context to analyze the motivations of white southerners in the United States who supported the colonization of free African Americans in the early nineteenth century. Instead of focusing solely on incidents that occurred in America for contextual evidence, I mainly focus on events that occurred outside the nation's borders. These include the Haitian and American Revolutions, as well as emancipation in the British West Indies. Many arguments have been proposed as to what may have motivated these people. Some scholars even insist that multiple factors were incredibly important. My argument, on the other hand, takes the perspective of the African Americans. I argue that their ability to communicate with one another through the transmission of rumor frightened white southerners enough to be the predominant motivating factor in supporting a colonization movement.

**Weber:** While it is easy for any country to be selective about its past marveling and glorify its achievements, it has been especially difficult for Russians to come to terms with their history as a whole, particularly in regard to the Gulag camp system. The Gulag was a forced labor system instituted by the government and responsible for over eighteen million prisoners from the 1920s until the demise of the Soviet Union. While the intent of Soviet camps was not extermination like the Nazi concentration camps, the Soviet camps were arguably equally horrendous in nature. Through the years, public discourse around the Gulag has been extremely suppressed, especially during the Soviet era, but not absent. I argue Alexander Solzhenitsyn, a former camp prisoner turned literary sensation, became the driving force behind the existing public discourse surrounding the Gulag and its memory prior to the collapse of the Soviet Union, specifically in the novel *One Day in the Life of Ivan Denisovich* and *The Gulag Archipelago*.

**Bondhus:** Some have stated that the Vietnam War was a crisis of masculinity. Rather than a crisis, I believe the Vietnam War represents a turning point in masculinity, one where the old ideals of masculinity seemed to have failed soldiers and forced them to question what had previously been unquestionable. Many soldiers went to Vietnam to achieve their manhood as their fathers had done in World War II, and when they were told they had not done so, they were left with a feeling of failure and discomfort with the ideas of masculinity that had caused them to join in the first place.

## Languages & Cultures

### Schedule

- 10:00 - 10:20 AM*  
*HAB 101* Michael Macken (Scott Richardson, Languages & Cultures) Individual Struggle in Vergil's Aeneid
- 10:00 - 10:10 AM*  
*HAB 117* Andrew D. Berg (Limei Danzeisen, Languages & Cultures) Chinese Military
- 10:10 - 10:20 AM*  
*HAB 117* Misee A. Yang (Limei Danzeisen, Languages & Cultures) Famous Chinese Dishes in China
- 10:20 - 10:30 AM*  
*HAB 117* Jordyn O. Potter (Limei Danzeisen, Languages & Cultures) Chinese shadow puppet theater
- 10:20 - 10:40 AM*  
*HAB 119* Mitchell Konkell (Wendy Sterba, Languages & Cultures) The German Energiewende: Using Germany as a Model for a Renewable Energy Transition
- 10:30 - 10:50 AM*  
*HAB 118* Marina Bousckri (Camilla Krone, Languages & Cultures) Le japonisme and Pierre Loti
- 10:40 - 11:00 AM*  
*HAB 119* Karen Mize (Wendy Sterba, Languages & Cultures) Macht, Musik, und Misogynie: Die Frauen von Mozarts „Die Zauberflöte“
- 10:40 - 10:50 AM*  
*HAB 117* Mai Chaw Lee (Limei Danzeisen, Languages & Cultures) The Hmong Cinderella
- 11:00 - 11:20 AM*  
*HAB 119* Benjamin C. Kollaja (Andreas Kiryakakis, Languages & Cultures) Fission of a Scientist: An Approach to Handling Scientific Responsibility
- 11:00 - 11:10 AM*  
*HAB 117* Jacob B. Schneider (Limei Danzeisen, Languages & Cultures) Top cities to visit in China
- 11:10 - 11:20 AM*

*HAB 117* Jonathon M. Carlson (Limei Danzeisen, Languages & Cultures) The differences between schools in China & the U.S.

*11:20 - 11:30 AM*  
*HAB 117* Blake R. Maslonkowski (Limei Danzeisen, Languages & Cultures) Chinese Dynasties

*11:30 - 11:40 AM*  
*HAB 117* Sade C. Lockhart-Bain (Limei Danzeisen, Languages & Cultures) Chinese 112

## **Abstracts**

**Macken:** This thesis primarily focuses on Book IV of the Aeneid, where the ill-fated love affair between queen Dido and Aeneas takes place. I study how these characters struggle to maintain control of their lives in the face of the machinations of the gods and the volatility of their own emotions. I also pin down exactly what role the gods play in manipulating their emotions. While Dido finds herself helplessly in love with Aeneas despite devotion to her husband and people, Aeneas is adrift without the guidance of his recently deceased father, Anchises. While Aeneas's loss of purpose is restored by divine command, setting him up for his conquest of Italy, Dido is left behind without any hope for redemption.

**Berg:** Chinese military: traditions, customs, history, dynasties, technology, weapons, current day and compared to U.S. military.

**Yang:** This presentation will be on the famous Chinese dishes in China in order to know the Chinese culture and seek more knowledge about the food.

**Potter:** Chinese Shadow Puppet theater has been an important part of the culture since ancient times. Many historians believe it to be a way to also analyze the values and ideal morals of their fairytales.

**Konkel:** Germany is in an excellent position to be a model for other countries trying to implement a comprehensive energy transition. It has become the testing ground for many new policy measures and technological developments making it the ideal country for other nations to learn from as the need for renewable energies grows worldwide. In this paper, the German feed-in tariff is examined through a literature review and is used as an example of one of the strategies to fund an energy transition. It is necessary for Germany to minimize certain potential barriers to the transition. These barriers can be economic, social, and political. A comparison of Germany with Spain and Denmark, two countries that have also implemented feed-in tariffs, shows how the different policies and

situations can shape a renewable energy transition. Lessons from the German experience are drawn from the comparisons to the other countries.

**Bousckri:** In my project, I study orientalism as it is specific to Japanese culture, "le japonisme" in French. In considering the representation of Japanese culture in Pierre Loti's 19th century essay "Madame Chrysanthème," I focus on how Loti, as a Westerner, presents Japan to his largely French audience. My study incorporates Edward Said's theory of orientalism. I also consider a critique of Loti's work by a contemporary Japanese author Ryūnosuke Akutagawa.

**Mize:** Mozart's most beloved opera "The Magic Flute" was written in a time rife with turmoil. Titans clashed across Europe and at the time of the opera's premier in Vienna the average Austro-Hungarian citizen was still feeling the effects of the death of its own titan, Empress Maria Theresa. Her reign was divisive for many reasons, but most of all because she was a woman holding powers previously only held by a man. This presentation compares the narrative portrayals of women holding power in "The Magic Flute", with other fictional strong women such as the title character in Heinrich von Kleist's "Penthesilea", and Mademoiselle Renatchen Freundlach and Hortensia in Jakob Michael Reinhold Lenz's "Zerbin" and demonstrates a conservative trend of wanting to put women back in their proper place by showing how these characters were punished for using that power. This literary device will be shown to be a method to reinforce the preexisting male dominated social hierarchy, by turning overt misogyny into entertainment.

**Lee:** The Hmong ethnicity originates from China, or now known as the Miao ethnicity. Clothing, language, traditions and food play an important part in the Hmong/Miao culture in the past and present. Because Cinderella is also a love story, and touches upon agriculture and daily life of the Hmong/Miao people. And because Cinderella is a popular story and told in multiple versions, I want to translate parts of Cinderella into Chinese. In the Hmong version of Cinderella, a big and highly celebrated event takes place; the Hmong New Year, where many families come together to mingle, singles come to find companionship-maybe even marriage and hard work is showcased. When translating, I will relate Cinderella back to the Miao ethnicity in China today.

**Kollaja:** The responsibility of a scientist for the consequences of his or her own discoveries has been discussed at length by numerous German-speaking authors, playwrights, and scientists. Placing the responsibility for the unpredictable outcomes of scientific research on a single scientist or group of researchers is an unrealistic approach because it will inevitably lead to self-censorship and a loss of communication, on which science relies heavily. Instead, the responsibility lies with the scientific community to communicate the risks and benefits of a novel technology to supervisors and policymakers, so that they may make informed decisions about the application of science. I will examine this



responsibility through case studies such as the scientists of the German Uranverein and Manhattan Project.

**Schneider:** There are many great cities in China, but the best ones to visit are Beijing, Shanghai, Xi'an, Guilin, and Hong Kong. Each of these cities are beautiful and unique in their own way.

**Carlson:** 1) Discuss the differences and similarities between the Chinese and the American education system, such as general differences, differences in classes, and the application process for further education (Gao KAO).

2) discuss the similarities between the two and how even with the differences it is still pretty similar.

**Maslonkowski:** The history about the last three dynasties of China, from 1271-1911.

**Lockhart-Bain:** On the national symbols of China.

## Theology

### Schedule

*8:30 - 11:30 AM*  
*Gorec 204 B&C*

Mike C. Balko, Ruth E. Becker, Meghan R. Blaine, Zachary A. Bookey, Thomas J. Conlin, Tyler J. Dick, Leah M. Ellman, Mary C. Esker, Morgan L. Espelien, Phil A. Evans, Maria J. Galvez, Kaylee J. Garcia, Maddie E. Hulcher, Nicole M. Jaeger, Preston L. Joffer, Maddie J. Mack, Peyton K. Meade, Kacee C. Medved, Rebekah J. Meschke, Maranda K. Miller, Cassandra R. Rauschendorfer, Nic D. Schmit, Trisha M. Steinter, Denny Wasson, Ashley M. Wilson (Jeffrey Kaster, Theology) Festival of Faith

### Abstracts

**Balko, Becker, Blaine, Bookey, Conlin, Dick, Ellman, Esker, Espelien, Evans, Galvez, Garcia, Hulcher, Jaeger, Joffer, Mack, Meade, Medved, Meschke, Miller, Rauschendorfer, Schmit, Steinter, Wasson, Wilson:** Listen as students from the Youth Ministry theology class share inspiring testimonies of faith.

## Natural Sciences Presentations:

### Biology

#### Schedule

*10:30 - 10:50 AM*

*PEngl 373*

Jeffry J. Anderson (Robert Page, Biology) Genetic Resource Development in a Terrestrial Salamander

*10:30 - 10:50 AM*

*PEngl 375*

James T. Pathoulas, Chelsae M. Khadoo (David Brown, Kristina Timmerman, Biology) Characterization of Bromeliads on San Salvador Island, Bahamas

*10:50 - 11:10 AM*

*PEngl 373*

Alexis Loven, Catherine Jarocki (Katherine Smith, Biology) Non-Genetic Cause of Bipolar Disorder

*10:50 - 11:10 AM*

*PEngl 375*

Toni R. Gohman, Emily K. Kiolbasa, Sierra G. Lammi (David Brown, Biology) Exotic earthworms grow faster when eating leaves from exotic plants.

*11:10 - 11:30 AM*

*PEngl 375*

Jessica Lindemyer, Katee Meckeler (David Brown, Biology) Salinity Concentration and Phenotypic Variance in Leaf Shape of *Borrichia arborescens* in Coastal and Hypersaline Environments

*11:10 - 11:30 AM*

*PEngl 373*

James T. Pathoulas, Joseph A. Pathoulas, Nicholas M. Pathoulas, Christopher L. Pathoulas (Katherine Smith, Biology) Pegging Down Ovarian Cancer

*11:30 - 11:50 AM*

*PEngl 375*

Meghan N. Koenig, Kenea M. Andrews, Taylor D. Joy (David Brown, Kristina Timmerman, Biology)  
COLONIZATION PATTERNS IN UNINHABITED  
CONCH SHELLS PLACED IN DIFFERENT  
MARINE ENVIRONMENTS

#### Abstracts

**Anderson:** The red-backed salamander (*Plethodon cinereus*) is an important model organism in ecology, evolution, and behavioral ecology. Despite this, to

date there are only a limited number of genetic resources available to researchers working on red-backed salamanders. In this research endeavor, I mined a 0.11 Gb shot-gun genomic sequence library for potentially amplifiable loci (PALs) containing simple sequence repeats. I then characterized the resulting PALs and screened the most promising loci in populations beginning with the source population and extending over much of the salamander's range. The successful loci were then characterized and used to generate population level indices and assess the degree of differentiation between populations. The polymorphic loci identified will enhance researchers' ability to study this organism throughout its wide geographic range.

**Pathoulas, Khadoo:** Epiphytes are plants that prefer soilless substrate, including trees and rocks. *Tillandsia utriculata*, a bromeliad, is an epiphytic plant species common to Mexico and The Caribbean. Bromeliads have shallow roots making water acquisition challenging during seasonal dry periods. We visited San Salvador Island, Bahamas, in March 2016 at the end of the dry season. During our time on the island we studied this species in an effort to address two questions: 1) Does substrate type influence success of mature bromeliads? 2) Is the success of epiphytic bromeliad pups (seedlings) dependent on the host tree species? We used transect samples to select bromeliads and assess their status with a novel plant health index. Observations of mature bromeliads revealed that they fare better on trees than on rocks. Studies of bromeliad pups indicated certain tree species were favored as substrate while tree species with perpetually shedding bark were avoided.

**Loven, Jarocki:** "What is the non-genetic cause of Bipolar Disorder?" A novel and innovative hypothesis will be presented, as well as methods for testing this hypothesis. The impact of this hypothesis on diagnosis, research and treatment will also be discussed. This information was presented at the 2016 Mayo Clinic IMPACT symposium on March 5 as an entry into the research competition.

**Gohman, Kiolbasa, Lammi:** Introduction of exotic species can alter the functioning and species composition of ecosystems. European buckthorn (*Rhamnus cathartica*) and Tatarian honeysuckle (*Lonicera tatarica*) are introduced woody plants in Minnesota forests that suppress the growth of several native plant species and alter nutrient cycles. European earthworms, such as the night crawler (*Lumbricus terrestris*), have also been linked to modified nutrient cycles and reduced abundance of native forest plants and birds. In addition, these introduced plants and earthworms may have mutually facilitative effects, with earthworms improving the chance of seed germination and plants depositing highly palatable litter. We collected leaves (summer) and leaf litter (autumn) from 14 common trees and shrubs found in the Saint John's Abbey Arboretum, including exotic buckthorn and honeysuckle. We fed these leaves or litter to night crawlers and assessed their nutritional quality by estimating the growth rate of earthworms fed each litter type. Earthworms fed litter from exotic species grew significantly faster than those fed leaves of native species; honeysuckle

produced the highest growth rates among the summer leaves, while buckthorn did so among the autumn litter. Leaves and litter from common native trees such as white oak, red maple, or sugar maple generated slow earthworm growth. No significant correlation existed between the growth rates produced by summer leaves and those produced by autumn litter. Our results suggested that removal of exotic shrubs may deprive exotic earthworms of a high-quality food resource, and that some native tree species might suppress the growth of exotic earthworms.

**Lindemyer, Meckeler:** *Borrchia arborescens*, or Bay Marigold, is a common compact shrub with succulent leaves that can be found throughout the Bahamas and southern Florida. On the Bahamian island of San Salvador, *B. arborescens* grows on beaches, headlands, and along hypersaline lakes. These habitats differ in their soils and exposure to wind and salt spray. To examine the physical and physiological differences in leaves from each site, we measured leaf diameter, the presence of hairs, and the concentration of sequestered salt. We hypothesized that fleshy leaves from *B. arborescens* located on the outskirts of hypersaline lakes would store more salt than fleshy leaves of *B. arborescens* located on the oceanic coast because they are exposed to an environment with higher salt concentration. Our data suggested that there wasn't a significant difference in salinity concentration of fleshy leaves between the two different locations. There seems to be a maximum amount of salt that can be stored in *B. arborescens* fleshy leaves, which was exhibited mostly in fleshy leaves of *B. arborescens* growing along hypersaline lakes. When collecting samples, we observed that the leaves from *B. arborescens* growing along the oceanic coast were producing hairs on a large majority of their leaves with the exception of young immature leaves located at the base of the plants. In contrast, leaves from *B. arborescens* growing along the shoreline of hypersaline lakes produced no hairs on any of their leaves. It is probable that the production of hair on the leaves are associated more closely with environmental wind factors rather than salinity of the environment.

**Pathoulas, Pathoulas, Pathoulas, Pathoulas:** Despite intense research, ovarian cancer has a 70% mortality rate. The Center for Regenerative Medicine at The Mayo Clinic hosted a competition for undergraduates to develop a novel hypothesis for the cause of ovarian cancer. A team of brothers from CSBSJU developed the winning hypothesis: Exposure of estrogen, and its metabolites, to progenitor peg cells of the fimbriae can lead to chromatin structural changes and mutagen exposure causing sporadic fallopian tube epithelial transformation to ovarian cancer.

**Koenig, Andrews, Joy:** In aquatic ecosystems, fish and other organisms use different means for protection and shelter. In the Bahamas, the Queen Conch (*Strombus gigas*) is a delicacy, therefore, the animal is heavily sought after by locals. Afterwards, the shells are usually thrown back into the ocean or clustered around on the surrounding areas. The purpose of this study was to see how many fish would colonize or take shelter in the uninhabited conch shells. This study

was designed to determine whether the greatest fish colonization would occur in shells placed in sandy areas, among seagrass, or near anthropogenic structures. This study also aimed to determine whether or not the fish would prefer a single or a group of conch shells. We hypothesized that there would be higher colonization rates in the anthropogenic areas. Thirty-six conch shells were placed in shallow, shoreline areas (sand, sea grass and dock-cement areas). In each area, there were three single shells and three groups of three shells were placed. Based on our observations, fish colonization was highest in the anthropogenic area.

## Chemistry

### Schedule

*8:30 - 9:10 AM*

*ASC 104*

Nathan T. Kor (Md Fazal, Chemistry) Inhibitory Effects of Silver Nanoparticles on Acid Phosphatase

*9:00 - 9:30 AM*

*ASC 127*

Tyler J. Dick (Alicia Peterson, Chemistry) Rhodium catalyzed hydrogenation of fluoroarenes in mild condition

*9:00 - 9:30 AM*

*ASC 105*

Rebecca Flynn (Edward McIntee, Chemistry) Synthesis and biological testing of phosphonate inhibitors for Human Low Molecular Weight Protein Tyrosine Phosphatase

*9:00 - 9:30 AM*

*ASC 104*

Benjamin C. Kollaja (Md Fazal, Chemistry) Effect of glycation on the binding interactions of human serum albumin with magnetic nanoparticles (MNPs)

*9:00 - 9:30 AM*

*ASC 121*

Forrest P. Hyler (Christen Strollo Gordon, Chemistry) Understanding the Aqueous Phase Transformation of Glyoxal and Methylglyoxal

*9:30 - 10:00 AM*

*ASC 105*

Matthew Devery (Annette Raigoza, Chemistry) Astrochemistry

*9:30 - 10:00 AM*

*ASC 107*

Jasmine N. Tutol (Kate Graham, Thomas Jones, Chemistry) A Reductive Amination Approach

Involving Chiral Amino Acids to Selectively Set a New  
Chiral Center

9:30 - 10:00 AM  
ASC 121

Frantz D. Soiro (Christen Strollo Gordon, Chemistry)  
Prevalence of Ehrlichia chaffeensis and Ehrlichia  
ewingii in Amblyomma americanum and human  
samples from Suffolk County, New York State

9:30 - 10:00 AM  
ASC 127

Matt Lerick (Alicia Peterson, Chemistry) Seasonal  
effects on catalytic hydrodehalogenation of  
trichloroethylene by a rhodium catalyst

10:00 - 10:30 AM  
ASC 104

Dinuka K. Jayasooriya (Richard White, Chemistry)  
Measuring the concentration of Ozone using principles  
of Raman Spectroscopy

10:00 - 10:30 AM  
ASC 107

Adrian R. Demeritte (Kate Graham, Thomas Jones,  
Chemistry) Progress Towards Synthesis of  
Janolusimide A & B via anti-Aldol Reaction

10:00 - 10:30 AM  
ASC 121

Lorien E. Rusch (Christen Strollo Gordon, Chemistry)  
Characterization of aqueous glyoxal oxidation in the  
presence of salts using quartz crystal microbalance

10:00 - 10:30 AM  
ASC 127

Annastacia D. Stubbs (Alicia Peterson, Chemistry)  
Photolysis of Pharmaceuticals

10:00 - 10:30 AM  
ASC 105

Stephen M. Thomas (Annette Raigoza, Chemistry)  
Synthesis of silver nanoprisms; a lab development  
project adapted from a chem 203 experiment

10:30 - 11:00 AM  
ASC 105

Alex Schlangen (Annette Raigoza, Chemistry)  
Characterization of Surface Interactions between  
Biological Proteins and Functionalized Gold  
Nanoparticles

10:30 - 11:00 AM

- ASC 104* Emma Johnson (Richard White, Chemistry) Testing of the Raman Gas Analyzer
- 10:30 - 11:00 AM*  
*ASC 107* Jane C. Keohen (Kate Graham, Chemistry) Case Study and Literature Review of Nocardia Abscessus brain abscesses
- 10:30 - 11:00 AM*  
*ASC 121* Meghan M. Glasgow (Henry Jakubowski, Chemistry) Development of a Real Time Polymerase Chain Reaction (RT-PCR) Experiment
- 10:30 - 11:00 AM*  
*ASC 127* Zachary M. Brown (Alicia Peterson, Chemistry) Rh/Al<sub>2</sub>O<sub>3</sub> Catalyzed Hydrodehalogenation of TCE Under Mild Conditions
- 11:00 - 11:30 AM*  
*ASC 127* Jerred J. Russell (Brian Johnson, Chemistry) The Synthesis of a Model Multi-copper Oxidase
- 11:00 - 11:30 AM*  
*ASC 105* Paul Kress (Annette Raigoza, Chemistry) Studies of Functionalized Polyamidoamine (PAMAM) dendrimers using Scanning Tunneling Microscopy
- 11:00 - 11:30 AM*  
*ASC 121* Maria McGlinch (Henry Jakubowski, Chemistry) Malignant Hyperthermia Susceptibility: Diagnosis and Genetic Sequencing
- 11:00 - 11:30 AM*  
*ASC 107* Kirsten Sewall (Michael Ross, Chemistry) St. Cloud Water
- 11:00 - 11:30 AM*  
*ASC 104* Nathan Anderson (Richard White, Chemistry) Study of the Decomposition of Hydrogen Peroxide for Use in a Mono-propellant Thruster
- 11:00 - 11:30 AM*  
*ASC 127* Jerred J. Russell (Brian Johnson, Chemistry) The Synthesis of a Model Multi-copper Oxidase

## **Abstracts**

**Kor:** Silver nanoparticles are used as an anti-bacterial agent in many products. The focus of this project is to investigate the inhibitory enzymatic effects of silver nanoparticles on acid phosphatase, an enzyme that is essential to the normal biological processes of many organisms. The inhibitory effect of 100nm silver nanoparticles was measured under varying nanoparticle concentrations. Once an inhibitory concentration was identified, experiments were performed to investigate a number of effects caused by the inhibitor, including residual effects to enzymatic activity after the inhibitor was removed. The resulting data was analyzed using IGOR pro in order to determine the catalytic efficiency for acid phosphatase under these conditions. This research has shown an inhibitory effect of silver nanoparticles, and shed further light on how these nanoparticles affect the biological systems.

**Dick:** The fate of fluoroarenes in the environment has become an increasing concern due to the higher use of fluoroarenes in pharmaceuticals and industrial processes. One way to help alleviate this environmental concern is to explore ways in which fluoroarenes are degraded to benign compounds. Fluorinated aromatic compounds were catalytically hydrodefluorinated using a heterogeneous 5 wt % rhodium on alumina catalyst under mild conditions (1 atm. H<sub>2</sub>, 25°C). The catalytic hydrodehalogenation mechanism and substrate scope were explored by looking at a variety of substituted fluoroarenes. The effects of electron-withdrawing and electron-donating substituents as well as the position of the substituents to the fluorine atom (ortho, meta, para) were examined. The substrate degradation rates were monitored using GC/MS. When possible the intermediate(s), and product formation was examined as well. The fluorophenols are the fastest to undergo degradation with an average rate of  $5 \pm 2 \times 10^{-3} \text{ min}^{-1} \text{ mg}^{-1} \text{ Rh/Al}_2\text{O}_3$  and the fluoronitrobenzenes, with an average rate of  $0.9 \pm 0.8 \times 10^{-3} \text{ min}^{-1} \text{ mg}^{-1} \text{ Rh/Al}_2\text{O}_3$ , are the slowest.

**Flynn:** Human Low Molecular Weight Protein Tyrosine Phosphatase (LMW-PTP) has two active isoforms, isoform A (IFA) and isoform B (IFB). Studies have shown that the two isoforms have opposing activities in cell signaling, either anti-oncogenic or oncogenic, depending on the cancer type and stage. Due to the oncogenic properties of LMW-PTP, it has been chosen as a target for competitive inhibition. A known inhibitor of LMW-PTP is pyridoxal 5'-phosphate (PLP). However, PLP is a cofactor for many other enzymes. Hydrolysis-resistant phosphonate analogs of PLP have been chosen for synthesis and in vitro screening in both isoforms of LMW-PTP.

**Kollaja:** The increasingly widespread use of engineered nanoparticles has raised concern about their health impact and eco-toxicological effects. Iron oxide nanoparticles, due to their many unique properties, has been used in an array of clinical applications such as cancer therapy, gene delivery, and as contrast agents for magnetic resonance imaging (MRI). Upon entrance into the blood stream, the MNPs are immediately coated by proteins leading to the formation of protein



corona which facilitates their removal from the physiological system. The effects of glycation on human serum albumin-MNP interactions were studied using various spectroscopic techniques. A dose dependent increase in glycation level in human serum albumin and a gradual decrease in affinity of glycated albumin for MNPs were observed.

**Hylar:** Glyoxal and methyl glyoxal are the smallest dicarbonyls formed in the atmosphere from reactions of biogenic and anthropogenic sources and have been shown to be precursors for secondary organic aerosol (SOA).<sup>1</sup> There is insufficient data available on observed accretion reactions of glyoxal and methylglyoxal and aqueous reactions of these compounds may contribute to SOA formation.<sup>2,3</sup> Derivatives of glyoxal and methyl glyoxal are easily quantified using GCMS. Glyoxal and methyl glyoxal were reacted with O-(2,3,4,5,6-Pentafluorobenzyl)hydroxylamine hydrochloride (PFBHA) at a 1:10 ratio to ensure PFBHA doubly bound to both compounds. Standard calibrations for glyoxal and methyl glyoxal were created and the analytes were then reacted with hydroxyl radicals in the aqueous phase. The reactants and oxidation products are analyzed using GCMS and a greater number of MS peaks with larger mass to charge ratios suggests that larger compounds are forming through oxidation. Rate constants for the aqueous reactions of glyoxal and methylglyoxal have been determined. By understanding the mechanism by which SOA is formed in the atmosphere, we can better understand the emission sources that can contribute to SOA formation.

1. Lim, Y.B.; Tan, Y.; Turpin, B.J. Chemical insights, explicit chemistry, and yields of secondary organic aerosol from OH radical oxidation of methylglyoxal and glyoxal in the aqueous phase. 2013, *Atmos. Chem. Phys.* 13, 8651-8667
2. Ervens, B.; Turpin, B.J., Weber, R.J. Secondary organic aerosol formation in cloud droplets and aqueous particles (aqSOA): a review of laboratory, field and model studies. 2011, *Atmos. Chem. Phys.*, 11, 11069-11102.
3. Van Pinxteren, M.; Herrmann, H. Glyoxal and methylglyoxal in Atlantic seawater and marine aerosol particles: method development and first application during the polarstern cruise ANT XXVII/4. *J. of Atmospheric Chemistry and Physics*, 2013, 12(23), 11791-11802

**Devery:** The goal of this research is to gain a better understanding of what types of reactions occur in space, particularly regions of star and planet formation, how these molecules are observed, and how they are studied in the laboratory. This will be done by looking at what instruments are used to simulate interstellar conditions in the laboratory to gain information about molecules of interest, such as the HO<sub>3</sub> radical. A comparison of this laboratory data to rotational spectra of molecules in interstellar regions obtained using very large telescopes such as the Atacama Large Millimeter/submillimeter Array can give us insight into the chemical makeup of these gaseous interstellar clouds. Studying these interstellar regions from an astrochemical perspective can give insight into how stars and planets are formed and what conditions are needed for life to evolve.

**Tutol:** The polypeptide below has been found to have antibacterial properties. Phosphonate compounds of this type have been prepared before, but without stereochemical control of the phosphonate carbon, producing diastereomers of the compounds. It will be more cost effective and efficient to synthesize the desired stereoisomer by reducing purification steps for separating the enantiomers. The goal of the research is to synthesize this compound with stereochemical control. Using dimethyl phosphite, a reductive amination model will be used on amino acids to produce a phosphonate compound.

**Soiro:** Human Monocytic Ehrlichiosis (HME) is a tick-borne zoonotic disease resulting from infection with *Ehrlichia chaffeensis*, or less commonly, *E. ewingii* bacteria, transmitted via bites from infected *Amblyomma americanum* ticks. The goal of this study was to evaluate the prevalence of these ehrlichial agents in host-seeking *A. americanum* and determine associated HME risk in southeastern New York State. Standardized drag surveys targeting *A. americanum* were conducted for the years 2013 and 2014 at two publically accessible sites in Suffolk County, NY. Individual tick DNA extracts were screened using a real-time duplex PCR assay detecting *E. chaffeensis* and *E. ewingii*. A total of 545 nymphs and 107 adult *A. americanum* were tested, with overall prevalence of 2.9 and 8.4% for *E. chaffeensis* and 2.4 and 3.7% for *E. ewingii* in nymphs and adults, respectively. There were no co-infected tick samples. A total of 94 human blood samples from 2013 & 2014 testing negative for *E. chaffeensis* and *Anaplasma phagocytophilum* were screened by PCR for *E. ewingii*; 2 were positive. While nymphal tick infection rates with these two agents were found to be similar during the study period, HME resulting from *E. ewingii* infection is considerably rarer than *E. chaffeensis* in NY, indicating that factors other than pathogen prevalence play a role in transmission and infection, or that *E. ewingii* infection may underreported in NY.

**Lerick:** Trichloroethylene (TCE), a chlorinated hydrocarbon, has been extensively used as a metal degreaser, as an electronic component cleaner, and in paint and ink production and is an environmental concern, especially in areas where dumping of industrial waste has occurred. Much research has been done to develop methods to degrade chlorinated hydrocarbons, like TCE, to more environmentally benign alkanes and alkenes. Examples of such methods include biological and catalytic degradation. Previous research has allowed for the development of a heterogeneous rhodium catalyst (5 wt % Rh/Al<sub>2</sub>O<sub>3</sub>). In this study, the kinetics of the catalytic degradation of TCE by this rhodium catalyst in Lake Sagatagan (Collegeville, MN) water were studied under mild conditions (1 atm. H<sub>2</sub>, 25°C). The year round seasonal effects on the activity of this catalyst have not yet been observed. This study aims to observe the effect that lake water collected during the winter and spring has on the rate of the degradation of TCE by the rhodium catalyst and compare to previous summer and fall water samples. A better understanding of the environmental effects on the catalytic degradation of TCE will allow for easier application of remediation methods.

**Jayasooriya:** The goal of this library research is to use principles of Raman spectroscopy to measure Ozone concentrations via dual differential absorption lidar based on Raman-shifted Nd: YAG or KrF laser. The intent is to link the use of the frequency/wave number of the vibration modes, unique to the Raman spectroscopy of Ozone. This method uses an Nd: YAG or KrF lasers to excite the Ozone molecule in the troposphere and detecting the backscatter to measure the concentration of Ozone in the atmosphere. While the atmosphere constitutes many particles apart from Ozone, this method utilizes three wavelengths to accurately measure the concentration of Ozone while minimizing the effects of aerosol interference. What is novel about this method is that it uses both, a dual differential absorption lidar as opposed to a conventional differential absorption lidar, which typically uses two wavelengths, and the detector is placed in the same location as the source as opposed to conventional laboratory methods where the detector is placed normal to the sample. The possible application of this method would be to calculate the overall levels of Ozone concentration in the troposphere in order to control levels for its potential consumption and exhaustion as a greenhouse gas.

#### Works Cited

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Selig, H., & Claasen, H. H. (1968). Raman spectrum of Ozone. *Israel Journal of Chemistry*, 499 - 500.

Wang, Z., Gong, Z., & Zhou, H. H. (1996). Evaluation of dual differential absorption lidar based on Raman-Shifted Nd: YAG or KrF laser for tropospheric ozone measurements. *Applied Physics B*, 143 - 147.

**Demeritte:** Janolusimide A, and its N-methyl analogue Janolusimide B are natural lipophilic tripeptide marine toxins produced by bryozoans (moss animals) or nudibranchs (soft bodied mollusks), which are present in many benthic marine habitats. These compounds act as cholinergic agents and thus are effective antifeedants for rodents, making them prime targets for total synthesis. However, these lipophilic neurotoxins have been synthesized very few times. Previous syntheses of Janolusimide A have occurred over thirteen steps and required the use of a chiral catalyst to set stereocenters. Additionally, previous methods have merely attached the indicated lactam to the formed dipeptide chain without taking advantage of its stereocenter directing properties. The goal of this research project was to develop a shorter synthesis for the modified tripeptides Janolusimide A & B via an Evans magnesium halide catalyzed anti-Aldol reaction. Thus far, the acyclic dipeptide aldehyde fragment has been synthesized in good yield, 77% over 3 steps, and selectivity for the aldol reaction is currently being tested using a chiral motif.

**Rusch:** The focus of this project is to determine the physical properties of products formed from the aqueous phase reactions of glyoxal with hydroxyl

radicals. Glyoxal is the most abundant dialdehyde in the atmosphere and contributes to the formation of secondary organic aerosol (SOA), which contributes to climate change. The climate is affected directly when solar radiation is absorbed or deflected and indirectly by clouds that form on aerosols (cloud condensation nuclei).<sup>1</sup> A quartz crystal microbalance (QCM) equipped with a humidity controlled flow cell is used to measure the deliquescence of a variety of reaction solutions.<sup>2</sup> Solutions are aspirated onto the quartz crystal and subsequently dried, then exposed to increasing humidity.<sup>3</sup> Understanding SOA in aqueous aerosols has the potential to eliminate the gap between predicted and measured SOA. Here, we describe the specific characteristics of the aqueous reaction of dialdehydes commonly present in the atmosphere as well as the effect of the presence of salts has on the deliquescence of the resultant solutions.

**Stubbs:** Today, many chemicals, including pharmaceuticals, end up in our water systems and aquatic environments, many having possible adverse effects on aquatic life and marine habitats.<sup>1</sup> In response to this growing environmental concern, research has been conducted that focuses on the identification and quantification of several different pharmaceuticals in aquatic systems.<sup>2</sup> In determining the potential adverse effects of these compounds once in the environment, it is helpful to determine the life expectancy of the pharmaceuticals once in an aquatic environment via exposure to light from the sun. The Photolysis of Pharmaceuticals experiment was formulated for the purpose of determining pharmaceutical photolytic degradation rates and was used as an Integrated Chemistry 305 Lab experiment at CSB|SJU. The procedure required that various pharmaceuticals be taken and subjected to the process of photolysis through which data on their degradation rates can be obtained. Data was quantified using High Performance Liquid Chromatography (HPLC). In this experiment, we suggest modifications that can be made to create a better method and produce more easily quantifiable data for students. Four pharmaceuticals were used in this experiment: diclofenac sodium salt, flumequine, naproxen sodium and oxytetracycline hydrochloride. We report our findings on each pharmaceutical, and suggest that, unlike the original procedure that proposed the use of 100mM pharmaceutical solutions in water, lower concentrations in methanol are better suited for testing.

#### Citations

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**Thomas:** A silver nanoprism synthesis experiment is part of the synthesis laboratory curriculum at CSB/SJU. As part of this experiment, students

synthesize silver nanoprisms with a lateral dimension ranging between 10-70 nm. The vast majority of the students who have performed the lab experiment have struggled to successfully synthesize silver nanoprisms that display properties consistent with the chemical literature. Due to the small size of the nanoparticles, the instrumentation used to analyze them may not be capable of accurately determining their size. Therefore, methods have been developed to increase the size of the nanoparticles. The lab experiment is adapted from Kitaev et al. and focuses on synthesizing silver nanoprisms of variable sizes by implementing KBr, which binds with silver particles in order to inhibit the growth of silver nanoprisms.<sup>1</sup> In comparing this procedure with another silver nanoprism synthesis, done by Panzarasa, different synthesis mole ratios were used in order to induce the growth of larger silver nanoprisms.<sup>2</sup> Dynamic light scattering (DLS) instrumentation and UV-Vis spectroscopy were used to analyze the varying sizes of silver nanoprisms.<sup>3</sup> The ultimate goal in these studies was to produce silver nanoprisms large enough to be accurately analyzed using DLS instrumentation. A correlation between the amounts of H<sub>2</sub>O<sub>2</sub> added to the reaction and the size of the nanoprisms has been discovered. By increasing the amount of H<sub>2</sub>O<sub>2</sub> relative to the amount of AgNO<sub>3</sub>, larger nanoprisms can be synthesized. These results can be implemented within the CSB/SJU synthesis lab experiment to expand the range of nanoprisms synthesized by students and allow the accurate analysis through DLS and UV-Vis spectroscopy.

**Schlangen:** Within the body, proteins perform highly specific tasks within aqueous environments but their behavior is difficult to reproduce through abiological methods. Attaching a protein to an inorganic substance like gold increases the risk of aggregation and loss of function due to the dramatic change in the environment. Our approach to minimizing these effects is to place an organic layer between the protein and the inorganic surface. By changing the properties of the organic layer, we can also influence how or where proteins adsorb on the surface. In this study, we used a modified Turkevich method to synthesize 20nm gold nanoparticles (GNP).<sup>1</sup> Once the GNP were developed, we functionalized their surface using an equivalent concentration to surface ratio of a known study.<sup>2</sup> These functionalized GNP were then analyzed using a modified Dynamic Light Scattering technique.<sup>3</sup> These methods helped us discover a technique for the adsorption of Bovine Serum Albumin (BSA) onto a homogeneously functionalized gold nanoparticle surface, which would be helpful to many biomedical applications such as targeted cell drug delivery systems and biosensors.

**Johnson:** The National Energy Technology Laboratory Raman Gas Analyzer (NETL-RGA) is a recently-developed spectroscopy system that uses laser light to produce Raman scattering, which leads to the identification and quantification of gases in a mixture. One key factor in designing a new instrument for widespread application is the determination of the parameters for optimal use of the instrument. To begin this process, mass flow controllers were purchased for the laboratory that would provide appropriately low concentrations of a species of

interest down to 0.01% species of interest. Species of interest in natural gas were introduced to the instrument in a variety of concentrations with a N<sub>2</sub> diluent. The limit of blank, method detection limit, and limit of quantification were determined for these species of interest at 20 psia and 60 psia. The low parameters of the RGA, as well as the real-time, continuous read-out of relative mole percentages of many fuel gases, makes this a novel, new instrument. The limit of blank and method detection limit were determined for CH<sub>4</sub>, H<sub>2</sub>, and CO, but true, quantitative values were not calculated for the limit of quantification due to the large error associated with each result. Further research should be conducted to determine the parameters for other main components of natural gas: O<sub>2</sub>, CO<sub>2</sub>, C<sub>2</sub>H<sub>4</sub>, C<sub>3</sub>H<sub>8</sub>, C<sub>4</sub>H<sub>10</sub>, H<sub>2</sub>O. This system's measurements, in the power industry, will permit adjustments in gas turbine engines to enable optimal, efficient combustion control based on the changes in fuel composition.

**Keohen:** Six cases of nocardiosis with a disseminated brain abscess due to *Nocardia abscessus* were reviewed and combined with a case study. Signs, symptoms, past medical history, diagnostic procedures, and medications were all analyzed. All of the patients had a decrease in the size of the brain abscess after treatment and all patients with pulmonary nocardiosis saw complete resolution within the lungs. Due to proper treatment and care, all 6 patients survived the infection and their symptoms returned to normal. Even with extremely high mortality rates for *Nocardia*, it was seen that brain abscesses caused by *Nocardia abscessus* are not fatal if properly treated. Physicians can properly treat patients suffering from this infection and patients have a high potential of returning to normal life.

**Glasgow:** The Polymerase Chain Reaction (PCR) is a method of DNA amplification that is both rapid and versatile. It is used in a variety of fields including medical and forensics testing (Elkins Kadunc, 2012). The goal of this experiment is to develop a PCR-based laboratory exercise for either the Synthesis or Integrated Lab, allowing all CSB/SJU chemistry students to have experience with this technique. In this experiment, genetically unique DNA sequence from two different bacteria strains were found through a series of BLAST searches (Ye et al. 2012). *Pedococcus Damnosus* (gram negative) and *Bacillus Cereus* (gram positive) were grown and genomic DNA was purified from them. Forward and reverse primers were then designed to amplify unique DNA sequences. A thermocycler was used to amplify the target sequences from the DNA samples. The success of the amplification was then verified by agarose gel electrophoresis. The final step is to develop a "manual" real time PCR (RT-PCR) in which DNA amplification is run on a thermocycler and quantitation on a fluorescent plate reader. This process will teach students how to grow bacteria, isolate DNA, identify unique DNA sequences and appropriate primers, run PCR, and use fluorescence to rapidly identify DNA in a target bacterial sample.

**Brown:** Chlorinated hydrocarbons, such as trichloroethylene (TCE), are a problem in many industrial areas where dumping of industrial waste has

occurred. Research has grown in the area of complete degradation of these compounds to alkanes and alkenes, which are much less harmful to the environment. In this study, the kinetics of the catalytic degradation of TCE by a heterogeneous rhodium catalyst, 5 wt % Rh/Al<sub>2</sub>O<sub>3</sub>, were examined under various mild conditions (1 atm. H<sub>2</sub>, 25° C). Among the variations include using different seasons of natural lake water (obtained from Lake Sagatagan in Colledgeville, MN) and using different concentrations of naturally-occurring inorganic salts (including sulfite, sulfate, and nitrate). The degradation of TCE to ethane was monitored using GC-FID. Reactions in DI water were fastest, with an average rate of  $427.5 \times 10^{-5} \text{ s}^{-1} \text{ mg}^{-1} \text{ Rh/Al}_2\text{O}_3$ . Higher pH levels showed an increase in reaction rate, and sodium sulfite showed significant catalyst poisoning, even though increasing concentrations increased the rate—suggesting an alternate reaction pathway.

**Russell:** This project focuses on the synthesis and characterization of a novel copper (I) complex with a new TAPMA-based ligand. This TAPMA ligand is modeled after the tris (2-pyridylmethyl) amine-based (TPMA) ligand family where nitrogen based donors are employed. The TAPMA ligand contains three tridentate substituted pyridine arms attached onto a 1,3,5-Tris(azidomethyl)-2,4,6-triethylbenzene derivative. This project seeks to develop a functional model of multi-copper oxidases to understand the mechanism of oxygen binding in the ceruloplasmin protein and others protein motifs like it. The formation of the tri-nuclear copper site is novel to the field of inorganic chemistry due to the ligand complexing 3 equivalents of copper. This project involves a three-step organic synthesis of the ligand where click-chemistry is employed to join the two portions of the TAPMA ligand via a cycloaddition mechanism. Following the ligand synthesis is a one-step inorganic synthesis and recrystallization of the model active site via ligand addition to Cu (I). It was then hoped a crystal structure could be obtained and oxygen reacted with the structure to study its mechanism. Thus far sufficient data (IR and NMR) on the ligand synthesis was obtained, the synthesis yielding a golden yellow solid. The Cu (I) complex requires further testing to definitively prove that the ligand is capable of binding the metal and forming a tri-nuclear site; however, NMR data shows broadening of key peaks that suggest the binding of the copper center by the TAPMA ligand.

**Kress:** Functionalized polyamidoamine (PAMAM) dendrimers are being studied as a way of making recoverable reagents. This research focuses on high-resolution imaging of MacMillan-type functionalized PAMAM dendrimers using scanning tunneling microscopy (STM). Here, STM imaging is used to obtain the lateral and spatial dimensions of functionalized dendrimers once they have been deposited on a gold surface as well as the proximity of the dendrimers to each other. Thus, imaging at this resolution can provide insight into interactions between dendrimers on the surface and show if functionalized dendrimers arrange differently than non-functionalized PAMAM dendrimers. Together with data from un-functionalized PAMAM dendrimers it is possible to see the growth of the functionalized dendrimers at their various steps of functionalization. This

research provides the first look at MacMillan-type functionalized PAMAM dendrimers on a gold surface to further our understanding of how these functionalized dendrimers interact with each other, especially when compared to their non-functionalized counterparts.

**McGlinch:** Research was performed at The Uniformed Services University of Health Sciences in Bethesda, Maryland. The purpose of this research was to analyze mutations associated with Malignant Hyperthermia Susceptibility (MHS), a disorder that causes a hyper metabolic response to volatile inhaled anesthetics. The patient must first undergo a specialized muscle biopsy to provide a tissue sample that is analyzed using a caffeine and halothane contracture test (CHCT), the results of which can be indicative of MHS. DNA is then extracted from the biopsied muscle, amplified by the polymerase chain reaction (PCR), sequenced, and its chromatogram is analyzed. Any variant(s) of unknown significance (VUS) are analyzed for amino acid changes and then compared to mutations posted on worldwide genetic databases. Similarities in DNA with patients suspected of MHS are examined. MHS is a difficult disorder to diagnose; a positive CHCT must be supplemented by clinical history and genetic factors. A mutation was found in a particular patient and correlated with an unrelated case. This process is applicable to any genetic disorder. This research also has a broad social and professional impact as MHS is a disqualifying condition for the military and can end potential or current careers.

**Sewall:** The goal of the research project was to determine the age of water throughout the city of Saint Cloud. The research was conducted in both the summer and in the winter to compare the different water flows throughout the year. That is why this project was important. The project informs whether water is sitting stagnant in the pipes too long. Fluoride concentration was used as the measure of the water age because fluoride is stable in the water up to 28 days after collection (Rum). The instrument used was an Accumet fluoride probe, and a standard procedure was followed (Rum). Fluoride concentration is also good to keep track of because it can have many effects on the molecular structures in the human body causing folding and denaturing of proteins (Jiang). The city has the water purification process up online so anyone can look up this process, but we do not know how long it takes the water to go from the plant to a home or business. Both summer and winter projects have been done and completed. The maps generated with the data will show the water progression throughout the city.

**Anderson:** The goal of this research project is to study the decomposition of hydrogen peroxide and its application in a monopropellant thruster system. The first thing to discuss is the thermodynamics surrounding monopropellant propulsion systems. Next would be current catalyst optimization and development for hydrogen peroxide decomposition. Lastly is the comparison to current propellant systems (specifically hydrazine) and the viability of a hydrogen peroxide system. One novel thing about the project is the attempt to



find the optimal catalyst for this system; so many exist but no standardized comparison has been made, yet some can be ruled out on purely physical properties alone. Currently many catalysts are under research, and more and more emphasis is being placed on optimizing a hydrogen peroxide thruster. Potential applications are for the actualized development of a thruster using the optimal catalyst found through standardized testing. Once the design has been made and optimized, comparison to other systems and feasibility tests will help determine if such a system could be applied to any number of things that require thrust. The implementation of a hydrogen peroxide thruster could cut costs, environmental impact, and would be safer (in some aspects) than current monopropellant systems.

#### References:

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**Russell:** This project focuses on the synthesis and characterization of a novel copper (I) complex with a new TAPMA-based ligand. This TAPMA ligand is modeled after the tris (2-pyridylmethyl) amine-based (TPMA) ligand family where nitrogen based donors are employed. The TAPMA ligand contains three tridentate substituted pyridine arms attached onto a 1,3,5-Tris(azidomethyl)-2,4,6-triethylbenzene derivative. This project seeks to develop a functional model of multi-copper oxidases to understand the mechanism of oxygen binding in the ceruloplasmin protein and others protein motifs like it. The formation of the tri-nuclear copper site is novel to the field of inorganic chemistry due to the ligand complexing 3 equivalents of copper. This project involves a three-step organic synthesis of the ligand where click-chemistry is employed to join the two portions of the TAPMA ligand via a cycloaddition mechanism. Following the ligand synthesis is a one-step inorganic synthesis and recrystallization of the model active site via ligand addition to Cu (I). It was then hoped a crystal structure could be obtained and oxygen reacted with the structure to study its mechanism. Thus far sufficient data (IR and NMR) on the ligand synthesis was obtained, the synthesis yielding a golden yellow solid. The Cu (I) complex requires further testing to definitively prove that the ligand is capable of binding the metal and forming a tri-nuclear site; however, NMR data shows broadening of key peaks that suggest the binding of the copper center by the TAPMA ligand.

## Schedule

*10:30 - 10:50 AM*

*PEngl 325*

Gabriel MacDonald (Stephen Saupe, NATS) Reverse osmosis desalination applications

*10:50 - 11:10 AM*

*PEngl 325*

Megan Lenz (Stephen Saupe, NATS) Cardiac Tissue Engineering: Using Induced Pluripotent Stem Cells to Repair Damaged Cardiac Tissue

*11:10 - 11:30 AM*

*PEngl 325*

Danielle Schlender (Stephen Saupe, NATS) The Effectiveness of Presenting Sex Education in Scientific and Medical Terms

*11:30 - 11:50 AM*

*PEngl 325*

Grant R. Salk (Stephen Saupe, NATS) Swine Agriculture: The Use, Fate, and Treatment of Tetracycline

## Abstracts

**MacDonald:** I will present on the applications, effectiveness, and overall process of reverse osmosis for water desalination. Specifically, I will present a brief history, talk about RO membrane technologies, give a few examples of the physics and math involved in application, and end by talking about limiting factors and possible solutions.

**Lenz:** Heart Disease is the number one cause of death in the United States and affects many individuals on a daily basis. The purpose of this study was to explore possible tissue regeneration therapies to improve and recover function of damaged myocardial tissue commonly seen as an effect of many heart diseases. Cardiac tissue engineering using induced pluripotent stem cell derived cardiomyocytes (iPSC-CMs) is a relatively new method that involves dedifferentiating cells from any tissue of the host into pluripotent stem cells. These cells are then guided to be differentiated into functioning myocardial cells that can be used to repair damaged tissue and restore cardiac function to affected areas. The process and comparisons with similar techniques will be discussed.

**Schlender:** This senior NATS capstone project examines sex education curriculums that are taught in science and health classrooms around the United States. The effectiveness of various scientific and/or clinical based sex education curriculums was evaluated based on students' knowledge of STIs and their likelihood of partaking in risky behavior that could expose them to STIs.

**Salk:** The purpose of this thesis is to explore the occurrence of tetracyclines utilized among swine agriculture. This thesis covers the many purposes and uses of tetracyclines that are administered for swine agriculture. The purposes for administration include disease prevention, disease treatment, increased reproduction, and growth enhancement. The three parent tetracyclines (tetracycline, oxytetracycline, chlortetracycline) and their metabolites or degradation products were studied in order to determine toxicity, resistance, environmental triggers, and percent degradation. This study then compared the antibiotic degradation efficiency in swine manure among various methods of organic waste treatments including lagoon storage, composting, aerobic biofiltration, anaerobic digestion, and pyrolysis. The greenhouse gases associated with these organic waste treatment methods were evaluated in this thesis as well. Temperatures above 170 °C will allow for tetracyclines to begin to degrade while temperatures of just 55 °C found in the thermophilic stage of composting is hot enough to kill mesophilic bacteria and pathogens. The three-phase process of anaerobic digestion, followed by composting, and finally pyrolysis seemed to be the most efficient sequence of treatments when it came to minimizing swine waste while effectively degrading the antibiotics contained in the manure.

## **Nursing**

### **Schedule**

*9:00 - 9:20 AM*

*Main 322*

Kimberly Moy, Tara Frey, Kendall Rose (Lindsay Anderson, Nursing) Improving Communication at ELIM in Milaca

*9:00 - 9:20 AM*

*Main 323*

Danielle Rudin, Callie Justin, Valerie Clintsman, Cassie Spoden (Kathleen Ohman, Nursing) A Collaborative Approach to Reducing Staff Injury During Client Transfers

*9:30 - 9:50 AM*

*Main 322*

Meredith Rolfs, Angela Bathke, Alexis Good, Biruk Zekewos (Kathleen Ohman, Nursing) Efficacy of TED Stocking Use at a Local Hospital

*9:30 - 9:50 AM*

*Main 323*

Katherine Hohmann, Hannah Gurbada, Megan Lampel (Lindsay Anderson, Nursing) Preceptor Evaluation Tool

*9:30 - 9:50 AM*

- Main 320* Catherine Wohletz, BeaAnn Hagert, Nicole Rocheford, Laura Peterson, Ella Cameron, Alexa Juan (Gary Gillitzer, Nursing) Quality Sleep Study
- 10:00 - 10:20 AM  
Main 320* Nicole E. Nelson, Amy E. Bechtold, Lauren N. Rupp, Savannah J. Aultman, Alicia R. Evenson (Luann Reif, Nursing) Changing the Way You Assess Pain
- 10:00 - 10:20 AM  
Main 323* Alison E. Dudek, Nicole A. Berdan (Carie Braun, Nursing) Modified Exercises for Older Adults
- 10:00 - 10:20 AM  
Main 322* Eleanor Vanasse, Sarah Atkinson (Gary Gillitzer, Nursing) Improving Sleep Quality to Prevent Falls
- 10:30 - 10:50 AM  
Main 322* Jenna Friedrichs, Karina Barabash (Carie Braun, Nursing) Non-Pharmacological Therapy for Chronic Pain
- 10:30 - 10:50 AM  
Main 323* Nicole Gapinski, Anne Sinner, Cullen McAnally, Mark Henning (Kathleen Ohman, Nursing) Essential Oil Use Among Elderly Individuals on Psychotropic Medications
- 11:00 - 11:20 AM  
Main 323* Madeline Pekarek, Zoe Harrison, Lauren Schoenbauer, Jenna Schlangen, Kristina Ruchti (Luann Reif, Nursing) Quality Improvement focused on handoff reports and communication in the long term care setting
- 11:00 - 11:20 AM  
Main 320* Grace Farley, Katharine Trone, Emily Stommes, Mary Franz, Lindsay Jenderko (Carie Braun, Nursing) Missing Resident Policy and Elopement Protocol

## **Abstracts**

**Moy, Frey, Rose:** This presentation summarizes our work at ELIM in Milaca this spring where we identified the causes of communication breakdown in the facility, the effects of that breakdown, our interventions and the results of those interventions.

**Rudin, Justin, Clintsman, Spoden:** A literature review of safe patient handling was conducted with the objective of collecting data to implement a teaching method in order to reduce employee back strains at Foley Heritage Center. Empirical research analysis, staff interviews, and facility data (employee-reported injuries from the past 3 years) were synthesized and recommendations were presented to the facility.

**Rolfs, Bathke, Good, Zekewos:** The project included a literature review and analysis of the efficacy of TED stocking use in the orthopedic population. Findings were inconclusive for eliminating their use, but support further education of staff on proper application to prevent skin breakdown.

**Hohmann, Gurbada, Lampel:** Our presentation is on a tool that will be used at the Elim Care and Rehab Center in Milaca to evaluate nursing assistants and their ability to be a preceptor at this facility. The tool will include the various policies of the facility that apply to nursing assistants. The purpose of this tool is to help the facility standardize the qualifications of preceptors.

**Wohletz, Hagert, Rocheford, Peterson, Cameron, Juan:** Our project will be an oral presentation about the quality improvement project on the effect quality of sleep has on pain management. This is a 2-year study being implemented in a long-term care facility in which we completed a clinical rotation. We will introduce the objective of the grant received for the study and elaborate on its implementation. We will further discuss the barriers to implementation and how this impacted its effectiveness. We will conclude by sharing our experience in participating in the project and how the quality improvement process will continue.

**Nelson, Bechtold, Rupp, Aultman, Evenson:** Throughout our capstone experience at Knute Nelson Long Term Care facility we found that pain assessment and management were areas in need of improvement. Through evidence based research we found new assessment tools to enhance how pain is assessed, which will in return increase how pain is managed and controlled throughout the facility.

**Dudek, Berdan:** Nursing home residents in wheelchairs may be unable to do typical exercises to maintain strength, flexibility, and balance. This project explored alternatives to traditional exercise for wheel-chair bound residents and created a plan for improvement in the current exercise program. We also summarized the effects of sitting for extended periods of time on cognition and brain function.

**Vanasse, Atkinson:** This quality improvement project was performed to evaluate a number of modalities related to sleep, in an effort to reduce falls, thus improving the safety for clients in the nursing home.

**Friedrichs, Barabash:** This presentation is a quality improvement project that focused on the use of non-pharmacological therapies to manage chronic pain. We interviewed a group of residents who were diagnosed with chronic pain, researched alternative therapies for pain, developed a plan to be implemented, and executed our ideas. Implementation included the use of essential oils, exercise, and massage, which proved to be beneficial for the residents. A plan for facility follow up has been created to determine whether these modalities were sustained in order to evaluate the long-term effectiveness of the project.

**Gapinski, Sinner, McAnally, Henning:** The use of essential oils to enhance mood and reduce depressive symptoms in geriatric residents residing in a nursing home was examined. Recommendations were made for inclusion of essential oils as part of resident care.

**Pekarek, Harrison, Schoenbauer, Schlangen, Ruchti:** Our project focuses on improving communication through documentation in the long term care setting. We have developed a kardex form for staff at the Assumption Home to document significant events/changes in residents' statuses and any need to know information for all staff. The purpose of this project is to prevent any adverse events from occurring by improving communication among the registered nurses, licensed practical nurses, and nursing assistants. We have created this form to condense the documentation forms into one spot. Therefore, staff will only have to look in one spot for what they need to know.

**Farley, Trone, Stommes, Franz, Jenderko:** This presentation is a quality improvement project that focused on best practices, updating and testing the Missing Resident Policy and Elopement Protocol in an effort to provide the facility with a more simple and efficient way to recover missing residents.

## **Nutrition**

### **Schedule**

*8:00 - 8:20 AM*

*ASC 142*

Jenna C. Bautch (Jayne Byrne, Nutrition) Can Your Exercise Habits Affect Your Blood Lipids and Resting Blood Pressure Values?

*8:30 - 8:50 AM*

*ASC 142*

Laura Comee (Amy Olson, Nutrition) Hydration status, habits, and knowledge of collegiate cross country runners

*8:40 - 9:00 AM*

*ASC 142*

Tori M. Grootwassink (Amy Olson, Nutrition)  
NUTRITIONAL KNOWLEDGE AND

## NUTRITIONAL PRACTICES OF DIII COLLEGIATE DANCERS

*9:00 - 9:20 AM*  
*ASC 142*

Jackie R. Kemnic (Amy Olson, Nutrition) THE PREVALENCE OF THE “FRESHMAN 15” IN FIRST YEAR MALE AND FEMALE STUDENTS

*9:30 - 9:50 AM*  
*ASC 142*

Charles B. Wenner (Emily Heying, Nutrition) EFFECTS OF SPORTS DRINK CONSUMPTION ON SALIVARY PH DURING EXERCISE

*10:00 - 10:20 AM*  
*ASC 142*

Bao Yang (Emily Heying, Nutrition) THE CORRELATION BETWEEN TECHNOLOGY USAGE, HEALTH BEHAVIORS, AND ACADEMIC PERFORMANCE

*10:30 - 10:50 AM*  
*ASC 142*

Jake I. Wagner (Emily Heying, Nutrition) What is the evidence that xylitol chewing gum decreases cariogenic bacteria population in college-aged students?

*11:00 - 11:20 AM*  
*ASC 142*

Mary Cherne (Alexa Evenson, Nutrition) What is the relationship between CVD risk factors and dietary calcium intake in a college-age population?

### **Abstracts**

**Bautch:** WHAT IS THE CORRELATION BETWEEN COLLEGE STUDENTS’ HABITUAL EXERCISE PATTERNS, FASTED LIPID PROFILE AND RESTING BLOOD PRESSURE MEASUREMENTS? Bautch, J.C. and Byrne, J. MS, RDN, LD, College of St. Benedict, St. Joseph, MN

The American College of Sports Medicine (ACSM) recommends college students participate in aerobic and anaerobic exercise to improve their fasting blood lipids and resting blood pressure measurements.

Purpose: To examine how college students’ exercise habits impact their fasting blood lipids and resting blood pressure measurements.

Methods: Institutional Review Board approval was obtained and informed consent were signed before research was conducted. One hundred and thirty-eight students from a private college were asked to complete an exercise questionnaire regarding the average frequency and duration of aerobic and anaerobic exercise performed over a one-week span. Students’ fasting HDLs,

LDLs, TGs and resting blood pressure values were matched to completed exercise questionnaires. Data was analyzed using SPSS to determine correlations between exercise habits and blood lipids or blood pressure measurements and to establish if there were differences between sexes for lipids and blood pressure measurements.

Results: The amount of physical exercise was not correlated to fasting blood lipids or blood pressure measurements. Seventy-one percent of students meet the ACSM exercise recommendations for 30 minutes of moderate-intense physical activity 5 days/week. Average fasting HDLs ( $55 \pm 14$  mg/dL), LDLs ( $81 \pm 25$  mg/dL), TGs ( $95 \pm 48$  mg/dL), and resting blood pressure (107/70 mmHG) measurements were in normal ranges set by the Center for Disease Control (CDC). Twenty-five percent of students are above the CDC recommendation for TGs, 5% over LDLs, and 30% are under for HDL measurements. Males had significantly lower HDLs ( $\sim 47 \pm 12$  mg/dL) compared to women ( $\sim 58 \pm 14$ ) ( $p=0.01$ ). Males had significantly higher resting diastolic blood pressure readings ( $\sim 71$  mmHG) compared to women ( $\sim 69$  mmHg) ( $p=0.01$ ).

Conclusion: College students' from the study were fairly active which may have lead to the lack of correlation between physical activity and blood lipids.

However, 29% of the students do not meet the ACSM recommendation for days/week. Exercise may not significantly affect blood lipids or blood pressure when blood lipids or blood pressure measurements are within normal limits.

While 29% of students do not meet the ACSM recommendations, 15% of those students also do not meet the CDC recommendations and would benefit from lipid management education.

**Comee:** Dehydration exceeding 2% loss of body mass can cause decreased cognitive and physical performance in endurance athletes.<sup>1</sup> While many runners carry water bottles with them, most do not know their sweat rate or fluid recommendations, increasing the risk for heat-related illnesses such as heat stroke.<sup>2</sup> Purpose: To assess hydration status, habits, and knowledge of collegiate cross country runners. Methods: Institutional Review Board approval was obtained and subjects completed informed consents. Thirty-three female and twenty-five male Division III collegiate runners participated in the study. Hydration status was assessed measuring the specific gravity of three urine samples one each before a race, recovery run, and workout run. Participants completed questionnaires regarding hydration knowledge and habits. Sweat rates were calculated for each runner to estimate fluid losses. Water bottles were swabbed with a 3M quick swab around the lid and areas that touch the mouth and cultured using 3M aerobic petrifilms to assess cleanliness. ANOVA and T-tests were used for statistical analysis using SPSS. Results: There were no significant differences in the average urine specific gravity, however there was a bi-modal distribution and 50% of runners began the race dehydrated compared to 32.8% before the workout and 36.2% before the recovery run. Fluid consumption was significantly lower before the race compared to the other types of runs (Race:  $443.4 \pm 375$  mL, Workout:  $1206.3 \pm 552.6$  mL, Recovery:  $1287 \pm 792$  mL;  $p=0.002$ ). Fluid consumption was similar between males and females before the



workout and recovery run (Workout: males  $1153.8 \pm 459\text{mL}$ , females:  $1235.4 \pm 600.9\text{mL}$ ,  $p=0.578$ ; Recovery: males  $1240.5 \pm 664.8\text{mL}$ , females:  $1209.6 \pm 663.9\text{mL}$ ,  $p=0.499$ ). However, males did consume more fluid before the race (Males:  $661.68 \pm 471.6\text{mL}$ , Females:  $324.6 \pm 244.8\text{mL}$ ;  $p=0.09$ ) Sweat rates were higher in males (Males:  $1377.6 \pm 335.1\text{mL/hr}$ , Females:  $1128.6 \pm 320.7\text{mL/h}$ ;  $p=0.005$ ) and males ran more miles per week (males:  $65.77 \pm 12.6$ , females:  $47.64 \pm 10.17$ ;  $p=.000$ ). The average knowledge score was 58% for males and 61% for females. The majority (64.9%) of water bottles cultured had bacteria too numerous to count. Conclusions: 21% of all participants (8 males, 4 females) were severely dehydrated prior to competition. Sweat rates (mL/hr) of males were 18% higher, and males ran on average 18 more miles per week, yet consumed approximately the same amount of fluid as females before the recovery and workout runs. Males consumed more fluid before the race, but 57% of males were dehydrated compared to 45% of females. Water bottle cleanliness should be addressed by runners. Total aerobic plate count only assesses the amount of bacteria and future research is needed to determine whether the bacteria is pathogenic.

1. Thomas, D.T., Erdman, K.A., & Burke, L.M. (2016). Position of the Academy of Nutrition and Dietetics, Dietitians of Canada, and the American College of Sports Medicine: Nutrition and Athletic Performance. *Journal of the Academy of Nutrition and Dietetics*, 116(3), 501-28. doi: 10.1016/j.jand.2015.12.006.
2. Brown, S., Chiampas, G, Jaworski, C., & Passe, D. (2011). Lack of awareness of fluid needs among participants at a Midwest marathon. *Sports Health*, 3(5), 451-4.

**Grootwassink:** Professional ballet dancers on average weigh 10 to 20% below ideal weight (1). The NCAA does not monitor collegiate dance teams, so body weight and nutritional practices of collegiate dancers is relatively unknown. Purpose: To determine if the collegiate dancers are considered at risk for developing an eating disorder and to assess nutritional misconceptions. Methods: 25 Division III female dance team members participated in the study. Approval from the Institutional Review Board (IRB) was obtained, and subjects completed an informed consent. Subjects were asked to complete an electronic survey that was distributed via email. The electronic survey included questions from the EAT-26 and a nutritional knowledge questionnaire. Subjects were asked to complete an ASA-24 electronic 24-hour recall. Correlations were analyzed using a bivariate correlation and unpaired t-test with Service Product for Statistical Solution (SPSS). Results: EAT-26 scores averaged  $4.56 \pm 6.7$  indicating a low risk for an eating disorder ( $n=25$ ). Only one dancer indicated a high risk with an EAT-26 score of 31. There was a strong, though statistically insignificant, correlation between the EAT-26 score and nutritional knowledge ( $r=-0.307$ ,  $p=0.068$ ,  $n=25$ ). Participants ( $n=25$ ) scored, on average, 66% on the nutritional knowledge questionnaire; however, those who had taken a nutrition course scored significantly higher, 76% ( $t = 2.3695$ ,  $p = 0.0266$ ,  $df = 23$ ). Only 17

dancers completed the ASA-24. Participants consumed 1747 +/- 630 kcals, including 61.5 +/- 26g protein, 70.7 +/- 34 g fat, and 216.7 +/- 71g carbohydrates, in a 24-hour period. Dancers consumed an inadequate amount of calcium (47%), vitamin C (71%), vitamin B6 (47%), iron (94%), and vitamin D (100%) (n = 17). Conclusion: while overall diets appeared to meet most RDA recommendations, intakes varied extremely and 41% failed to obtain at least 50% of the RDA for more than one nutrient. Improving nutritional knowledge and healthy food choices could decrease eating disorder risk in DIII collegiate dancers.

(1) Doyle-Lucas, A. F., & Davy, B. M. (2011). Development and evaluation of an education intervention program for pre-professional adolescent ballet dancers: Nutrition for optimal performance. *Journal of Dance Medicine & Science*, 15(2), 65-75.

**Kemnic:** The “freshman 15” refers to the 15 lbs a student gains during the first year of college. While little, if any evidence supports 15 lbs, two-thirds of first year students gain weight to some degree. Purpose: To determine whether weight gain occurs, whether there are differences by gender, and to identify the factors that may contribute to weight gain during the first semester of college. Methods: Institutional Review Board approval and informed consent forms were received prior to beginning research. Students had to be 18 or 19 years of age and in the first year at a university; transfer students were not eligible. In this prospective study, baseline measurements of 43 male and 27 female first year students were conducted in September and October. Follow-up measurements for the continuing 10 male and 10 female participants were taken at the beginning of January. Participants took a survey addressing perceptions of the “freshman 15,” anthropometric and body composition measurements were assessed using the QuadScan 4000, physical activity using the Paffenbarger Physical Activity Questionnaire, and diet using the Automated, Self-Administered 24-hour dietary recall. Repeated measures analysis of variance (ANOVA) was used to determine changes in anthropometric and body composition measurements, and patterns of physical activity. A p value of < 0.05 was considered statistically significant. Results: Sixty-five percent of participants (6 females, 7 males) gained weight after one semester of college regardless of intent for weight change. Weight gain was non-significant for males (T1: 173.6 ± 30.9 lbs, T2: 175.2 ± 33.5 lbs) and females (T1: 133.8 ± 16.8 lbs, T2: 134.8 ± 17.3 lbs). The percentage of overweight BMIs decreased from 42% to 40% in females and increased from 41% to 50% in males. Non-significant gains for males and females in percent body fat (male 1.86%, females 2.03%), height (males T1: 70.3 ± 2.9 in, T2: 70.4 ± 3.1 in, females T1: 63.9 ± 1.7 in T2: 64.1 ± 1.6 in, percent lean muscle mass (males T1: 90.1 ± 5.1%, T2: 88.7 ± 5.3%, females T1: 77.5 ± 5.6%, T2: 75.8 ± 5.2%), and waist circumference (males T1: 32.3 ± 2.7 in, T2: 32.2 ± 2.7 in, females T1: 28.6 ± 2.5 in, T2: 28.4 ± 2.2 in). Hip circumference for males significantly increased (T1: 37.7 ± 4.1 in, T2: 40.2 ± 3.5 in) (p=.001). Physical activity did not significantly change and dietary intake could not be assessed due

to incompleteness of the ASA-24. Conclusion: The majority of males (70%) and females (60%) did gain weight but only 1 pound on average, not 15. Lean body mass, fat mass, waist circumference, and height did not significantly increase for males and females. Only one female classified as overweight for percent body fat (31.6%) and BMI (25), but end measurements did not vary from initial measurements. Although overweight BMIs increased for males, body fat percentages remained normal and percent muscle mass increased for 20% of participants. Average body fat percentages for males (11.3%) and females (25.5%) remained within normal ranges.

**Wenner:** Individuals who regularly exercise appear to be at higher risk for developing dental caries and erosion (1). Many believe the low pH of sports drinks (typically between 3 and 4) causes saliva pH decrease below 5.5, which results in dental erosion. However, beverage consumption during exercise can maintain hydration status and salivary flow rate which can help protect teeth. Purpose: To observe the effects of water and sports drink consumption on salivary pH during exercise in college-aged students. Methods: Approval was obtained by the Institutional Review Board, and all participants signed an informed consent form prior to testing. Results were analyzed using SPSS. Ten healthy, recreationally active college students participated in three 30 minute exercise sessions on separate days. Specific gravity was measured before each exercise session using a refractometer to ensure participants were adequately hydrated. Exercise sessions consisted of cycling on an ergometer at 70%-85% of the participant's maximal heart rate. Participants were randomly assigned to one of three treatments (no beverage, water, or Gatorade) and consumed 80 mL of their designated drink every 10 minutes during the continuous exercise session. Beverage consumption occurred after 5, 15, and 25 minutes, and saliva pH was tested occurred after 0, 10, 20, 30 minutes, and 10 minutes post-exercise using Hydrion™ Urine and Saliva pH paper. Results: Saliva pH increased by 0.165 with no beverage consumption, decreased by 0.08 with the water treatment, and decreased by 0.26 with the Gatorade treatment. None of the treatment groups were significantly different after the 30 minute exercise session (two-way ANOVA,  $p=0.057$ ). However, initial pH values were different from each other among the three treatments, so saliva pH was standardized by converting pH to change scores. The change score of Gatorade was significantly different from the control at the end of the exercise session (post-hoc LSD,  $p=0.018$ ). Conclusions: Saliva pH never dropped below the critical value of 5.5, indicating a minimal risk for erosion. Sports drinks can help maintain adequate hydration status, which can increase saliva output and oral buffering capacity, perhaps minimizing saliva pH change. Exercise or hydration status may change the composition of saliva, and method of saliva collection may yield different results.

#### Resources

1. Mulic, A., Tveit, A. B., Songe, D., Sivertsen, H., & Skaare, A. B. (2012). Dental erosive wear and salivary flow rate in physically active young adults. *BioMed Central Oral Health*, 12(8), 1-8. doi:10.1186/1472-6831-12-8.

**Yang:** Technology can make life more convenient but can also lead to unhealthy behaviors. College students are major consumers of technology and excessive technology usage may be associated with more sedentary behaviors and poorer dietary choices. Purpose: To examine the correlations between technology usage, with diet, sleep, physical activity and academic performance in college students. Methods: The Institutional Review Board approved this research and 297 college students completed a survey that asked about their technology usage, diet, sleep, physical activity, body mass index (BMI), and grade point average (GPA). The majority of the participants were female (78%, N=231) and evenly distributed among years in college. The survey was sent via email and the first page of the survey consisted of the informed consent, consent was implied when the participant continued with the survey. Correlations between technology usage and health behaviors were determined with SPSS. Results: Out of the devices, TV, desktop computer, laptop, mobile phone, iPod, tablet, and mp3 player, the most used devices were mobile phone and computer. Computers and internet usage averaged nine hours a day. BMI (mean= 24.1, range 12.9, 40.1) was positively correlated with technology usage, in particular T.V. (p value =0.002), computer (p value =0.035), and internet (p value=0.034). GPA (mean=3.4, range 2.0, 4.0) negatively correlated with the technology usage, in particular mobile phone (p value=0.001), T.V (p value=0.001), internet (p value=0.001) and social media (p value=0.001). The use of technology was associated with consuming less than the recommended number of servings from dairy, fruits, vegetables and grains but positively correlated with sweeten beverages (p value=0.001). Conclusion: College students should be cautious of the number of hours spent using technology because technology usage appears to come with a price, not improved academic performance but poorer grades, higher body weights, and less nutritious diets. College students need to be aware that technology can adversely influence their health and academic performance.

**Wagner:** Dental caries represent the most widespread disease in humans with 91% of United States' adults aged 20-64 experiencing at least one cavity in a permanent tooth (CDC). Xylitol, a five-carbon sugar polyol, is an FDA approved sweetener used as a sugar substitute in chewing gum. Xylitol inhibits *S. mutans* growth and decreases adhesion of plaque to teeth when chewed in gum. Purpose. To determine if xylitol chewing gum decreases cariogenic bacteria in college-aged students. The importance of this work is to investigate the potential of xylitol chewing gum as a preventative measure against caries. Methods. Institutional Review Board Approval was received for this cross-sectional research study. Education majors aged 18-22 years old (N=30) were recruited and completed informed consents. An adaption of The World Health Organization: Oral Health Questionnaire for Adults survey was completed to assess oral health practices of subjects. Participants were randomly assigned to the xylitol, sorbitol, or control group with ten subjects in each group. The CariScreen Caries Susceptibility Meter was used to determine cariogenic bacteria population via ATP bioluminescence. Light intensity revealed through ATP

bioluminescence is equivalent to ATP concentration and reflective of cariogenic bacteria concentration within the mouth. Baseline ATP concentration were measured with the CariScreen Caries Susceptibility Meter. Students chewed gum for twenty minutes for ten days excluding one weekend. ATP measurements were collected following twenty minutes of chewing gum on day ten. A paired t-test was used to compare changes within treatment groups. The SAS system was utilized to run an ANOVA to test for significant differences between treatment groups. Results. The ATP concentration, reflective of cariogenic bacteria concentration, trended toward significance as there was a 30% decrease in the xylitol gum group, with a  $2436 \pm 2638$  (mean + SD) concentration at baseline and  $1697 \pm 1963$  bacterial count after ten days ( $p=0.094$ ). There was no significant change in ATP concentration in the sorbitol chewing gum group (baseline =  $1557 \pm 1845$ , ten day =  $1244 \pm 1673$ ) ( $p=0.69$ ). There was also no significant change in ATP concentration in the control group (baseline =  $1516 \pm 1689$ , ten day =  $1960 \pm 1995$ ) ( $p=0.29$ ). A score under 1500 indicates a healthy mouth while a score higher than 1500 signifies heightened risk of caries development.

Conclusions. Individuals in the xylitol group experienced greater attenuation of possible cariogenic bacteria after 10 days of treatment than those in the sorbitol or control group. While only the sorbitol group had an ATP concentration of below 1500 after treatment, the decrease in ATP concentration post treatment in the xylitol group was near the 1500 benchmark. Chewing gum with sugar substitutes like xylitol or sorbitol could provide the potential to decrease cariogenic bacteria population.

**Cherne:** Risk factors for cardiovascular disease (CVD) including dyslipidemia and hypertension can develop in adolescence and increase risk of CVD in adulthood. Improved blood pressure and lipid profiles are associated with higher dietary calcium intake in older adults, but limited data exists in young adults. Purpose: Determine the relationship between dietary calcium intake and CVD risk factors in a college-age population. Methods: IRB approval was obtained. Fasting blood samples were collected from 149 college students ages 18-24. Serum total cholesterol (TC), LDL, HDL, and triacylglycerol (TG) concentrations were measured using a LDX Cholestech machine, blood glucose using a Precision Xtra glucometer, and blood pressure (systolic [SBP] and diastolic [DBP]) using an Omron automated sphygmomanometer. Dietary calcium intake was assessed using the Brief Calcium Assessment Tool (BCAT) (1). Correlation between CVD risk factors and dietary calcium was determined. Unpaired t-tests determined differences between sexes. Results: Average daily dietary calcium intake was 804 mg (RDA for 18 year olds: 1300mg, 19-50 year olds: 1000mg). Mean calcium intake was 186 mg lower in females than males ( $p=0.001$ ). Acceptable TC, LDL, and TG concentrations occurred in 85%, 92%, and 75% of total participants respectively based on guidelines for 20-24 year olds (2). HDL concentrations were normal 75% of participants and SBP and DBP were normal in 84% and 87% of subjects, respectively. Mean HDL was lower in males than in females ( $p=0.001$ ). Mean SBP was higher in males than females

( $p=0.000$ ). TGs were positively correlated with dietary calcium intake ( $r=0.221$ ,  $p=0.010$ ). Conclusions: Average dietary calcium intake in college students is below recommendations and over half (56%) consumed less than 1000mg and 29% consumed less than 400mg. The majority of participants fell within normal ranges for lab values. Education about meeting dietary calcium recommendations may be warranted in a college-age population. The positive correlation between dietary calcium and TGs was unexpected and may be attributed to the calcium sources and the relatively small sample size.

1. Yang, Y.J., Martin, B.R., Boushey, C.J. (2010). Development and Evaluation of a Brief Calcium Assessment Tool for Adolescents. *Journal of the American Dietetic Association*, 110(1), 111-115. Doi: 10.1016/j.jada.2009.10.009.

2. Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents. (2011). Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents: Summary Report. *Pediatrics*, 128(5), S213-s256. Doi: 10.1542/peds.2009-2107c.

## Physics

### Schedule

*9:30 - 10:00 AM*

*PEngl 167*

Gabriel Hanson (Todd Johnson, John Adam Whitten, Physics) Synthesis and analysis of Tin-based Perovskite Solar Cells

*10:00 - 10:30 AM*

*PEngl 167*

Alex Wheeler (John Adam Whitten, Physics) Thermoacoustic Refrigeration

*10:30 - 11:00 AM*

*PEngl 167*

Caleb A. Thiels (Sarah Yost, Physics) Stability in Long-Period Mira Variable Stars

*11:00 - 11:30 AM*

*PEngl 167*

Stephanie Bierman (Thomas Kirkman, Physics) Swimming Flip Turns

*11:30 - 12:00 PM*

*PEngl 167*

Kyle Gag (Todd Johnson, Physics) Study on near-field patterns of Yagi-Uda antennas

### Abstracts

**Hanson:** Due to rising global energy demands and the threat of climate change, a shift towards renewable energy will be necessary in the near future. Solar energy, a clean and abundant solution to the world's energy problems, could be the power of the future, but first the associated costs of solar energy generation must be competitive with fossil fuels. Thin film perovskite solar cells (PSCs) are a new technology with promising characteristics. Although cheap and efficient, stability and toxicity issues within PSCs remain. In this experiment, thin film PSCs were synthesized through the deposition of  $\text{CH}_3\text{NH}_3\text{SnI}_3$  perovskite onto indium tin oxide glass, followed by a layer of Spiro MeO-TAD, a large organic hole transporting material (HTM) with a high affinity for positively charged holes. Cells were synthesized within a dry nitrogen glove box and sealed before exposure to atmospheric conditions. Once sealed, the cells were characterized using scanning electron microscopy, optical microscopy, and solar simulation. Over the course of the research, completed cells showed promising improvements in the generation of photovoltages, but due to irregular crystal growth and imprecise layer thicknesses no photocurrent was produced by the cells.

**Wheeler:** Thermoacoustic refrigeration is an alternative method of completing the task that common household refrigerators do every day. The process involves using sound from a speaker to pump heat across a medium, creating a cold reservoir and a hot reservoir. This medium, which is called a stack, is placed inside a tube that has one end closed and the speaker playing sound at the resonant frequency of the tube at the open end. Such an apparatus was constructed by creating a stack out of fishing line held in place by super glue on a roll of camera film. This was placed in a PVC pipe which was closed at one end with an aluminum plug. By playing sound through a speaker at approximately 300 hertz, a maximum temperature gradient of several degrees Celsius was achieved across the stack over the course of 10 minutes. This result demonstrated the potential to cool air using sound rather than a coolant.

**Thiegs:** Mira stars are long period variable stars whose luminosity varies by factors of approximately 100 with periods between 100 and 1000 days. Some Mira variable stars exhibit fluctuations between periods, which suggests they may be semi-regular Miras. Real lightcurves for Mira stars were gathered from public databases containing 8 years of ongoing data. Fitting through Fourier series and statistical analysis were integrated to study the recently released data. A Monte Carlo method of resampling was used to determine how precise the fits were. The stars were then compared to the number of stars that were tagged as semi-regular by the SIMBAD Astronomical Database. Only 12 percent of the stars were good matches that corresponded with their reference period. However, not all of the other 88 percent clearly indicate semiregularity. Poor fits to the folded lightcurves explain some of the discrepancy. Yet, this still suggests that there may be a greater portion of semi-regular Mira variable stars than previously believed.

**Bierman:** The aim of this study was to identify the elements of a swimming flip turn that produce the fastest turn. Using an underwater camera and video analysis, the following variables were studied: total turn time, feet position on the wall, distance from the wall where the swimmer began his/her turn, maximum depth, initial velocity of the wall, height, weight, and sex. These variables were measured in both shallow and deep end turns. Many statistically significant correlations were found, but none convincingly provided a standard for what makes a flip turn fast. An old controversy (“Are flip turns faster in the deep end compared to the shallow end?”) could not be resolved in this study. Nevertheless, this study is helpful in suggesting which variables deserve further consideration in studies of the flip turn.

**Gag:** This study aimed to use Software-defined radio to investigate the near-field patterns of Yagi-Uda antennas. To do this two Yagi-Uda antennas with dipole antennas as driven elements were designed. Software-defined radio was used to measure the amplitude of the signals detected by these antennas. The effects of each antenna element on the gain of the signal were observed. The angle dependence of both the Yagi-Uda antennas and the dipole antennas was observed.



## **Social Sciences Presentations:**

### **Accounting & Finance**

#### **Schedule**

*9:40 - 10:00 AM*

*Simns 340*

Brent Huhn (Warren Bostrom, Accounting & Finance)  
Compensation in Accounting

*10:00 - 10:20 AM*

*Simns 340*

Connor W. Reilly (Warren Bostrom, Accounting & Finance) Does CEO Stock Ownership Affect Company Performance

*10:00 - 10:20 AM*

*Simns 330*

Joash Boyd (Warren Bostrom, Accounting & Finance)  
Political Corruption and it's effects on socioeconomic factors in Jamaica

*10:00 - 10:20 AM*

*Simns 310*

Austin Tausk (Warren Bostrom, Accounting & Finance) Taxes: How Hard Salary Caps are Unfair in Professional Sports

*10:20 - 10:40 AM*

*Simns 340*

Joseph Nolan (Warren Bostrom, Accounting & Finance) Labor Issues - The Skills Gap

*10:20 - 10:40 AM*

*Simns 330*

Samuel Perner (Warren Bostrom, Accounting & Finance) Marijuana Legalization in Minnesota

*10:20 - 10:40 AM*

*Simns 310*

Benjamin A. Lahren (Warren Bostrom, Accounting & Finance) Relationship between athletic performance and player contracts

*10:40 - 11:00 AM*

*Simns 330*

Taylor C. McAlpine (Warren Bostrom, Accounting & Finance) The Effect of Increasing Minimum Wage on Welfare Spending

*10:40 - 11:00 AM*

*Simns 310*

Jabari N. Wilmott (Warren Bostrom, Accounting & Finance) Financial Planning for Professional Athletes

- 10:40 - 11:00 AM*  
*Simns 340* Zachary W. Hnath (Warren Bostrom, Accounting & Finance) Women CEO Compensation
- 11:00 - 11:20 AM*  
*Simns 330* Andrew Kuhl (Warren Bostrom, Accounting & Finance) Political Campaign Financing: How do inter-Super PAC relationships impact efficiency ratios?
- 11:00 - 11:20 AM*  
*Simns 340* Matthew Hajostek (Warren Bostrom, Accounting & Finance) Equal Pay for Equal Play
- 11:00 - 11:20 AM*  
*Simns 310* Samuel Sura (Warren Bostrom, Accounting & Finance) Benefits/Shortfalls of hosting the Olympics
- 11:30 - 11:50 AM*  
*Simns 330* Kevin J. Keller (Warren Bostrom, Accounting & Finance) Initial Public Offerings (IPOs)
- 11:30 - 11:50 AM*  
*Simns 310* Jacob T. Margarit (Warren Bostrom, Accounting & Finance) Financial Impact of Tax Return Fraud and Identity Theft
- 11:30 - 11:50 AM*  
*Simns 340* Samantha Vine (Warren Bostrom, Accounting & Finance) The Importance of PTO
- 11:50 - 12:10 PM*  
*Simns 340* Benjamin Walter (Warren Bostrom, Accounting & Finance) Is the CPA exam worth my time?
- 11:50 - 12:10 PM*  
*Simns 330* Logan R. Hershey (Warren Bostrom, Accounting & Finance) 401(k) Plans: Destabilizing the Retirement Industry
- 11:50 - 12:10 PM*  
*Simns 310* Katherine A. Budin (Warren Bostrom, Accounting & Finance) Attractiveness of United States Corporate Tax

## **Abstracts**

**Huhn:** I will be presenting information pertaining to compensation among different areas in the accounting profession.

**Reilly:** My presentation will be analyzing if in fact CEO's who hold more stock in their company seem to have a positive affect on their company's performance and the correlation between those factors.

**Boyd:** I will be examining political corruption's effect on socioeconomic factors such as the unemployment rate, GDP per capita, and the GDP growth rate. Additionally, I will be attempting to highlight the specific factors that contribute to the difference in GDP growth rate of Jamaica compared to the world.

**Tausk:** This presentation examines the effects of income taxes on salary caps in professional sports. It illustrates the many hoops athletes go through collecting their salary. High taxes may affect athletes' decisions on where to play and professional sports organizations as a whole. The question is, are hard salary caps unfair?

**Nolan:** I am looking into the skills gap to see which professions the gap is worst in and what is causing those jobs to have a larger gap.

**Pelner:** I will be looking at the effects that legalization of marijuana could have on the economy in Minnesota.

**Lahren:** An analysis of the relationship between athletic performance and the amount of guaranteed money in an NFL player's contract.

**McAlpine:** This project is looking at a correlation between increasing minimum wage by state and its effect on welfare spending in each state. It also takes into consideration state unemployment and GDP's effect on welfare spending.

**Wilmott:** In this research, I plan to explore and breakdown the different factors that contributes to the success and failure of athletes financial stability throughout their careers and post-retirement.

**Hnath:** Evaluating women CEO compensation versus their male competitors, looking for any inequalities in respect to performance indicators.

**Kuhl:** Considering the election year that is upon us, I thought it was appropriate to research political campaign financing. super-PACs (political action committees) are a material in candidates' campaigns, and I analyzed super-PAC activity in the 2010, 2012, and 2014 election cycles. I examined their donation metrics and sought correlations between these figures and their efficiency ratios.

**Hajostek:** How is the compensation of female athletes changing over time compared to their male counterparts?

**Sura:** I take a statistical look at how the Olympics affect the host country.

**Keller:** My research consists of a large sample size of returns of initial public offerings - from the first day through the end of its first year. Initial public offerings may seem enticing to invest in, but one may not realize the volatility, risk, and other factors that are associated with IPOs.

**Margarit:** I have analyzed the amount of refunds paid out for false tax returns over the past several years. Compared that with the increase of e-filing for tax returns, along with a decreasing IRS budget to help fight the problem.

**Vine:** This presentation discusses the importance of paid time off for employees. It takes a deeper look at the impact PTO has on an employee's happiness and productivity.

**Walter:** This is a research study that looks into the CPA certification and the difference it can make in an accounting career.

**Hershey:** For my research, I explored the macroeconomic implications of 401(k) retirement plans. My research involved examining whether 401(k) plan contributions artificially inflate the market.

**Budin:** Potential ways the United States could change tax policies to become more attractive to companies.

## Peace Studies

### Schedule

8:30 - 8:40 AM

*Simns 360*

Theresa Farrell (Jeffrey Anderson, Peace Studies)  
International Volunteering: Stories of Success, Failure,  
and Learning: PCST Capstone

8:40 - 8:50 AM

*Simns 360*

Hannah Houts (Jeffrey Anderson, Peace Studies) The  
Impact of Paolo Freire in the United States: PCST  
Capstone

8:50 - 9:00 AM

*Simns 360*

Matthew Gee (Jeffrey Anderson, Peace Studies) Goals,  
Gold Medals and Glory: A Brief Examination into the  
Developmental Effects of World Sporting Events in  
Brazil - PCST Capstone

9:00 - 9:10 AM  
*Simns 360*

Abby Baggenstoss (Jeffrey Anderson, Peace Studies)  
The Many Disadvantages Gentrification Has on Small  
Businesses: PCST Capstone

9:10 - 9:20 AM  
*Simns 360*

Brianna Miller (Jeffrey Anderson, Peace Studies)  
Development and the Struggle of Indian Farmers:  
PCST Capstone

9:20 - 9:30 AM  
*Simns 360*

Sachal Jacob (Jeffrey Anderson, Peace Studies) Debt  
Bondage: Parallels between bonded brick kiln workers  
and minimum wage sweatshop workers: PCST  
Capstone

9:30 - 9:40 AM  
*Simns 360*

Frida Alvarez (Jeffrey Anderson, Peace Studies)  
Latinx's in Redevelopment

9:40 - 9:50 AM  
*Simns 360*

Sean Donohue (Jeffrey Anderson, Peace Studies)  
Redefining Masculinity: PCST Capstone

9:50 - 10:00 AM  
*Simns 360*

Mia McVicker (Jeffrey Anderson, Peace Studies) The  
Politics of Motherhood: Trends in Adolescent  
Childbearing in Southern Africa: PCST Capstone

## **Abstracts**

**Farrell:** This presentation will explore the history of international volunteering and service and its impact on both the host communities as well as the volunteer. "Voluntourism," service-oriented gap years, and both short- and long-term international volunteer options have become popular opportunities for young people to travel and experience new cultures while giving back and making what many believe is a positive difference in the world. However, many scholars, community members, and volunteers themselves have identified serious flaws in the practice of international service, and focus on the negative implications of this model of development. This presentation will discuss the scholarly research on the effects of international volunteering on the host nations, the individual communities where foreigners serve, and the volunteer. Qualitative interviews with students from CSB/SJU and the presenter's personal experiences and anecdotes demonstrate some of the positive and negative issues that the scholarship on volunteering abroad identifies. The presentation will conclude

with a discussion of some current best practices for those who are volunteering and serving abroad.

**Houts:** The work of Paolo Freire has had enormous impact in reframing and exploring issues ranging from literacy and teaching, to peace education and youth activism. This presentation will explore the impact of Freire's work in the U.S and attempts to recreate his ideals of critical pedagogy and conscience-ness in youth programming. Specifically, it will address peace education programming in U.S middle and high schools and identify common goals and themes inspired by Friere's work seen in this type of programming. These goals include awareness of self, community, and world as well as the creation of equal spaces where youth and adult teachers are able to open dialogue and reflect on issues at school and within the community. Finally, these common goals and themes will be applied and compared to programming currently being implemented in the St. Cloud School District, including the Take Ten high school program and efforts to organize restorative circle processes in local middle schools.

**Gee:** Brazilian politicians and much of the public rejoiced when the country won the bids for both the 2014 World Cup and 2016 Olympics. They would be an opportunity to show the world how far they have come and to demonstrate to the world that Brazil has "made it". On the eve of the 2016 Summer Olympics, instead of focusing on finishing the final details of preparation, the country is consumed in turmoil. The country's recent economic downturn, recent findings of corruption at the highest levels of government, and the underlying structural issues posed by rampant economic inequality have sent millions and millions pouring into the streets to protest. Against this backdrop, I will briefly detail the economic, social and environmental effects of the World Cup and Olympics. I will then make the argument that these events, that promised great economic benefits and a world audience to showcase the country's progress, have actually had a generally negative effect on Brazil on all three of these levels.

**Baggenstoss:** When people hear the word gentrification many different thoughts come to mind. Some people claim it's beneficial for communities in and around city centers while others argue it's detrimental to not only the residents of those communities, but the economy as well. Although gentrification brings many positives into a neighborhood—lower crime rates, higher property value, and a booming economy—it tends to push out small, family run businesses in order to make way for the larger corporations. By analyzing gentrification in 2 major cities—New York and Minneapolis—as well as comparing it to my hometown of Albany, MN, I'm going to focus on the effects—both positives and negatives—that gentrification has on small businesses and their owners. Within those cities, I'm going to narrow my analysis to specific neighborhoods currently being gentrified and look at the amount of family owned businesses closing up shop or selling out, the number of large companies moving in, in addition to the small businesses that benefit from gentrification. By comparing my findings, I'll reach

a conclusion on whether or not gentrifying neighborhoods does more harm than good.

**Miller:** For farmers in India, Western-driven development has caused great hardship. Starvation, poverty, and suicide are just some of the struggles of Indian farmers. These hardships are mostly due to Western powers creating systems that mainly benefit the West. When the British colonized India, they set up a system of hierarchy. In this system, the lands that were distributed amongst villagers were all given to a British-appointed land owner. In order to farm the land that was taken from them, the villagers were forced to pay taxes. These taxes then benefited the British and made the farmers completely dependent on the land-owners (which kept the farmers in a vicious cycle of poverty). However, the British, who were the ones benefiting from the agreement, claimed that the benefit was mutual. Although the term "development" didn't evolve until later in history, they essentially claimed that they were helping India develop. Today, the ancestors of these landowners still collect revenue from farmers who work their land. However, there are new, additional issues being faced in today's modern world. Many families are now leaving their ancestral land and moving to cities in order to earn more money and receive educational opportunities for their children. Because of this and the growing population of India, fewer farmers are forced to grow more crops. Now, many farmers are also dependent on pesticides, herbicides, and genetically modified seeds from abroad to grow the amount of food that the country needs. Large Seed companies from the West push farmers into buying their product and claim that their company is "feeding the world." In order to keep farming the seeds, the farmers must keep buying seeds from these companies to avoid a law suit. This creates dependence and even greater poverty (especially when the crop fails). The chemicals used in farming often get into the water systems and poison residents. Because of the debilitating poverty, farmers are often encouraged to drink chemicals as a means of paying off their debts to the land owners.

**Jacob:** Debt Bondage or Bonded Labor is one of the few remaining vestiges of slavery in the world today. The brick kiln industry (my primary focus) of South Asia works through indebting workers by paying them very little and through giving the laborers just enough so that they may survive. Various problems can flow from this; child labor is somewhat common as the debt owed by parents can be passed on to the children, workers endure harsh conditions and a host of health problems, and laborers struggle to find access to market because of these systems. Sweatshop workers have several commonalities with these bonded laborers, where they are dependent on a system that barely lets them survive, also face terrible working conditions and are stuck in a cycle of poverty. Although the conditions of the laborers may be quite similar, the two industries could not be more different. Brick kilns are a largely un-regulated industry and the produced bricks mostly go toward local projects so it is hard to have any international oversight over these. Although there are laws against it, bonded labor goes largely unchecked due to issues ranging from regulatory limitations to lack of

education. Sweatshop labor on the other hand has been on the public's radar for a while, and there have even been attempts to regulate it by establishing international standards. My paper focuses on these two industries and takes lessons from the clothing industry to envision and implement better conditions for brick kiln workers but also other bonded laborers.

**Alvarez:** Latinx's involved in redevelopment has often been a struggle. Redevelopment in neighborhoods that are predominately Latinx, people coming in to redevelop are often seen by residents as another form of gentrification or the continuation of their marginalization. Contractors say that they're considering all angles, but many residents continue to feel shut out and ignored in the process. When Latinx's are participants in redevelopment there tends to want to be a focus around the culture and identify to keep it alive. When asked to participate people are eager to be involved to ensure that their community is listened to, their ideas are respected, and that their wants and needs are met. Community involvement is important to successful redevelopment in Latinx communities.

**Donohue:** For my term project I choose to focus on the development of masculinities through the 20th and 21st century. I choose to focus on what the typical roles of men were/ are in society and how these roles are becoming more and more outdated as we progress through time. I also look at unconventional masculinities and ideals within men that were once frowned upon, but are now becoming the norm for men in society. In my studies I have found how various elements such as, living conditions, social upbringings, and expendability in war affect the development of masculinity in boys as they grow into men.

**McVicker:** As in many other parts of the world, the African continent is experiencing a dramatic shift in traditional gender roles and reproductive norms. In an effort to promote these feminist reforms, international development and demographic organizations have brought adolescent childbearing (teen pregnancy) to the forefront of maternal and child health concerns. While well-intentioned, progressive policies such as South Africa's Choice on Termination of Pregnancy Act, which promoted safe and legal abortions, and Uganda's Defilement Law, which raised the legal age of sexual consent from 14 to 18, have inadvertently reinforced patriarchal gender norms and degraded traditional parenting techniques. This presentation will discuss the influence of these culturally misguided development policies on maternal health, adolescent parenting, and the institution of motherhood. Through this research, I hope to gain deeper insight into the relative benefits and risks of development programs concerning adolescent childbearing.

## **Political Science**

### **Schedule**

*8:30 - 8:45 AM*



*Gorec 120* Katherine Hockman (James Read, Political Science)  
U.S. Foreign Policy and the South China Sea Conflict

*8:45 - 9:00 AM*  
*Gorec 120* Mary Catherine Steenberge (James Read, Political  
Science) Farmer Field Schools in Senegal

*9:00 - 9:15 AM*  
*Gorec 120* Nick Rethemeier (James Read, Political Science) De-  
Escalating Tensions between United States and Russia

*9:15 - 9:30 AM*  
*Gorec 120* Charles Pults (James Read, Political Science)  
Comprehensive Immigration Reform and a Path to  
Citizenship

*9:30 - 9:45 AM*  
*Gorec 120* Hanna Pioske (James Read, Political Science)  
Expanding Immigration Work Visas

*9:45 - 10:00 AM*  
*Gorec 120* Daniela Mejia (James Read, Political Science)  
Removing Criminal Penalties for Victims of Sex  
Trafficking

*10:00 - 10:15 AM*  
*Gorec 120* Courtney Miller (James Read, Political Science)  
Lowering the Cost of Prescription Drugs in the United  
States

*10:15 - 10:30 AM*  
*Gorec 120* Danny Gillis (James Read, Political Science) Closing  
the Achievement Gap in Head Start

*10:30 - 10:45 AM*  
*Gorec 120* Ellen Stensrud (James Read, Political Science) STEM  
Education and Climate Change

*10:45 - 11:00 AM*  
*Gorec 120* Meredith Jarchow (James Read, Political Science)  
Expanding the Challenge Incarceration Program in  
Wisconsin

*11:00 - 11:15 AM*  
*Gorec 120* Katrina Carney (James Read, Political Science) Haiti's  
Environment and U.S. Foreign Policy

*11:15 - 11:30 AM*  
*Gorec 120*

Taylor Kallsen (James Read, Political Science) Helping Homeless School Children in California

## **Abstracts**

**Hockman:** U.S. Foreign Policy and the South China Sea Conflict - Dr. Jim Read's POLS 114 - Public Policy Analysis students will diagnose a public policy problem and recommend a specific course of action to address that problem.

**Steenberge:** Farmer Field Schools in Senegal - Dr. Jim Read's POLS 114 - Public Policy Analysis students will diagnose a public policy problem and recommend a specific course of action to address that problem.

**Rethemeier:** De-Escalating Tensions between United States and Russia - Dr. Jim Rad's POLS 114 - Public Policy Analysis students will diagnose a public policy problem and recommend a specific course of action to address that problem.

**Pults:** Comprehensive Immigration Reform and a Path to Citizenship - Dr. Jim Rad's POLS 114 - Public Policy Analysis students will diagnose a public policy problem and recommend a specific course of action to address that problem.

**Pioske:** Expanding Immigration Work Visas - Dr. Jim Rad's POLS 114 - Public Policy Analysis students will diagnose a public policy problem and recommend a specific course of action to address that problem.

**Mejia:** Removing Criminal Penalties for Victims of Sex Trafficking - Dr. Jim Read's POLS 114 - Public Policy Analysis students will diagnose a public policy problem and recommend a specific course of action to address that problem.

**Miller:** Lowering the Cost of Prescription Drugs in the United States - Dr. Jim Read's POLS 114 - Public Policy Analysis students will diagnose a public policy problem and recommend a specific course of action to address that problem.

**Gillis:** Closing the Achievement Gap in Head Start - Dr. Jim Read's POLS 114 - Public Policy Analysis students will diagnose a public policy problem and recommend a specific course of action to address that problem.

**Stensrud:** STEM Education and Climate Change - Dr. Jim Read's POLS 114 - Public Policy Analysis students will diagnose a public policy problem and recommend a specific course of action to address that problem.

**Jarchow:** Expanding the Challenge Incarceration Program in Wisconsin - Dr. Jim Read's POLS 114 - Public Policy Analysis students will diagnose a public

policy problem and recommend a specific course of action to address that problem.

**Carney:** Haiti's Environment and U.S. Foreign Policy - Dr. Jim Read's POLS 114 - Public Policy Analysis students will diagnose a public policy problem and recommend a specific course of action to address that problem.

**Kallsen:** Helping Homeless School Children in California - Dr. Jim Read's POLS 114 - Public Policy Analysis students will diagnose a public policy problem and recommend a specific course of action to address that problem.

## Psychology

### Schedule

*9:45 - 10:15 AM*  
*NewSc 140*

Jordan Barthel (Pamela Bacon, Psychology) Are Forgiving People Less Likely to Experience Cognitive Dissonance Induced Attitude Change?

*9:45 - 10:15 AM*  
*NewSc 146*

Samantha Womeldorf (Richard Wielkiewicz, Psychology) The Relationship between Athletic Identity and Stress Levels

*10:15 - 10:45 AM*  
*NewSc 146*

Shelby R. Weisen (Richard Wielkiewicz, Psychology) Relational-Interdependence and Life Transitions in College: Study Abroad, First-Year, and International Students

*10:15 - 10:45 AM*  
*NewSc 140*

Victoria L. Beach (Stephen Stelzner, Michael Livingston, Rodger Narloch, Psychology) Religiosity and Prayer In Relation to Health and Life Satisfaction In Older Adults

*10:45 - 11:15 AM*  
*NewSc 140*

Stephanie M. Besst (Pamela Bacon, Psychology) The Level of Relational Self-Construal Moderates the Relationship between Disclosure and Well-Being

### Abstracts

**Barthel:** Cognitive dissonance research has recently been focused on studying the relationship between individual differences and cognitive dissonance. The

purpose of the current study was to see if individuals with lower levels of dispositional forgiveness would experience more attitude change than those who have higher levels of dispositional forgiveness, as a result of cognitive dissonance being induced. Participants completed a boring task that involved moving beads back and forth on an abacus, and then were either asked or told to mislead the next participant by telling them that the task was enjoyable in order to induce cognitive dissonance in the participant. They were then asked to complete a questionnaire designed to measure their attitudes toward the abacus task. It was predicted that the participants with lower levels of dispositional forgiveness would end with more positive attitudes toward the abacus task than those with higher levels of dispositional forgiveness. The study did not yield any statistically significant results. The limitations of the study will be discussed.

**Womeldorf:** Participants from two private, Catholic, liberal arts institutions participated in an anonymous, voluntary survey sent as a link through campus-wide, student e-mail. The purpose of the survey was to uncover how Division III athletes identify themselves athletically, as well as uncover common stressors within this population, in contrast to the majority of previous research involving Division I and II student-athletes. The participants included 116 male and 186 female students. The results of the study had mixed consistency with the predictions. Overall, athletes reported lower levels of academic and daily stress, which was inconsistent with the predicted hypotheses and previous research. Athletes reported higher levels of athletic identity overall with increasing athletic identities for higher level athletes, which was consistent with the hypotheses. Males and females showed slight differences in GPA (females being higher, which was consistent with predicted hypotheses), but GPAs did not differ between athletes and non-athletes, which was inconsistent with the predicted hypotheses. As a large group and unrelated to being an athlete or not, males identified more strongly as athletes than females, which was also consistent with the predicted hypotheses and previous research in Division I and II athletes. The results of this study were consistent with previous results showing that the higher level athletes identify themselves more strongly as athletes, also consistent with Division I and II athletes. The present results were somewhat consistent with past research related to stress: Non-athletes indicated higher levels of stress than athletes, although non-athletes reported higher stress on the time pressure subscale, which is inconsistent with previous research which has indicated that athletes usually feel more pressure related to time commitments due to athletic activities.

**Weisen:** The current study examined the sojourner adjustment of U.S. college students studying abroad, international college students studying in the States, and first-year students adjusting to life in the first semester of their undergraduate career. An online survey was distributed to 412 college students; it included the Sojourner Adjustment Measure (SAM), the Lifelong Learning Scale (WielkLLS), the Relational-Interdependent Self-Construal Scale (RISC), the Brief HEXACO Inventory of personality, and the Social Media Use Integration

Scale (SMUIS). The purpose of the study was to explore the relationships among these major emerging adulthood transitions and various measures of adjustment to college. While higher scores on the SAM were found for upperclassmen and U.S. students having studied abroad, there was no significant relationship between SAM scores for international students versus others. Results suggest that students tend to report different levels of adjustment at various stages of their academic careers.

**Beach:** For my Honors Thesis, I chose to study the relationship between religiosity, prayer, life satisfaction, and health in adults aged 65-84. The United States is facing a rapidly growing elderly population. An important aspect of the aging experience is an individual's religious experience. This research project aimed to better understand the motivations behind religiosity (extrinsic or intrinsic) and a variety of different prayer behaviors as related to health and life satisfaction. This could have important implications for clinical practice and better understanding the aging experience.

**Besst:** The present study is a quasi-experiment studying whether the relational self-construal moderates the relationship between dyadic self-disclosure and well-being. It was hypothesized high relationals would experience higher well-being (higher happiness, self-esteem, positive affect, and life satisfaction, and lower negative affect and loneliness) in the closeness-generating condition than in the small-talk condition. Low relationals would experience lower well-being (lower happiness, self-esteem, positive affect, and life satisfaction, and higher negative affect and loneliness) in the closeness-generating condition than in the small-talk condition. Pairs of high or low relationals were randomly assigned to one of two disclosure conditions: closeness-generating or small-talk generating. After the conversation, participants completed well-being measures. Although no support was found for the hypotheses, high relationals rated themselves higher on happiness and positive affect than low relationals. It was also found that those in the closeness-generating condition had higher self-esteem and life satisfaction ratings than those in the small-talk condition.

## Interdisciplinary Presentations:

### Asian Studies

#### Schedule

*9:00 - 9:40 AM*

*HAB 102B*

Michelle Chang (Zhihui Geng, Asian Studies) Circle of Understanding and Gender Equity in the Hmong Community

*10:20 - 11:00 AM*

*HCC 102B*

Yue Pheng Lee (Zhihui Geng, Asian Studies) Hmong in Higher Education: Exploring higher education and Emerging Adult Hood Theory

*10:30 - 10:40 AM*

*HAB 117*

Elizabeth Berning (Limei Danzeisen, Asian Studies) Chinese Calligraphy

*10:50 - 11:00 AM*

*HAB 117*

Michael L. Hanna (Limei Danzeisen, Asian Studies) The Great Wall of China

#### Abstracts

**Chang:** My thesis focuses on how storytelling and circle processes are tools that give equal platform to all members of a community. For my project I asked family members to participate in a circle of understanding at home and did another one with Hmong students on the CSBSJU campus.

**Lee:** The first Hmong refugees arrived in the United States in 1975 after losing in alliance with the United States against the Communist Lao Government. Ever since then, the Hmong people have established a home in America. Over the past 40 years the Hmong have accomplished numerous achievements in America. Despite the achievements the Hmong community is still an ethnic group with the lowest percentage of graduation from higher education. Higher education expressing in particular bachelors or higher. An attempt to find out why the Hmong community is lacking in the pursuit of higher education, this paper will examine previous studies and introducing the Emerging Adult Hood Theory to potentially explain why the Hmong struggle to invest in higher education.

**Berning:** Learn about the ancient art form of Chinese Calligraphy. Experience the historical background, and the art form as it stands today.

**Hanna:** Perhaps one of the most recognizable wonders of the World is the Great Wall of China. The Great Wall of China is an enormous wall of fortifications composed of materials such as stone, brick, wood, and other materials. It was constructed along the northern borders of China. It was created in ancient times to protect the Chinese Empire from raids and invasions from mainly European invaders. Several walls were built approximately around 7 BC. Soon after the walls were merged together to form what we know today as the Great Wall of China. Though the Great Wall never really effectively prevented invaders from entering China, it came to function more as a psychological barrier between Chinese civilization and the world, and remains a powerful symbol of the country's enduring strength. It shows what people can accomplish when they come together for the greater good of the country.

## **Institute for Women's Leadership**

### **Schedule**

*10:00 - 11:00 AM*

*Gorec 204A*

Hannah Kosel, Zelda Wear, Breana Burggraff, Annie Dockendorf, Magnolia Ditzler, Maddie Barclay, Emily Webster, Jamie McCarthy, Amanda Price (Whitney Court, Institute for Women's Leadership) Political Confidence of the Students of the College of Saint Benedict and St. John's University

### **Abstracts**

**Kosel, Wear, Burggraff, Dockendorf, Ditzler, Barclay, Webster, McCarthy, Price:** We are the Hynes Scholars Cohort, which is a sophomore group that focuses on a yearlong exploration of leadership and gender issues. Due to the upcoming election, we chose to investigate the political involvement and confidence of CSBSJU students to determine if there is a difference between Bennies and Johnnies. An additional goal is to examine the correlation between campus involvement and political involvement. Our hypothesis is that although CSB students may be more involved, they will not be as politically confident as a result of performing a socialized gender. On the other hand, we expect SJU students may be less involved but will be more politically confident. We also expect to see an increase in political confidence between First Years and Senior students. Our research project consists of a survey that asks CSBSJU students about their current and future political involvement.

## **Sustainability**

### **Schedule**

*9:00 - 9:45 AM*

## **Abstracts**

**Russell:** One in nine people in the world does not have enough food to sustain a healthy lifestyle. In 2014, 151 of the 162 countries in the world were involved in some form of conflict. Nine hundred and five out of nearly 45,000 species assessed by the International Union for the Conservation of Nature have gone completely extinct and about 17,000 are considered endangered. According to NASA, the global temperature has increased by 1.4 degrees Fahrenheit since 1880 and global carbon dioxide levels are the highest they have been in 650,000 years. We live in a world filled with poverty, war, and an ecological system in distress, and these are only a few of the troubles that ail us. Just like many others, I want to make a positive difference in our world, yet when I look at the endless list of problems, I become overwhelmed and don't know where to start. Instead of feeling the weight of all of these issues simultaneously or picking and choosing which causes to fight for, what if I told you there was a different approach you could take? What if all of these problems were instead symptoms of a larger condition? Just like trying to combat the flu with cold medicine, this condition cannot be eliminated by attempting to fix each individual symptom. Instead, we must strive to eliminate the underlying disorder. Humans have lost touch with who we are and our interconnection to life as a whole. We live by the cultural story that says humans are separate from other humans and nature and that humans are naturally flawed, but this is just one story. By understanding the development of our civilized culture, we can write a new cultural story that will cultivate a sustainable existence of life into the future.



*Benedicta Arts Center Colman Theater, CSB*

**Theater**

Elliot Drolet, Brandon Bakken, Abby Baggenstoss, Olivia Stewart (Adam Houghton, Theater) Theater Senior Project Presentation

Senior Theater Majors talk about their research, preparation, rehearsal and performance of the play, Art by Yasmina Reza.

*Benedicta Arts Center FOG Gallery, CSB*

**Art**

Art B. 218, Art B. 318 (Andrea Shaker, Art) Computer Art Class Exhibit

Ault, Skyler J.  
Kelly, Macy N.  
Lomauro, Madeline L.  
Ryan, Casey J.  
Rymanowski, Graclyn A.  
Santos, Olivia T.  
Spengler, Kyle J.  
Theisen, Jordan P.  
Yang, Cham C.  
Zhang, Shuting  
Anderson, Lauren E.  
Ayodele, Christina O.  
Camarao, Makua  
Eli, Maggie C.  
He, Xinxin  
Hedin, Taylor N.  
Hughes, Sydney L.  
Lindemyer, Jessica J.  
Poster, Andrew L.  
Schoenherr, Kara B.  
Vogel, Jonathan M.  
Xiong, Mary  
Xiong, Ong

*Benedicta Arts Center Fog, Lounge, Courtyard, CSB*

**Art**

Art B. 119, Art B. 119 (Elaine Rutherford, Art) 3D/Drawing Class Exhibit

3D/Drawing Class members: Bernstein, Alexis R.  
Bruckbauer, Daniel J.  
Caspers, Rebecca A.

Cochran, Madeline R.  
Huebner, Justine M.  
Jungles, Alexis R.  
Juratovac, Susanne E.  
Lewi, Rediet Negede  
Moore, Heidi S.  
Nelson, Rachel L.  
Wagner, Miquela T.  
Wang, Zixu  
Wentworth, Alyssa C.  
Xu, Chaocheng

Art B. 215, Art B. 315 (Elaine Rutherford, Art) Painting Class Exhibit

Art 215/315 Painting Classes:

Barta, Megan A.  
Barton, Anna E.  
DeJong, Karina R.  
DuQue, Justin P.  
Goodman, Paige E.  
Kocourek, Jessica E.  
Liu, Shuang  
Martin, Zachary A.  
Meyer, Kenedy A.  
Stang, Isabella L.  
Tretter, Rachel M.  
Vang, Kabao  
Virnig, Raychel L.  
Weaver, Cole F.  
Conrad, Lian H.  
Daly, Megan M.  
Davis, Bridget M.  
Lyndgaard, Marian I.  
McAvey, Daniel B.  
McGrath, Emily F.  
Wilda, Christine B.  
Yin, Yanli  
Zhang, Shuting

Art B. 219, Art B. 319 (Samuel Johnson, Art) Ceramics Classes Exhibition

Art 219/319 Ceramics Classes:

Alvarez, Frida A.  
Anderson, Nathan L.  
Asleson, Kelsi L.  
Bondhus, April T.

Brooks, Justin S.  
Clay, Jonathan P.  
Effertz, Noah M.  
Eklund, Kenton E.  
Gallagher, Kailee S.  
Govern, Shannon M.  
Krukowski, Megan K.  
LaLuzerne, Emma J.  
Schmelzer, Amelia C.  
Schmelzer, Noah J.  
Urbanski, Tyler J.  
Vang, Ammie  
Vaughan, Daniel J.  
Alseth, Colton D.  
Barton, Anna E.  
Gruenhagen, Anthony R.  
Henle, Allen B.  
Jacobs, Kristen M.  
Keohen, Jane C.  
Mathison, James A.  
Mikolich, Madison N.  
Aanestad, Kimberly A.  
Charley, Angela M.  
Fritz, Mitchell J.  
He, Xinxin  
Leonard, Quinn A.  
Olson, Miranda L.  
Schmelzer, John W.  
Shannon-Tamrat, Selamawit E.  
Yanisch, Kristopher L.

*Gorecki Center 204, CSB*

### **Biochemistry**

Sarah Clark (Henry Jakubowski, Biochemistry) Effect of constitutive  $\alpha 1A$ -adrenergic receptor activation on gene expression of Notch1 and Nme1 in the adult female mouse brain

Norepinephrine (NE) is a catecholamine hormone and neurotransmitter that activates specific G protein-coupled receptors called adrenergic receptors (ARs). As a hormone, NE modulates the sympathetic nervous system's 'fight or flight' response. However, the role of NE as a neurotransmitter in the brain is less defined. It has been found that overactivation of the  $\alpha 1A$ -AR subtype decreases epilepsy, depression, and cancer as well as increases neurogenesis, longevity, mood, synaptic plasticity, and cognitive function in mouse models. In order to

investigate the effects of  $\alpha 1A$ -AR activation in the brain, the expression of the genes Notch1 and NME1 were studied. We hypothesized that both Notch1 and NME1 would be up-regulated due to their roles in regulating cell-fate determination and synthesis of GTP, respectively. RT-qPCR was used to evaluate and compare the expression of each gene between wild-type (WT) mice and constitutively active mutant (CAM)  $\alpha 1A$ -AR mice. The three regions of the brain that were studied were the hippocampus, cerebellum, and cerebrum. Initial findings were that Notch1 was significantly up-regulated ( $p < .05$ ) in CAM  $\alpha 1A$ -AR mice hippocampi and unaffected in other brain regions. There was no significant difference in NME1 expression between CAM  $\alpha 1A$ -AR mice and WT mice. This research was done at the University of North Dakota School of Medicine and Health Sciences under the direction of Dr. Van Doze as part of the NSF-REU program award number 1359243.

Scott Echternacht (Edward McIntee, Biochemistry) The efficacy and biochemical mechanism of treatment with intranasal insulin in the intracerebroventricular streptozotocin rat model of Alzheimer's disease

Research was conducted on the efficacy and biochemical mechanism of treatment with intranasal insulin in a pre-clinical model for Alzheimer's disease at the HealthPartners Center for Memory and Aging. The neurotoxic drug streptozotocin was used to induce a model of sporadic AD that is characterized by impaired brain glucose metabolism, oxidative damage, neuroinflammation, and functional memory loss. The goal of this study was to determine whether intranasally administered insulin may be a good treatment for functional memory loss in Alzheimer's disease, as well as test if the drug treatment protects brain glucose metabolism and decrease the oxidative damage and neuroinflammation that are induced in this model.

### **Center for Global Education**

Seamus Brannigan (Annika Turner, Center for Global Education) Northern Ireland to Minnesota

My project will talk about my experiences as a study abroad student coming from Queen's University in Northern Ireland. In the 10 months I have been here, I have become totally immersed in the American culture. This has opened up a huge amount of opportunities for me both in and out of the classroom which I am thankful for. In deciding to leave home and study abroad at CSBSJU, I set myself up for a huge challenge. Like all study abroad programs, it required me to move out of my comfort zone and embrace life when I got here. I am pleased to say I was able to take advantage of many of these opportunities through which I was able to learn a lot more about the American way of life, myself and even my own culture, as well as making many lifelong friends in the process. I

would like to talk about what I have learned and experienced during my time here.

Emily Tschida, Grace Vaughan, Patrick DeWitt (Annika Turner, Center for Global Education) South Africa Study Abroad Trip

The South Africa study abroad program is one of the unique programs that the College of Saint Benedict and St. John's University offers. This program immerses students in the culture while providing them with once in a lifetime opportunities but forever friendships. While in South Africa the group volunteers at three different services sites twice a week: Pendla Primary School, House of Resurrection, and Missionvale. We attended Nelson Mandela Metropolitan University while living in Port Elizabeth where our group became involved in many on campus activities such as volleyball, basketball, soccer, and choir. Port Elizabeth was our home for four months but we also got the opportunity to travel to many other cities in South Africa which provided us with a deeper understanding of their culture. The South Africa trip is a trip that changes people's lives. It is incomparable to any other experience you will ever have due to the immersion into what they are known as, the Rainbow Nation.

## **Chemistry**

Talitha Burtis, Sarai Seymour (Kate Graham, Edward McIntee, Chemistry) Size Exclusion Lab Development

The focus of this research is to develop new dipeptides for the CHEM 202 size exclusion lab at the College of Saint Benedict/ Saint John's University. The five currently used do not give students as challenging of an opportunity to develop their problem solving and data analysis skills as would a more extensive list of unknowns. New dipeptide candidates were chosen based on structural properties. For example, each dipeptide had to include a benzene ring in order to be detected by UV spectroscopy. This means that each dipeptide had to include either Phenylalanine, Tryptophan, or Tyrosine. A methyl esterification was done on each dipeptide (Phenylalanine-Phenylalanine, Glycine-Phenylalanine, Valine-Tyrosine, and Tyrosine-Alanine) which altered the polarity to allow the dipeptides to be tested with GC/MS and separated from bovine serum albumin via a size exclusion column. Dipeptides were analyzed using H1 and C13 NMR and GC spectroscopy. Two of the dipeptides, Phe-Phe-OMe and Gly-Phe-OMe, were able to be separated from BSA using a size exclusion column. They were also able to be characterized by GC/MS. Dipeptide methyl esters, Val-Tyr-OMe and Tyr-Ala-OMe, did not yield enough product to be tested on the size exclusion column. Expanding the list of dipeptides gives students more unknowns to decipher and find differences between

when analyzing results of their lab. This creates a better educational opportunity for students to advance their data analysis skills and problem solving techniques to be used for future laboratory experiments.

Taylor D. Graham, RoseMarina N. Armstrong (Brian Johnson, Annette Raigoza, Chemistry) synthesizing cuprous oxide nanocubes

Cuprous oxide nanocubes can be used as P-semiconductors in solar energy conversion. Because nanoparticles have a wide variety of applications and their properties are very dependent on the volume to surface area ratio, selectively synthesizing them in particular shapes and sizes is extremely important. Depending on the procedure used for synthesis, they can form in irregular shapes and sizes. So far there has not been adequate research on what contributes to the size and shape of the synthesized nanoparticles. It was predicted that concentration would have a significant impact on the formation of nanoparticles. To test this hypothesis, multiple experiments with varying concentrations of the reactants solutions were conducted and then tested for consistency of the product using DLS and SEM imaging. Results varied with irregular shapes and sizes that ranged from 60 nm to 1500 nm, with the average size around the desired 800 nm.

Hannah Holst (Christen Strollo Gordon, Chemistry) Calibration Determination Of Epoxides Using High-Performance Liquid Chromatography

Many atmospheric molecules, such as isoprene, are highly reactive in the environment. When these molecules react, they yield many byproducts, which react further to form complex structures containing numerous functional groups, including epoxides. Atmospheric epoxides are precursors to secondary organic aerosol (SOA) which can have implications for public health, the climate, cloud formation, air quality, visibility, and the oxidative capacity of the atmosphere. Little is known about atmospheric epoxides because they are highly reactive and exist in rather small concentrations. If effective and efficient methods can be developed to analyze epoxides in the atmosphere, the concentrations, implications, and chemical fate of these compounds can be more explicitly determined. Only after this understanding is in place, can steps be made to prevent or lessen their harmful effects. The focus of this research is to determine new methods of analyzing atmospheric epoxides by means of derivatization reactions of epoxides at various concentrations and interpretation via high-performance liquid chromatography (HPLC) using an isocratic method of 60% water and 40% acetonitrile. The data from the HPLC is then used to create calibration curves. Eventually, atmospheric samples can be collected and similar derivatization reactions and HPLC interpretation can be used to determine the concentration of epoxides that exist in the atmospheric

samples. The new methods look promising as calibration curves with R<sup>2</sup> values close to one have been obtained.

#### Stephanie Jean (Md Fazal, Chemistry) Analysis of the Interactions between Silver Nanoparticles and Bovine Serum Albumin

Nanoparticles are becoming more greatly integrated in our society. From applications such as delivering drugs to tumors, to the breakdown of oil into biodegradable compounds, their presence is growing. Their size makes them ideal for such tasks as well as the development of bio-nanotechnologies. Human interactions with nanoparticles has significantly increased over a short period of time. While there are some data on the negative health effects caused by nanoparticles, more research is still needed. Very little research has been done to study the interactions between nanoparticles and proteins using dynamic light scattering. This research aims to investigate the interactions between 100 nm silver nanoparticles and bovine serum albumin via dynamic light scattering. When proteins bind to the nanoparticle, the size of the protein corona increases. Preliminary results will be presented.

#### Destiny Johnson (Chris Schaller, Chemistry) A Building Block for Biodegradable Polymers

This project focused on transforming limonene, derived from citrus fruits, into a building block for biodegradable polymers using a thiol-ene reaction. The thiol-ene reaction is a photochemical process performed under UV light that results in the addition of sulfur to a carbon-carbon double bond. In this project, several thiols were assayed; in the most promising case, 2-mercaptopropionic acid was added to limonene to form a dicarboxylic acid. Nucleophilic substitution at both carboxyl groups could be used to enchain this unit into a polymer, such as polyurethane. Through methodological studies, we have investigated the use of different light sources, solvent, reagent concentrations, photoinitiators and photocatalysts. A separate investigation of optimal purification methods included column chromatography, recrystallization, solvent extraction, and filtration. This research promises to lead to polymers that can be produced with minimal impact on the environment.

#### Grace A. Lindquist (Alicia Peterson, Chemistry) Rh/Al<sub>2</sub>O<sub>3</sub> Catalyzed Hydrodechlorination of Trichloroethylene

The catalytic hydrodechlorination of trichloroethylene (TCE) yielding ethane gas is possible using a heterogeneous metal catalyst and hydrogen gas. TCE and other halogenated hydrocarbons are commonly used in industrial applications and yield chlorine-containing byproducts that lead to numerous environmental problems. Safe dehalogenation techniques

for of these compounds are needed. Palladium catalyst have been extensively studied and have been shown to be effective in dechlorination, but further research is required to find a more versatile alternative. The metal rhodium is believed to be as effective as other metals in dechlorination catalysts, but can also be used in other dehalogenation applications, such as defluorination. In this experiment, a Rhodium on Alumina catalyst was saturated with hydrogen gas and reacted with TCE. GC-FID data showed the catalyst successfully dechlorinated TCE, however, initially in the reaction the concentration of TCE increased as the ethane increased before eventually dissipating. The reason for this is not yet understood, and further research is being conducted to answer this question.

Grant Olsen, Alyson Welle (Workalemahu Berhanu, Henry Jakubowski, Chemistry) GROMACS simulation of LMW-PTP

#### Abstract

Low molecular weight protein tyrosine phosphatase (LMW-PTP) has two different active isoforms, isoform A and isoform B. Isoform A has been linked to cancerous tumor cell migration while Isoform B has not 1. In trying to understand differences in their enzymatic activity, it is important to study differences in their static and dynamic structures. In this study, molecular dynamics (MD) simulations, which show structural changes in time, were conducted over 100 nanoseconds using a program called GROMACS. This program produced data for each separate isoform that could be displayed graphically and then compared using the molecular structure viewing program, VMD. Statistical measures of structural changes in backbone (RMSD) and sidechain atoms (RMSF) were calculated through GROMACS and exported to a data visualization program. These RMSD and RMSF graphs have been the most useful in comparing the differences between isoform A and isoform B of LMW-PTP. Comparative results of the MD will be presented.

Christopher S. Oman (Md Fazal, Chemistry) A Paper Based Analytical Device to Colorimetrically Detect Malondialdehyde in Saliva

Oxidative stress is a disorder associated with a variety of pathological conditions such as Alzheimer's, Parkinson's disease, and many types of cancers. Oxidative stress is caused from the accumulation of Reactive Oxygen Species (ROS) in a biological systems. These ROS include free radicals and peroxides, which can then damage cells/organs. Malondialdehyde is a biomarker for oxidative stress. This project aims at developing a paper-based analytical device to detect malondialdehyde in saliva. The detection is based on formation of TBA-MDA adduct that absorbs at 532 nm. The method was optimized for time, temperature, relative mole ratio of reagents, order of addition and image analysis.



The newly developed portable method is simple, inexpensive and capable of detecting physiologically significant MDA concentrations.

Casey Palmer (Annette Raigoza, Chemistry) Absorption of Isothiocyanates on Gold

Abstract

Self-assembled monolayers (SAMs) have previously been used to alter the surface properties of metals. Various SAMs of alkyl isothiocyanates were created on a gold surface using several different surface functionalization techniques. Surfaces were characterized using a scanning tunneling microscope (STM) to observe differences in the surface structure compared to SAMs formed using the well-known surface of octanethiol on gold. Through co-absorption experiments, samples prepared from a solution of two molecules, octanethiol has been found to have stronger interactions with the gold surface than the isothiocyanates. Samples of isothiocyanate prepared using heat appeared to form disordered SAM's on the surface, whereas techniques without heat produced a well-ordered SAM.

Samantha L. Tinucci (Edward McIntee, Chemistry) Expression, Purification, and Analysis of the Biological Activity of Human Low Molecular Weight Protein Tyrosine Phosphatase

Protein tyrosine phosphatases (PTP) are enzymes that play a crucial role in the cell signal transduction process through dephosphorylation of phosphoproteins. This affects many cellular processes such as growth, migration, cell proliferation, gene transcription, and immune response. Low molecular weight protein tyrosine phosphatase (LMW-PTP), an 18 kDa Class II PTP, is linked to increased cell invasivity, epithelial cell migration, and tumorigenesis. The protein has two active isoforms. It has been suggested that the isoforms each have opposing roles in the formation process of tumors. Overexpression of LMW-PTPs have been found in human breast, colon, bladder, and kidney tumor samples. This suggests selective inhibition of LMW-PTP has the potential to serve as a novel therapeutic cancer treatment. Careful handling of the phosphatase protein is essential as each isoform is susceptible to oxidation, precipitation, and freeze/thaw changes in activity. Kinetic analyses of both isoforms of LMW-PTP will be discussed. These studies are a critical step in the longer-term development of differential chemical modulators of LMW-PTP that might have anti-cancer applications.

**Education**

Emma Johnson, Amy Maslowski, LaDeanna Swanson, Kelly Thoreson, Samantha Womeldorf (Catherine Bohn-Gettler, Education) I Always Entertain

## Great Hope... When Reading Chemistry? The Effect of Emotion on the Comprehension of Chemistry Texts

Reading is a common avenue for learning. Therefore, it is important to understand what influences text processing. The primary goal of this study is to understand how emotions, goals, and text difficulty individually and interactively affect comprehension. In two norming studies, emotion-inducing videos were validated, and expository chemistry texts were developed and validated to be easy versus difficult. Next, in the comprehensive study, undergraduates watched videos and rated their feelings of hope and hopelessness. Participants were instructed to read a chemistry text as though they were studying for an exam or browsing a magazine. While reading, their cognitive strategies were measured using a write-aloud task. After reading, participants answered multiple choice comprehension questions. The results provide insight into better ways of understanding how emotion affects learning.

### **Exercise Science and Sport Study**

Laura Bailly (Mary Stenson, Exercise Science and Sport Study) Effect of three different warm-up treatments on performance in a female college aged population.

**Purpose:** A proper warm-up is essential for preventing injuries and optimizing performance. Dynamic stretching (DS) and foam rolling (FR) may prepare the nervous and muscular systems for strength and power exercise better than static stretching (SS). The purpose of this study was to examine the effect of three warm-up treatments on performance.

**Methods:** Subjects were 11 recreationally active females ( $20.5 \pm .9$  yrs.;  $169.5 \pm 6.7$ cm;  $66.1 \pm 9.8$  kg). Warm-up treatments included SS, DS, and FR. Targeted muscles included calves, hamstrings, quadriceps, gluteus maximus, and iliotibial band. Each subject performed three trials in randomized order separated by at least 48 hours. After the warm up treatment, subjects completed a static balance stork test, dynamic balance star excursion balance test, vertical jump (VJ), and agility t test. Multiple trials of each test were performed and the best performances were used for analysis. Data for the dynamic balance test was normalized for leg length and compiled to form a composite score.

**Results:** Data was analyzed using a repeated measures ANOVA. There was no significant difference between treatments for static balance ( $F(2,12)=0.183$ ;  $p= 0.838$ ), or dynamic balance ( $F(2,20)= 0.882$ ;  $p= 0.430$ ), even after dynamic balance was normalized for leg length ( $F(2,20)= 0.971$ ;  $p= 0.396$ ). Significant differences occurred in VJ ( $F(2,20)=9.574$ ;  $p= 0.001$ ) between SS ( $37\pm 4$ cm) and FR ( $40\pm 4$ cm) ( $p=0.001$ ) and SS and DS ( $39\pm 5$ cm) ( $p=0.012$ ). There was no significant difference in VJ between DS and FR ( $p=0.186$ ). No significant difference occurred between treatments for agility ( $F(2,20)= 2.517$ ;

p=0.106). Conclusions: Balance was largely unaffected by the type of warm-up, but since it is mostly dependent on muscular strength, balance may respond to any warm-up. Power (VJ) was significantly higher after DS and FR than SS. Agility was not different between warm-up treatments; however, tests performed prior to the agility test may have added to the warm up.

#### Joseph L. Earney (Mary Stenson, Exercise Science and Sport Study) McPoil's Anthropometric Measurement Method is a Valid Estimate of Plantar Surface Contact Area

**Introduction:** High plantar surface contact area (PSCA), associated with pes planus, is a risk factor for development of lower extremity overuse injuries. McPoil and colleagues (2009) showed that a 6-point manual anthropometric foot measuring method could accurately quantify PSCA. The original static McPoil method was validated with dynamically obtained digital readings; with subjects in mid-gait stepping on a pressure sensor. Previous researchers have argued that dynamically obtained data is more practical, but McPoil's static method has yet to be assessed with static standing digital measurements. The intent of this study was to determine the accuracy of the McPoil's method compared to digitally obtained static PSCA values.

**Methods:** Six foot measurements were collected on both feet of 28 subjects (18F, 12M, mean age  $20.6 \pm 0.9$  yrs) using a customized Brannock device platform according to McPoil's procedure. The measurements as well as one ratio were entered into McPoil's stepwise regression analysis to calculate PSCA. McPoil PSCA values were compared to actual static values using a transducer platform (NOVEL EMED-X). A bivariate correlation was used to determine the relationship between the two tests.

**Results:** McPoil values were strongly correlated to the static digital measurements ( $r = 0.875$ ,  $p < .001$ ,  $N = 56$ ). The relationship was stronger than previous researchers found when using dynamic digital measures of PSCA ( $r = 0.77$ ,  $N = 310$ ). Significantly different scores between the two static tests confirm that the McPoil measure is an estimation tool rather than exact measure ( $t = 3.96$ ;  $p < 0.001$ ).

**Conclusion:** Using simple anthropometric foot measurements, the McPoil method was an effective estimate for PSCA using static digitally obtained values. The results of our static study support that the McPoil method can be an effective tool for clinicians without access to expensive pressure plate instrumentation to assess PSCA under walking and standing situations.

Dorealyss A. Johnson (Mary Stenson, Exercise Science and Sport Study) Title: Do Division III Ice Hockey Players Experience Coach Intended Practice Intensity?

Purpose: To examine differences between a coach's intended practice intensity, athletes' perceived rating of intensity, and athletes' physiological training load.

Methods: The session rating of perceived exertion (RPE) and training load (TL) of 11 female NCAA Division III ice hockey players were collected over 2 weeks of practices (8 sessions total). Coach rating of intended exertion (RIE) was obtained prior to each practice. RPE was collected at the cessation of each practice, and TL was collected using Polar Team2 heart rate monitors and was automatically calculated upon data import. The mathematical equation calculates workload based on duration and intensity of activity (from HR) specific to each athlete's height, weight, max HR, estimated VO<sub>2</sub>, and estimated anaerobic threshold.

Results: Results were compared using a Kruskal Wallis Test. A significant difference occurred between groups ( $H(2) = 6.679$ ,  $p = .035$ ), with mean ranks RPE = 104.43, TL = 132.62, and RIE = 122.69. Using a Mann-Whitney U test, TL and RPE ( $U = 2255.5$ ,  $p = .026$ ) and RPE and RIE ( $U = 2755.5$ ,  $p = .046$ ) were significantly different. TL and RIE were not significantly different ( $U = 2948$ ,  $p = .232$ ).

Conclusion: Athletes perceived practice to be easier than both coach intended intensity and their physiological exertion, while intended practice intensity matched how hard the athletes were working physiologically. Athletes were working exactly as intensely as their coach intended. However, they did not perceive as though they were working as hard as they were. When training load is closely matched to coach intended intensity and less than athlete perceived intensity, risk for overtraining may be mitigated.

Piper S. Murray (Mary Stenson, Exercise Science and Sport Study) The relationships between stress, aggression, and injury rate in contact sport athletes

Purpose: Participation in speed and contact sports as well as athlete stress increase risk for acute injury. The purpose of this study was to examine the relationships between stress, aggression, and rate of acute musculoskeletal injury in D3 varsity and club level athletes.

Methods: Male and female athletes competing in contact sports including basketball (male:  $n = 5$ , female:  $n = 11$ ), football (male:  $n = 51$ ), hockey (male:  $n = 7$ , female:  $n = 7$ ), lacrosse (male:  $n = 4$ , female:  $n = 7$ ).

= 10), rugby (male: n = 7, female: n = 10), soccer (male: n = 11, female: n = 16), volleyball (male: n = 2, female: n = 15), water polo (male: n = 4, female: n = 1), and wrestling (male: n = 12) were asked to complete the Perceived Stress Scale (PSS) and Buss-Perry Aggression Questionnaire (AQ12). They were also asked about their sex, sport, playing time, the number, type, and severity of any injuries sustained while participating in their specified sport over the past two years. Analysis included bivariate and partial correlations.

Results: Overall injury rate was correlated with physical aggression (PA) (R=.287, p=.000), verbal aggression (VA) (R=.233, p=.002), anger (A) (R=.186, p=.015), and total aggression (TA) (R=.200, p=.009). Stress was only correlated with injury among first-year students (R=.358, p=.027). Relationships between types of aggression and injury were particularly strong amongst rugby players (PA: R=.758, p=.000; VA: R=.618, p=.008; A: R=.593, p=.012; TA=.601, p=.011) and first-year football players (PA: R=.611, p=.005).

Conclusions: No overall relationship was found between injury and stress; however, aggression and injury are highly related in football and rugby players. These results suggest that future interventions aimed at reducing injury in football and rugby players may wish to focus on improving athletes' abilities to manage aggression.

Janae L. Myers (Mary Stenson, Exercise Science and Sport Study) Effects of a virtual training partner on cycling time trial performance in recreationally active females

Purpose: The purpose of this study was to examine the effect of a virtual training partner (ghost) on heart rate (HR), rate of perceived exertion (RPE), thoughts, watts, and time during a 4-mile cycling time trial. Methods: Recreationally active female college students (N = 11) performed two 4-mile time trials along a scenic route displayed on an Espresso Interactive Bicycle. The second trial incorporated a ghost on the route set to a pace 8.8% ( $\pm 1.5\%$ ) faster than the participant's first trial time. Subjects were told that the ghost was set to the exact pace from their first trial. HR, RPE, associative and dissociative thoughts, watts, and time were recorded every mile throughout the courses. Subjects were briefed on the differences between associative and dissociative thoughts prior to participation. Results: Cycling time was significantly faster ( $t = 3.37$ ,  $p = .007$ ) for the ghost treatment (ghost:  $976.64 \pm 102.55$ s; control:  $1029.91 \pm 117.93$ s). The interaction between treatment and mile was not significant ( $F = 1.57$ ,  $p = .218$ ). Upon further analysis, mile two (ghost:  $296.64 \pm 36.72$ s; control:  $312 \pm 30.65$ s;  $p = .022$ ) and mile three (ghost:  $238.82 \pm 28.2$ s; control:  $264.09 \pm 50.28$ s;  $p = .038$ ) were significantly faster in the ghost treatment. Dissociative

thoughts were significantly higher in mile one (ghost:  $6.73 \pm 1.62$ s; control:  $5.18 \pm 1.60$ s;  $p = .046$ ), two (ghost:  $6.09 \pm 1.51$ s; control:  $4.14 \pm 1.76$ s;  $p = .003$ ), and three (ghost:  $6.77 \pm .984$ s; control:  $5.09 \pm 1.51$ s;  $p = .004$ ) during the ghost treatment. There were no significant differences in HR, RPE, and watts between treatments. Conclusions: Using a ghost during a cycling time trial may improve time to course completion. Greater dissociative thoughts during the ghost trial suggests that attentional focus was diverted from the participants' physical discomforts to the ghost. Focus exerted to beat the ghost helped to produce an overall faster performance in the time trial.

#### Isabel E. Sim-Campos (Mary Stenson, Exercise Science and Sport Study) The Use of Yoga as a Prevention Method for ACL Injuries

**Purpose:** The purpose of this study was to examine the effect of yoga on the activation and inhibition of the quadriceps (QUAD) and hamstrings (HAM) muscles. High QUAD/HAM (Q/H) ratio may predict ACL injuries. Yoga may help prevent ACL injuries by teaching people to reduce their Q/H ratio by correctly isolating QUAD and HAM muscles. **Methods:** Thirty recreationally active individuals were placed into one of two groups. Group 1 ( $n=17$ ) participated in a 1-hour yoga class where a certified yoga instructor taught subjects to correctly isolate appropriate muscles for specific exercises. The control group ( $n=13$ ) sat passively for 1-hour. Both groups underwent EMG testing before and after their 1-hour session. Activity of the vastus lateralis (QUAD) and semitendinosus (HAM) were recorded during two isometric exercises (1 HAM and 1 QUAD exercise). EMG values were normalized to baseline and Q/H ratios for each isometric exercise were created. **Results:** A 2x2 mixed ANOVA was used to analyze group differences over time. No significant interaction between time and treatment ( $F_{1, 28}=0.087$ ;  $p=0.770$ ) and no significant main effect for time ( $F_{1, 28}=0.097$ ;  $P=0.758$ ) were observed for the Q/H ratio during the QUAD exercise. Also, no significant interaction between time and treatment ( $F_{1, 28}=0.614$ ;  $P=0.440$ ) and no significant main effect for time ( $F_{1, 28}=0.225$ ;  $P=0.618$ ) were observed for the Q/H ratio during the HAM exercise. The yoga group did not have lower Q/H ratios during either exercise after the yoga class compared to those in the control group. **Conclusion:** Yoga may not be an effective way to reduce Q/H ratio by teaching conscious isolation of the QUAD and HAM muscles. However, previous researchers have found individuals to have a lower Q/H ratio with chronic yoga practice.

#### **Experiential Learning & Community Engagement**

Victoria L. Beach (Angela Whitney, Experiential Learning & Community Engagement) Jackson Fellows: The Early Learning Center

During my time at the College of Saint Benedict, I was lucky to be a part of the Marie and Robert Jackson Fellows Program. Through this program, I spent my summer working at the Early Learning Center in Brookings, South Dakota. The Early Learning Center is a unique early childhood development center because it is connected to a retirement facility for older adults. This allowed for the children and the adults to foster relationships with one another through various intergenerational programs. Additionally, I helped to increase cultural awareness by implementing daily Spanish lessons into the lesson plans.

Diana Elhard (Angela Whitney, Experiential Learning & Community Engagement) MORE: Working with and Learning from New Americans

Over 95,000 refugees have been resettled in Minnesota since the mid-1970s. As a Jackson Fellow, I served full-time at MORE in the summer of 2015. MORE provides social services, English classes, and mental health services for New Americans, both immigrants and refugees. I served in all three program areas. Minnesota has a large network of social service agencies and community organizations working to help refugees and immigrants integrate into American and Minnesota life. While refugees and immigrants face different challenges, they also struggle with similar aspects of language and cultural immersion. The depth of care provided by organizations in Minnesota, and particularly at MORE caters to the needs and empowerment of all peoples. In light of the current rhetoric surrounding new members of the Minnesotan and American communities, organizations like these deserve greater support for the services they provide.

Theresa J. Farrell (Angela Whitney, Experiential Learning & Community Engagement) Jackson Fellows Individual Presentation

The presenter will reflect on her time as a Jackson Fellow and her experience interning at United Way of Central Minnesota as a Community Impact Intern. During her time at United Way she worked on various projects engaging with community members and connecting them with resources. She will also share her experiences working with the Jackson Fellows on a cumulative project and attending professional and leadership development workshops.

Michelle Hansmann (Angela Whitney, Experiential Learning & Community Engagement) Catholic Charities Client Advocate

This poster presentation will share my experience as a Client Advocate at Catholic Charities Dorothy Day Center in St. Paul, Minnesota. The Dorothy Day Center is a homeless shelter which provides services to connect people with medical and mental health care, hot meals, showers,

internet access, laundry, and employment counseling. The daytime resource center transitions at night into an overnight emergency shelter. I spent my time interacting with homeless clients, assisting with client check-in and intake, serving meals, restorative justice program, and housing outreach. Returning from a semester abroad in India, I found my summer experience as a Jackson Fellow meaningful in examining homelessness at the local level and learning about the complex issues that contribute to the cycle of poverty including: drug and alcohol addictions, domestic violence, and mental illness. Come to hear about my incredible experience and how I look forward to bringing the skills I learned as a Jackson Fellow into a career in public policy and social justice advocacy.

Jacqueline M. Liska (Angela Whitney, Experiential Learning & Community Engagement) Individual Jackson Fellows Presentation

Looking into my experience as a Marie and Robert Jackson Fellow at the Boys & Girls Club of Brookings, SD. I reflect on my time as an Area Director Intern in Brookings, SD as well as my participation in the leadership and professional development seminars held throughout the summer through the Fellowship.

Meg Schrafft (Angela Whitney, Experiential Learning & Community Engagement) CSB Marie and Robert Jackson Fellows Internship at Birthline, Inc.

The CSB Marie and Robert Jackson Fellows program supports 10 students each year in an internship related to civic engagement and public policy, providing financial support in addition to professional development. This presentation will focus on the presenter's experience in the 2015 cohort of the Jackson Fellows at her internship site, Birthline Inc.

Sadie Vahle (Angela Whitney, Experiential Learning & Community Engagement) Jackson Fellows Summer Internship: 360 Communities

As a Marie and Robert Jackson Fellow, I spent my summer interning at 360 Communities – a nonprofit in Dakota County. 360 Communities' mission is three-fold: they seek to prevent violence with two domestic assault shelters for women (the Lewis Houses), ensure school success by working with students in the Dakota County schools who come from families facing adverse situations, and promote self-sufficiency with five food shelves and two community resource centers. My role this past summer was the self-sufficiency intern in the Burnsville food shelf. Each day I met 21 families as they sought food support. In our meetings I assessed their financial situation and provided them with resources and



tools that would hopefully lead them towards self-sufficiency. This internship provided exposure to more of the social side of economics (my major) which has provided an entirely new dimension to my academic experience here at CSBSJU.

Bao Yang (Angela Whitney, Experiential Learning & Community Engagement)  
Jackson Fellow-Health and Wellness

This presentation will focus on a summer fellowship at a non-profit organization called Hmong American Partnership located in Saint Paul, Minnesota. The student worked in the Health and Wellness department. The two primary programs that the student worked on was the Learn and Live program which is a program that focuses on educating and providing resources for minority women to learn and get screening for breast and cervical cancer. The other program is the MNsure program which helps people find affordable medical insurance. Come to this presentation to learn more about this student's experience working with low income and refugees along with the systematic barriers in the healthcare system.

### **Hispanic Studies**

Marilyn J. Brakke (Elena Sanchez Mora, Christina Hennessy, Hispanic Studies)  
Multicultural Mathematics: The Mayan number system and its enrichment of basic arithmetic

This research paper argues that the teaching of the Mayan numerical system could improve the instruction of basic mathematics in the United States. It shows that by understanding the historical and cultural importance of numbers in ancient Mayan thought and learning the operational techniques used to compute basic arithmetic, students will see math more comprehensively. The new perspective offered by the Mayan number system and forms of basic operations provides a simpler and more concrete representation of units and new techniques for multiplication and division that eliminate memorization of tables. The incorporation of these new techniques into primary instruction would reach diverse learners, create concrete understanding and incorporate a basic understanding of the Mayan culture.

Katrina J. Christian (Christina Hennessy, Hispanic Studies) The Health Care System in Guatemala: a proposal for its improvement

My project analyzes and examines the current health care system in Guatemala by taking into account social, political, and historical contexts. Through examining failed health reforms, different countries' successes, and using the example that Paul Farmer has implemented in

Haiti, I constructed a proposal as to how the health care system could effectively begin to develop.

Anna M. Cron (Elena Sanchez Mora, Christina Hennessy, Hispanic Studies) One in the Same: The Red-Green Debate in Ecuador

Ecuador is often categorized as an underdeveloped country with a troubled political and economic history. In the past, Ecuador has failed to represent the interests of the marginalized, and massive social protests have expelled democratically elected presidents from office. Despite its challenges, it is one of the most influential Latin American countries in the indigenous movement. Currently, indigenous communities advocate for environmental policies opposing the social-democratic government's desire to extract oil from the Amazon Basin. Indigenous people believe they are one with their lands, and to destroy one is to destroy the other. My research distinguishes the differences between the "red" social-democratic Correa administration and the "green" environmentalists, primarily indigenous peoples, with a concluding argument on what stance will best benefit Ecuador in the future.

Anne E. DeSutter (Elena Sanchez Mora, Christina Hennessy, Hispanic Studies) The Globalization of Bolivian Quinoa: environmental, economic and ethical implications

In the past two decades the high global demand for quinoa has had a direct impact on Andean countries. Especially in Bolivia, a country with one of the highest indigenous populations and rates of poverty, the increased production of quinoa has sparked major social, economic, and environmental changes in the region. This paper has two main objectives. First, to look at the history and current situation of quinoa farmers in order to better understand how the increase in quinoa demand, and therefore production, has affected the environment, the economy, and communities in Bolivia. Second, to analyze the moral implications of the importation of quinoa to satisfy the demand from first-world countries, such as the United States or those in Europe.

Michael H. Kerfeld (Christina Hennessy, Hispanic Studies) Work Visas: advantages and disadvantages for Mexican immigration

I researched the economic benefit of Mexican immigration through four visas (H-1B, TN, H2A and H-2B). I looked at this form of immigration strictly from an economic standpoint. I analyzed the process of receiving each visa including its difficulties, how many visas are given each year and which are the most popular states that have them, as well as the jobs that are included for each visa. Ultimately, I used that information to show how this form of immigration positively affects our economy.

Anna E. Klonowski (Christina Hennessy, Hispanic Studies) Cultural Poverty: Combatting the Oppression of the Indigenous Population of Guatemala

This project focuses on the relationship between culture and poverty in the indigenous Maya population of Guatemala. For the impoverished indigenous person from Guatemala, poverty reflects more than a lack of money or resources; it also reveals a system of cultural poverty created through discrimination and the suppression of culture. Because of this, to combat poverty in this population, it is necessary to confront the discrimination they face. First, this project defines cultural poverty and explains how cultural discrimination relates to it and is manifested through the lack of education and political representation. Second, it presents the historical context of Guatemala that created the atmosphere for cultural poverty and examines the present realities that the indigenous population faces. The final section discusses reasonable steps for combatting cultural poverty in the indigenous Maya communities of Guatemala.

## **Mathematics**

Stephanie Anderson (Bret Benesh, Mathematics) Multiplication with Lines

Multiplication with lines is an interesting method to visualize multiplication that reduces it to simple counting.

Brandon K. Beranek (Bret Benesh, Mathematics) There is a fast and easy way to determine if a number is divisible by 3 in base ten.

To find a possible pattern of numbers that are divisible by three in the base ten unit. Any pattern will work just looking for a way to help out people who struggle with math.

Jennifer Cortez (Bret Benesh, Mathematics) Casting Out Nines

Casting out nines is a fast and easy method that can be used to ensure that math calculations are correct after solving through hand computation. This method could be used for addition, subtraction, multiplication, and division when working with integers.

Megan Dierberger (Bret Benesh, Mathematics) The Last Cookie

I will be presenting on the "The Last Cookie." This is a game where there are two teams and there are a number of cookies in the middle. Each team takes turns picking cookies. There is a certain number of cookies you can take each turn. The team that takes the last cookie loses.

I will be giving different strategies in order to win the game. I will discuss how you win if you can take 2 or 3 cookies per round, but not 1. I will also discuss how you could take 1, 2, or 4. There will be other combinations and winning strategies included.

Emily Eiss (Bret Benesh, Mathematics) Russian Peasant Multiplication

This project explains why Russian peasant multiplication gives the correct answer to a multiplication problem.

Alexandria Erickson (Bret Benesh, Mathematics) Russian Peasant Multiplication

For my Fundamentals of Mathematics course, I will be describing Russian Peasant Multiplication in a creative and interesting way while getting to the root of this algorithm and why it works.

John Fitzpatrick (Bret Benesh, Mathematics) The Last Cookie

Describe and display and challenge viewers to game of simple number removal. Players remove "cookies" in order to force their opponent to take the last cookie. Whoever takes the last cookie loses. Different sets of rules regarding how many "cookies" can be taken per turn are used to encourage different strategies to be used. The goal is to help observers learn more about the inherent patterns in numbers and encourage creativity.

Johannah Frisby (Bret Benesh, Mathematics) Russian Peasant Multiplication

I will be explaining the Russian Peasant Multiplication algorithm, and how it gives the correct answer.

Jasmin Garza (Bret Benesh, Mathematics) Russian Peasant Multiplication

A multiplication algorithm called "Russian peasant multiplication.

Megan Gemuenden (Bret Benesh, Mathematics) Casting out Nines: An Explanation of Algorithmic Arithmetic

This project features the "Casting Out Nines" method which aids an individual in their determination of whether or not they did their arithmetic correctly. Not only does this project explain how to use the algorithm correctly, but also answers the question of "why does it work?"

Sarah L. Griffin (Bret Benesh, Mathematics) The Last Cookie

The Last Cookie is a game we discussed in our class. It involves two people with a set amount of "cookies" or other small objects. (We usually use pennies in our class.) Each person takes one or two objects per round and the object of the game is to make the other person take the last object. Our professor challenged us to find multiple ways to guarantee a win in the game, using different techniques and strategies.

Kelly M. Headington (Bret Benesh, Mathematics) Trachtenberg System for 11's and 12's

I will explain how to multiply integers by 11 and 12 using the Trachtenberg System algorithms and show why these algorithms give the correct answer to the multiplication problem.

Katherine Hird (Bret Benesh, Mathematics) The Trachtenberg System

This project aims to analyze the Trachtenberg System of Mathematics regarding multiplication. Through visual and written explanation, it will become evident that this method of multiplication is efficient and accurate.

Eliana E. Jacobson (Bret Benesh, Mathematics) Division by 3? Easy!

It is known that there is a fast and easy way to determine if a number is divisible by 3 in base ten. I will be explaining why this algorithm works.

Stephanie M. Jester (Bret Benesh, Mathematics) Last Cookie Extensions and Patterns

My project is about the Last Cookie game that we learned about in my math class. In this game, the goal is to make your opponent take the last cookie. In my project, I will show and discuss how to play the game and any new patterns that I found when using numbers outside of the numbers we used in my class. I am going to use different numbers and look for patterns to win Last Cookie using these different numbers and discuss these patterns that should help you win last cookie.

Lauren Koller (Bret Benesh, Mathematics) Proof of the Divisibility by Three Rule

There is a fast and easy way to determine if a number is divisible by 3 in base ten. The explanation of why this rule works will be demonstrated in the presentation.

Megan L. Laraway (Bret Benesh, Mathematics) Russian Peasant Multiplication

I am doing my project on Russian Peasant Multiplication. I am going to talk about what Russian Peasant Multiplication is and how it works. I will also be testing to see if there is ever a situation where it does not work.

Sydney Lura (Bret Benesh, Mathematics) Russian Peasant Division: Why it Works

I will be showing and explaining why the Russian Peasant Division Algorithm gives you the correct answer. I will show how this algorithm works, but will be focusing on showing how this gives you the right answer in multiple problems.

Matty M. McGarvey (Bret Benesh, Mathematics) Russian

Russian peasant division is a unique approach to how we normally solve division problems. For this project, I will be explaining how to do this algorithm, but more specifically why this algorithm gives you the correct answer when solving division problems.

Alexandria Nelson (Bret Benesh, Mathematics) Explaining the Casting Out Nines Algorithm

Explaining the Casting Out Nines Algorithm

Erin O'Brien (Bret Benesh, Mathematics) Math 121- Trachtenberg System

I'm explaining why one of the algorithm in the system is guaranteed to work.

Claire O'Konek (Bret Benesh, Mathematics) Casting Out Nines

This method determines whether an arithmetic question or algorithm is done correctly. The Casting Out Nines process provides an explanation of why and how an algorithm works the way it does.

Karissa Pazen (Bret Benesh, Mathematics) Peasant Multiplication

I will be presenting on the mathematical topic of Peasant Multiplication. The presentation will include information about what it is, how it works, and where the algorithm came from.

Kennedy Peitz (Bret Benesh, Mathematics) Math 121 Project

I will be researching quick and correct ways to determine if a number is divisible by 3.

Mikayla L. Pellegrine (Bret Benesh, Mathematics) Last Cookie

Last Cookie is a strategical game where you have nine cookies. You and a friend take turns either taking two cookies or one. The objective of the game is to make sure that you do not end up with the last cookie. For my project I will be going more in depth to find different strategical ways to win this game. These different ways may consist of changing the number of cookies there are to begin with or changing the amount of cookies each player can take each time.

Cathleen D. Renckens (Bret Benesh, Mathematics) Divisible by 3?

"Divisible by 3?" draws attention to the rule we all learned as kids about how to tell if a number is divisible by three or not. While people may know the simple rule, do they know the complicated reasoning behind the rule? This project explains the background logic behind the rule to uncover why it works.

Alexandra Schiffler (Bret Benesh, Mathematics) Terminating Decimals

My project will be discussing how to know when a fraction will be a terminating or non-terminating decimal. I will discuss how to solve this in our number system, and I will also explain how to solve it in Martian. Our number system is set up in a base ten system and in Martian we will be looking at it in a base six system. My project will explain how to determine whether or not a fraction in Martian will terminate or not.

Rachel Sharp (Bret Benesh, Mathematics) The Trachtenberg System--  
Multiplying by 12

Jakow Trachtenberg developed ways in which to increase the speed of mental math in World War II while he was imprisoned in Nazi camps. I will explain how to multiply by twelves, why it is guaranteed to give the correct answer, and how it is faster to do this algorithm than the standard multiplication rules taught to students.

Ya Thao (Bret Benesh, Mathematics) Last Cookies Game

The project that I will be presenting on Scholarship and Creativity Day will be the Last Cookie Game. Here is how the game works, the person who takes the last cookie loses. Let's say you have 10 cookies and you are sharing it with your best friend. The rules is you can either take 1 or 2 cookie(s) per round. I was able to find that in order to win, or not take the last cookie will be to go second and do the opposite; if your best friend takes 1 cookie then you should take 2 cookies, but if your best

friend take 2 cookies then you take one cookie. The equation is  $3n+1$ . The question throughout my project will be, what is that you could remove either 2 or 3 cookies per round, but not 1? What if you could do 1, 2, or 4? What about other combinations?

Jamie Weekley (Bret Benesh, Mathematics) Nines Compliment Rule

What is the Nines Compliment Rule, how does it work and why does it work?

Angela B. Yamoah (Bret Benesh, Mathematics) How to Prove the divisibility rule for 3

There is a fast and easy way to determine if a number is divisible by 3 in base ten. This is an explanation of why this method works.

## **Music**

Allysa L. Larson (Susan Cogdill, Music) Hearing Loss in Musicians

The purpose of this presentation was to explore the research that has been done on hearing loss in instrumental music teachers. Musicians may be at a higher risk for hearing loss than other professions. Music teachers are exposed to excessive sounds such as instruments, metronomes and recordings above the damaging level, 85 dB, for periods of time, which often are longer than the suggested amount to avoid hearing loss. Many instrumental ensemble classrooms are also smaller than the recommended space to let the sound disperse. In order to maintain good hearing for one's musical career, music teachers may need to take precautions. Researchers encourage musicians to wear attenuated earplugs, avoid being directly next to the source of sound, and to take breaks within practice sessions.

## **Nutrition**

Jenna C. Bautch (Jayne Byrne, Nutrition) Can Your Exercise Habits Affect Your Blood Lipids and Resting Blood Pressure Values?

WHAT IS THE CORRELATION BETWEEN COLLEGE STUDENTS' HABITUAL EXERCISE PATTERNS, FASTED LIPID PROFILE AND RESTING BLOOD PRESSURE MEASUREMENTS? Bautch, J.C. and Byrne, J. MS, RDN, LD, College of St. Benedict, St. Joseph, MN

The American College of Sports Medicine (ACSM) recommends college students participate in aerobic and anaerobic exercise to improve their fasting blood lipids and resting blood pressure measurements.

Purpose: To examine how college students' exercise habits impact their fasting blood lipids and resting blood pressure measurements.



Methods: Institutional Review Board approval was obtained and informed consent was signed before research was conducted. One hundred and thirty-eight students from a private college were asked to complete an exercise questionnaire regarding the average frequency and duration of aerobic and anaerobic exercise performed over a one-week span. Students' fasting HDLs, LDLs, TGs and resting blood pressure values were matched to completed exercise questionnaires. Data was analyzed using SPSS to determine correlations between exercise habits and blood lipids or blood pressure measurements and to establish if there were differences between sexes for lipids and blood pressure measurements. Results: The amount of physical exercise was not correlated to fasting blood lipids or blood pressure measurements. Seventy-one percent of students meet the ACSM exercise recommendations for 30 minutes of moderate-intense physical activity 5 days/week. Average fasting HDLs ( $55 \pm 14$  mg/dL), LDLs ( $81 \pm 25$  mg/dL), TGs ( $95 \pm 48$  mg/dL), and resting blood pressure (107/70 mmHG) measurements were in normal ranges set by the Center for Disease Control (CDC). Twenty-five percent of students are above the CDC recommendation for TGs, 5% over LDLs, and 30% are under for HDL measurements. Males had significantly lower HDLs ( $\sim 47 \pm 12$  mg/dL) compared to women ( $\sim 58 \pm 14$ ) ( $p=0.01$ ). Males had significantly higher resting diastolic blood pressure readings ( $\sim 71$  mmHG) compared to women ( $\sim 69$  mmHg) ( $p=0.01$ ). Conclusion: College students' from the study were fairly active which may have led to the lack of correlation between physical activity and blood lipids. However, 29% of the students do not meet the ACSM recommendation for days/week. Exercise may not significantly affect blood lipids or blood pressure when blood lipids or blood pressure measurements are within normal limits. While 29% of students do not meet the ACSM recommendations, 15% of those students also do not meet the CDC recommendations and would benefit from lipid management education.

Mary Cherne (Alexa Evenson, Nutrition) What is the relationship between CVD risk factors and dietary calcium intake in a college-age population?

Risk factors for cardiovascular disease (CVD) including dyslipidemia and hypertension can develop in adolescence and increase risk of CVD in adulthood. Improved blood pressure and lipid profiles are associated with higher dietary calcium intake in older adults, but limited data exists in young adults. Purpose: Determine the relationship between dietary calcium intake and CVD risk factors in a college-age population. Methods: IRB approval was obtained. Fasting blood samples were collected from 149 college students ages 18-24. Serum total cholesterol (TC), LDL, HDL, and triacylglycerol (TG) concentrations were measured using a LDX Cholestech machine, blood glucose using a Precision Xtra glucometer, and blood pressure (systolic [SBP] and

diastolic [DBP]) using an Omron automated sphygmomanometer. Dietary calcium intake was assessed using the Brief Calcium Assessment Tool (BCAT) (1). Correlation between CVD risk factors and dietary calcium was determined. Unpaired t-tests determined differences between sexes. Results: Average daily dietary calcium intake was 804 mg (RDA for 18 year olds: 1300mg, 19-50 year olds: 1000mg). Mean calcium intake was 186 mg lower in females than males ( $p=0.001$ ). Acceptable TC, LDL, and TG concentrations occurred in 85%, 92%, and 75% of total participants respectively based on guidelines for 20-24 year olds (2). HDL concentrations were normal 75% of participants and SBP and DBP were normal in 84% and 87% of subjects, respectively. Mean HDL was lower in males than in females ( $p=0.001$ ). Mean SBP was higher in males than females ( $p=0.000$ ). TGs were positively correlated with dietary calcium intake ( $r=0.221$ ,  $p=0.010$ ). Conclusions: Average dietary calcium intake in college students is below recommendations and over half (56%) consumed less than 1000mg and 29% consumed less than 400mg. The majority of participants fell within normal ranges for lab values. Education about meeting dietary calcium recommendations may be warranted in a college-age population. The positive correlation between dietary calcium and TGs was unexpected and may be attributed to the calcium sources and the relatively small sample size.

1. Yang, Y.J., Martin, B.R., Boushey, C.J. (2010). Development and Evaluation of a Brief Calcium Assessment Tool for Adolescents. *Journal of the American Dietetic Association*, 110(1), 111-115. Doi: 10.1016/j.jada.2009.10.009.

2. Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents. (2011). Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents: Summary Report. *Pediatrics*, 128(5), S213-S256. Doi: 10.1542/peds.2009-2107c.

Laura J. Comee (Amy Olson, Nutrition) Hydration status, habits, and knowledge of collegiate cross country runners

Dehydration exceeding 2% loss of body mass can cause decreased cognitive and physical performance in endurance athletes.<sup>1</sup> While many runners carry water bottles with them, most do not know their sweat rate or fluid recommendations, increasing the risk for heat-related illnesses such as heat stroke.<sup>2</sup> Purpose: To assess hydration status, habits, and knowledge of collegiate cross country runners. Methods: Institutional Review Board approval was obtained and subjects completed informed consents. Thirty-three female and twenty-five male Division III collegiate runners participated in the study. Hydration status was assessed measuring the specific gravity of three urine samples one each before a race, recovery run, and workout run. Participants completed questionnaires regarding hydration knowledge and habits. Sweat rates

were calculated for each runner to estimate fluid losses. Water bottles were swabbed with a 3M quick swab around the lid and areas that touch the mouth and cultured using 3M aerobic petrifilms to assess cleanliness. ANOVA and T-tests were used for statistical analysis using SPSS. Results: There were no significant differences in the average urine specific gravity, however there was a bi-modal distribution and 50% of runners began the race dehydrated compared to 32.8% before the workout and 36.2% before the recovery run. Fluid consumption was significantly lower before the race compared to the other types of runs (Race:  $443.4 \pm 375\text{mL}$ , Workout:  $1206.3 \pm 552.6\text{mL}$ , Recovery:  $1287 \pm 792\text{mL}$ ;  $p=0.002$ ). Fluid consumption was similar between males and females before the workout and recovery run (Workout: males  $1153.8 \pm 459\text{mL}$ , females:  $1235.4 \pm 600.9\text{mL}$ ,  $p=0.578$ ; Recovery: males  $1240.5 \pm 664.8\text{mL}$ , females:  $1209.6 \pm 663.9\text{mL}$ ,  $p=0.499$ ). However, males did consume more fluid before the race (Males:  $661.68 \pm 471.6\text{mL}$ , Females:  $324.6 \pm 244.8\text{mL}$ ;  $p=0.09$ ) Sweat rates were higher in males (Males:  $1377.6 \pm 335.1\text{mL/hr}$ , Females:  $1128.6 \pm 320.7\text{mL/h}$ ;  $p=0.005$ ) and males ran more miles per week (males:  $65.77 \pm 12.6$ , females:  $47.64 \pm 10.17$ ;  $p=.000$ ). The average knowledge score was 58% for males and 61% for females. The majority (64.9%) of water bottles cultured had bacteria too numerous to count. Conclusions: 21% of all participants (8 males, 4 females) were severely dehydrated prior to competition. Sweat rates (mL/hr) of males were 18% higher, and males ran on average 18 more miles per week, yet consumed approximately the same amount of fluid as females before the recovery and workout runs. Males consumed more fluid before the race, but 57% of males were dehydrated compared to 45% of females. Water bottle cleanliness should be addressed by runners. Total aerobic plate count only assesses the amount of bacteria and future research is needed to determine whether the bacteria is pathogenic.

1. Thomas, D.T., Erdman, K.A., & Burke, L.M. (2016). Position of the Academy of Nutrition and Dietetics, Dietitians of Canada, and the American College of Sports Medicine: Nutrition and Athletic Performance. *Journal of the Academy of Nutrition and Dietetics*, 116(3), 501-28. doi: 10.1016/j.jand.2015.12.006.
2. Brown, S., Chiampas, G, Jaworski, C., & Passe, D. (2011). Lack of awareness of fluid needs among participants at a Midwest marathon. *Sports Health*, 3(5), 451-4.

Jackie R. Kemnic (Amy Olson, Nutrition) THE PREVALENCE OF THE “FRESHMAN 15” IN FIRST YEAR MALE AND FEMALE STUDENTS

The “freshman 15” refers to the 15 lbs a student gains during the first year of college. While little, if any evidence supports 15 lbs, two-thirds of first year students gain weight to some degree. Purpose: To determine

whether weight gain occurs, whether there are differences by gender, and to identify the factors that may contribute to weight gain during the first semester of college. Methods: Institutional Review Board approval and informed consent forms were received prior to beginning research. Students had to be 18 or 19 years of age and in the first year at a university; transfer students were not eligible. In this prospective study, baseline measurements of 43 male and 27 female first year students were conducted in September and October. Follow-up measurements for the continuing 10 male and 10 female participants were taken at the beginning of January. Participants took a survey addressing perceptions of the “freshman 15,” anthropometric and body composition measurements were assessed using the QuadScan 4000, physical activity using the Paffenbarger Physical Activity Questionnaire, and diet using the Automated, Self-Administered 24-hour dietary recall. Repeated measures analysis of variance (ANOVA) was used to determine changes in anthropometric and body composition measurements, and patterns of physical activity. A p value of < 0.05 was considered statistically significant. Results: Sixty-five percent of participants (6 females, 7 males) gained weight after one semester of college regardless of intent for weight change. Weight gain was non-significant for males (T1: 173.6 ± 30.9 lbs, T2: 175.2 ± 33.5 lbs) and females (T1: 133.8 ± 16.8 lbs, T2: 134.8 ± 17.3 lbs). The percentage of overweight BMIs decreased from 42% to 40% in females and increased from 41% to 50% in males. Non-significant gains for males and females in percent body fat (male 1.86%, females 2.03%), height (males T1: 70.3 ± 2.9 in, T2: 70.4 ± 3.1 in, females T1: 63.9 ± 1.7 in T2: 64.1 ± 1.6 in, percent lean muscle mass (males T1: 90.1 ± 5.1%, T2: 88.7 ± 5.3%, females T1: 77.5 ± 5.6%, T2: 75.8 ± 5.2%), and waist circumference (males T1: 32.3 ± 2.7 in, T2: 32.2 ± 2.7 in, females T1: 28.6 ± 2.5 in, T2: 28.4 ± 2.2 in). Hip circumference for males significantly increased (T1: 37.7 ± 4.1 in, T2: 40.2 ± 3.5 in) (p=.001). Physical activity did not significantly change and dietary intake could not be assessed due to incompleteness of the ASA-24. Conclusion: The majority of males (70%) and females (60%) did gain weight but only 1 pound on average, not 15. Lean body mass, fat mass, waist circumference, and height did not significantly increase for males and females. Only one female classified as overweight for percent body fat (31.6%) and BMI (25), but end measurements did not vary from initial measurements. Although overweight BMIs increased for males, body fat percentages remained normal and percent muscle mass increased for 20% of participants. Average body fat percentages for males (11.3%) and females (25.5%) remained within normal ranges.

Alyson K. Pulvermacher (Alexa Evenson, Nutrition) Acceptability of Different Squash Variety Lasagna Recipes to Increase Red-Orange Vegetable Consumption

Children and adolescents struggle to meet dietary guidelines for fruit and vegetable intakes. School nutrition requirements for red-orange vegetables are higher compared to other varieties of vegetables. The objective of this study was to determine if three different squash varieties were acceptable for use in school nutrition recipes.

A lasagna recipe was selected and adapted to create different versions with squash varieties (buttercup, butternut, and acorn). Computrition Hospitality Suite Version 18.7 was used to analyze the nutritional profile of the recipes. Sensory analysis assessed liking of overall taste, squash flavor, lasagna flavor, appearance, and texture using a 7-point hedonic scale (7=like extremely, 1=dislike extremely). Sensory panels were conducted in duplicate (n=66; mean age=18.89). Anova was used to determine differences among lasagna recipes. Significance was set at  $p < 0.05$ . All three lasagna recipes provided approximately 0.76 cups of red-orange vegetables, 280 calories, 11.5 g fat, and 245 mg sodium for a one cup serving. There were no significant differences in liking of overall taste, squash flavor, lasagna flavor, appearance, or texture among the three lasagna recipes ( $p > 0.05$ ). Average overall liking scores ranged from 4.64-5.00.

The recipes developed for this study could be implemented into school food service to increase red-orange vegetable consumption in adolescents as they were generally liked. Buttercup, butternut, or acorn squash could potentially be used in additional recipes to help increase red-orange vegetable intake. Future research could determine acceptability of different red-orange vegetable recipes in younger age groups.

Zach Shivers, Preston Joffer (Bernadette Elhard, Nutrition) Improving Public Health Outcomes Through Recipe Modification

Zach Shivers, Preston Joffer, (Bernadette Elhard), Department of Nutrition, College of Saint Benedict and Saint John's University

The American population is struggling to meet the new 2015 Dietary Guidelines in several aspects of their diets. Two main categories of challenge for individual's diets are sodium and saturated fat consumption, which are correlated with hypertension, chronic heart disease, and obesity. High or excessive consumption of these nutrients can lead to a variety of chronic conditions and diseases prevalent in today's society. Cultural food ways can contribute to these nutritional challenges. In this research, we dealt with German Midwestern cultural and traditional dishes that were high in these nutrients. Current Stearns County health assessment data shows that nearly 60% of the local population is overweight or obese; chronic heart disease is the second leading cause of death in Minnesota. It can be difficult to adhere to these

Dietary Guidelines due to the flavor and taste that sodium and saturated fat incorporate into many recipes. Our research specifically focused on modifying these recipes to fit recommended consumption levels for saturated fat and sodium. Numerous negative health outcomes have been observed in the American population from consuming foods containing very high levels of sodium and saturated fat. Hodge (2016) and Hammad (2015) research provides evidence that the selected recipes include excessive amounts of certain ingredients that can lead to adverse health effects and other health consequences. Before and after making recipe changes we utilized CompuTrition's software, Hospitality Suite v.18, to analyze the nutrient composition. Food for Fifty recipe standardization methodology was followed. By only slightly changing these traditional dishes and ingredients, with minimal taste alterations, we improved the overall nutritional quality of said dishes as well as the potential health outcomes associated with their consumption. Altered recipes had a nearly 60% decrease of sodium and a 25% decrease in overall fat content while maintaining the original flavor profile of the food. Recipe changes also resulted in improved taste sensory evaluations. This research created healthier recipes through the use of the 2015 Dietary Guidelines and Food For Fifty by performing recipe testing, standardization, and multiple alterations. The current nutrition evidence-base supports decreasing saturated fat and sodium consumption and these recommendations are beneficial as they decrease negative health outcomes and promote the overall health of the American public.

Jake I. Wagner (Emily Heying, Nutrition) What is the evidence that xylitol chewing gum decreases cariogenic bacteria population in college-aged students?

Dental caries represent the most widespread disease in humans with 91% of United States' adults aged 20-64 experiencing at least one cavity in a permanent tooth (CDC). Xylitol, a five-carbon sugar polyol, is an FDA approved sweetener used as a sugar substitute in chewing gum. Xylitol inhibits *S. mutans* growth and decreases adhesion of plaque to teeth when chewed in gum. Purpose. To determine if xylitol chewing gum decreases cariogenic bacteria in college-aged students. The importance of this work is to investigate the potential of xylitol chewing gum as a preventative measure against caries. Methods. Institutional Review Board Approval was received for this cross-sectional research study. Education majors aged 18-22 years old (N=30) were recruited and completed informed consents. An adaption of The World Health Organization: Oral Health Questionnaire for Adults survey was completed to assess oral health practices of subjects. Participants were randomly assigned to the xylitol, sorbitol, or control group with ten subjects in each group. The CariScreen Caries Susceptibility Meter was used to determine cariogenic bacteria population via ATP bioluminescence. Light intensity revealed through ATP bioluminescence

is equivalent to ATP concentration and reflective of cariogenic bacteria concentration within the mouth. Baseline ATP concentration were measured with the CariScreen Caries Susceptibility Meter. Students chewed gum for twenty minutes for ten days excluding one weekend. ATP measurements were collected following twenty minutes of chewing gum on day ten. A paired t-test was used to compare changes within treatment groups. The SAS system was utilized to run an ANOVA to test for significant differences between treatment groups. Results. The ATP concentration, reflective of cariogenic bacteria concentration, trended toward significance as there was a 30% decrease in the xylitol gum group, with a  $2436 \pm 2638$  (mean + SD) concentration at baseline and  $1697 \pm 1963$  bacterial count after ten days ( $p=0.094$ ). There was no significant change in ATP concentration in the sorbitol chewing gum group (baseline =  $1557 \pm 1845$ , ten day =  $1244 \pm 1673$ ) ( $p=0.69$ ). There was also no significant change in ATP concentration in the control group (baseline =  $1516 \pm 1689$ , ten day =  $1960 \pm 1995$ ) ( $p=0.29$ ). A score under 1500 indicates a healthy mouth while a score higher than 1500 signifies heightened risk of caries development.

Conclusions. Individuals in the xylitol group experienced greater attenuation of possible cariogenic bacteria after 10 days of treatment than those in the sorbitol or control group. While only the sorbitol group had an ATP concentration of below 1500 after treatment, the decrease in ATP concentration post treatment in the xylitol group was near the 1500 benchmark. Chewing gum with sugar substitutes like xylitol or sorbitol could provide the potential to decrease cariogenic bacteria population.

#### Charles Wenner (Emily Heying, Nutrition) EFFECTS OF SPORTS DRINK CONSUMPTION ON SALIVARY PH DURING EXERCISE

Individuals who regularly exercise appear to be at higher risk for developing dental caries and erosion (1). Many believe the low pH of sports drinks (typically between 3 and 4) causes saliva pH decrease below 5.5, which results in dental erosion. However, beverage consumption during exercise can maintain hydration status and salivary flow rate which can help protect teeth. Purpose: To observe the effects of water and sports drink consumption on salivary pH during exercise in college-aged students. Methods: Approval was obtained by the Institutional Review Board, and all participants signed an informed consent form prior to testing. Results were analyzed using SPSS. Ten healthy, recreationally active college students participated in three 30 minute exercise sessions on separate days. Specific gravity was measured before each exercise session using a refractometer to ensure participants were adequately hydrated. Exercise sessions consisted of cycling on an ergometer at 70%-85% of the participant's maximal heart rate. Participants were randomly assigned to one of three treatments (no beverage, water, or Gatorade) and consumed 80 mL of their designated

drink every 10 minutes during the continuous exercise session. Beverage consumption occurred after 5, 15, and 25 minutes, and saliva pH was tested occurred after 0, 10, 20, 30 minutes, and 10 minutes post-exercise using Hydrion™ Urine and Saliva pH paper. Results: Saliva pH increased by 0.165 with no beverage consumption, decreased by 0.08 with the water treatment, and decreased by 0.26 with the Gatorade treatment. None of the treatment groups were significantly different after the 30 minute exercise session (two-way ANOVA,  $p=0.057$ ). However, initial pH values were different from each other among the three treatments, so saliva pH was standardized by converting pH to change scores. The change score of Gatorade was significantly different from the control at the end of the exercise session (post-hoc LSD,  $p=0.018$ ). Conclusions: Saliva pH never dropped below the critical value of 5.5, indicating a minimal risk for erosion. Sports drinks can help maintain adequate hydration status, which can increase saliva output and oral buffering capacity, perhaps minimizing saliva pH change. Exercise or hydration status may change the composition of saliva, and method of saliva collection may yield different results.

#### Resources

1. Mulic, A., Tveit, A. B., Songe, D., Sivertsen, H., & Skaare, A. B. (2012). Dental erosive wear and salivary flow rate in physically active young adults. *BioMed Central Oral Health*, 12(8), 1-8. doi:10.1186/1472-6831-12-8.

#### Bao Yang (Emily Heying, Nutrition) THE CORRELATION BETWEEN TECHNOLOGY USAGE, HEALTH BEHAVIORS, AND ACADEMIC PERFORMANCE

Technology can make life more convenient but can also lead to unhealthy behaviors. College students are major consumers of technology and excessive technology usage may be associated with more sedentary behaviors and poorer dietary choices. Purpose: To examine the correlations between technology usage, with diet, sleep, physical activity and academic performance in college students. Methods: The Institutional Review Board approved this research and 297 college students completed a survey that asked about their technology usage, diet, sleep, physical activity, body mass index (BMI), and grade point average (GPA). The majority of the participants were female (78%,  $N=231$ ) and evenly distributed among years in college. The survey was sent via email and the first page of the survey consisted of the informed consent, consent was implied when the participant continued with the survey. Correlations between technology usage and health behaviors were determined with SPSS. Results: Out of the devices, TV, desktop computer, laptop, mobile phone, iPod, tablet, and mp3 player, the most used devices were mobile phone and computer. Computers and internet



usage averaged nine hours a day. BMI (mean= 24.1, range 12.9, 40.1) was positively correlated with technology usage, in particular T.V. (p value =0.002), computer (p value =0.035), and internet (p value=0.034). GPA (mean=3.4, range 2.0, 4.0) negatively correlated with the technology usage, in particular mobile phone (p value=0.001), T.V (p value=0.001), internet (p value=0.001) and social media (p value=0.001). The use of technology was associated with consuming less than the recommended number of servings from dairy, fruits, vegetables and grains but positively correlated with sweeten beverages (p value=0.001). Conclusion: College students should be cautious of the number of hours spent using technology because technology usage appears to come with a price, not improved academic performance but poorer grades, higher body weights, and less nutritious diets. College students need to be aware that technology can adversely influence their health and academic performance.

### **Theater**

Sarah M. Catcher, Sarah L. Griffin, Gladys K. Gutierrez-Anaya, Elizabeth A. Larson, Caitlin R. Miller, Dana M. Svensson, Caleb A. Thiels, Katherine L. Wallerich, Paige A. Wigstrom (Amelia Cheever, Theater) Costume Designs for Arms and the Man, Mother Nature and Tennessee William's One Act Plays

The Costume Design I Class has been working on several designs over the semester. Students from the class will highlight their favorite designs which may include their interpretation of Mother Nature, a traditional Commedia dell'arte character and their modern interpretation of the same character, designs for George Bernard Shaw's Arms and the Man set in 1885/1886 and a variety of One Act Plays by Tennessee Williams written between 1936 and 1954. Each design will feature their visual inspirations, historical and abstract research, rough sketches and final color renderings.

*Pellegrene Auditorium Auditorium, SJU*

### **Art**

Art Department (Simon-Hoa Phan, Art) CSB/SJU Student Film Festival

The jury-selected student films will be presented to the public together with conversations with the filmmakers and award ceremony celebrating the best in narrative, documentary, animation, and experimental films. Reception follows after screenings.

Thursday, April 21 at 7:30 p.m. in the Pellegrine Auditorium.  
Free and open to the public.

*Peter Engel Science Center 212, SJU*

**MapCores**

Kaitlin DuPaul, Alison O'brien, Cassandra Roline (Sarah Yost, MapCores) Solar Panel Efficiency

Investigate the theoretical return on a solar farm on campus based on (1) general information about solar panels, the local climate, etc and partly (2) by calculating seasonal/average insolation for this latitude. Then summarize the average production values and weigh against the cost.

*Simons Hall G10, SJU*

**Political Science**

Jake Collins, Diana Elhard (Gaynor Haeg, Political Science) The Good, The Bad & The Ugly: Political Science Honors Thesis Student Reflections 2016

Jake & Diana will discuss the POLS honors thesis process - what went well, what didn't go so well, what their recommendations are for students thinking of doing an honors thesis in the coming years. Cookies too!

## Fine Arts Presentations:

### Art

#### Schedule

*2:00 - 2:30 PM*  
*BAC C100*

Christine B. Wilda (Carol Brash, Art) Water Seen  
Through an Artistic Lens

#### Abstracts

**Wilda:** This research project has primarily involved seeking out various ways that water is used in artistic formats and constantly coming to new conclusions on the position, role, and power level of water in large-scale nature all the way down to my own reflections on water color painting. Historical fountains that capture emotion through water, giant glacier's path's that cause the earth to be at their mercy, and handmade paper making are a few of the topics that explore the uses of water in art and the overarching theme and argument that water controls what it encounters. Although there are some topics where water appears to be the material that is manipulated, water is in fact the controller and animator whenever it is used in a primary, direct context. Only when an artist is one or more steps removed from the actual material of water can it supposedly seem to be manipulated. The importances of this topic are in understanding the emotional capabilities that water can create on its own (and with the intervention of artists), in appreciating the limitless, graceful and strong qualities it possesses, and mainly, in discovering the amazing depths and beauties of this mysterious substance called water. This research project began when I noticed a small droplet of water hanging off of a pine needle on an evergreen tree. I could see the image through the droplet was upside down, and I realized just how much I don't know about water, a material that I already enjoyed very much. This project was meant to help me learn and realize what water is by using art, and I am finding it to be one of the most impactful substances I've ever encountered.

### Theater

#### Schedule

*3:25 - 3:45 PM*  
*BAC Colman*  
*Theater*

Sarah M. Catcher (Kaarin Johnston, Theater) Life After  
London

*3:50 - 4:10 PM*  
*BAC Colmman*  
*Black Box*

Emily Schoenbeck (Kaarin Johnston, Theater) The  
Road to Cheboksary

## **Abstracts**

**Catcher:** After a semester abroad in London, England I reflect on my experiences. I will discuss my academic, professional, and personal gains. I will provide examples of how I believe an international experience, such as Study Abroad, has impacted my liberal arts education, studies as a Theater major/Psychology minor, and my future.

**Schoenbeck:** A presentation on the year long process of writing the play, The Women of Cheboksary. Expect Russian fairytales, strong female characters, and a few puns.

## Humanities Presentations:

### Gender & Women's Studies

#### Schedule

*2:00 - 3:00 PM*

*CLEML A129*

Briana G. Soto, Chaltu H. Doto, Mary N. Dak, Ellesse S. McCartney, Magnolia J. Ditzler, Alyssa C. Timmerman, Jacob M. Dockendorf, Todd W. Kollodge, Benjamin J. Turnham, Padra M. Xiong, Hli Vang, Sarah N. Spear, Lisa M. Wettstein (Madhuchhanda Mitra, Gender & Women's Studies) Gender Justice: Why Should You Care?

*3:00 - 4:00 PM*

*CLEML A129*

Alyssa Timmerman (Shane Miller, Gender & Women's Studies) The Representation of Sexual Assault Victims on Law & Order: Special Victims Unit

#### Abstracts

**Soto, Doto, Dak, McCartney, Ditzler, Timmerman, Dockendorf, Kollodge, Turnham, Xiong, Vang, Spear, Wettstein:** The students of GEDN 381 class will present six Public Service Announcements addressing various forms of gender injustice that happen all around us but which remain largely invisible. The public presentation of these student-created PSAs aim to create awareness of the "hidden cost" of gender injustice that affects all of us.

**Timmerman:** I have researched the ways in which both male and female sexual assault victims are represented on the television show Law & Order: Special Victims Unit.

## Theology

#### Schedule

*1:00 - 1:30 PM*

*BAC A104*

Luke Wittman (Kari-Shane Zimmerman, Theology) From Gaudium et Spes to Evangelii Gaudium: Called to be Church

*1:30 - 2:00 PM*

*BAC A104*

Molly M. Minnerath (Kari-Shane Zimmerman, Theology) Justice Infused Solidarity: A Look at Living

Justly from the Standpoint of U.S., White,  
Economically Privileged Catholics

*2:00 - 2:30 PM*  
*BAC A104*

Michael Greenstein (Kari-Shane Zimmerman,  
Theology) The Evolution Of The U.S. Catholic  
Hospital: From Sisters In Habits To Men In Suits

*2:30 - 3:00 PM*  
*BAC A104*

Marcus W. Vievering (Kari-Shane Zimmerman,  
Theology) Developing the Common Good through  
Transformative Family Practices

*3:00 - 3:30 PM*  
*BAC A104*

Kathryn A. Cleary (Kari-Shane Zimmerman, Theology)  
Liberation for Survivors:  
A New Christian Understanding of Suffering and  
Forgiveness

*3:30 - 4:00 PM*  
*BAC A104*

Anna Klonowski (Kari-Shane Zimmerman, Theology)  
Toward Greater Awareness and Reception of the  
Stranger in our Midst: A Theological Examination of  
US Latin American Immigration

*4:00 - 4:30 PM*  
*BAC A104*

Melissa J. Torgerson (Kari-Shane Zimmerman,  
Theology) God For Us: Examining Divine Impassibility

*4:30 - 5:00 PM*  
*BAC A104*

Patrick Martin (Kari-Shane Zimmerman, Theology) A  
Theological Position on Climate Refugees

## **Abstracts**

**Wittman:** This paper will be analyzing two important church documents in order to better understand the Catholic Church. To do this, I will give an analysis of Vatican II's *Gaudium et Spes* and Pope Francis' encyclical *Evangelii Gaudium*. This will provide insight into what ways the Church has evolved in her understanding of what it means to be Church. It also will help illuminate ways in which the Church has remained constant over the span of about fifty years. In completing such an exercise as this, I argue one is better able to understand the identity of the Catholic Church.

**Minnerath:** Central to all four Gospels is the call to live radically as a disciple of Christ by being committed to justice and striving to live in solidarity with the

most vulnerable of the world. In this paper I will argue that the lived reality of this call to discipleship demands that U.S., white, economically privileged Catholics avoid reliance on “confessional stagnation” and instead focus on genuine repentance, which eliminates guilt and lends to metanoia. This transition moves Catholics to foster a deeper understanding of privileged statuses, while simultaneously transcending these privileged statuses to move into genuine encounter and continued transformative relationship with those living on the fringes of society.

**Greenstein:** At the core of Catholic health care ministry lays a steadfast purpose of bringing to life Jesus’ mission of love and healing. In today’s ever-changing healthcare landscape, Catholic U.S. hospitals have undergone a change in their mission and thus their identity. This presentation argues that Catholic hospitals need to rediscover the origins of their ministry. This can be accomplished by refocusing their efforts away from mergers with secular entities that deal strictly with life and death issues to mergers that more fully engage the care for the poor and vulnerable

**Vievering:** The Catholic Church rightly recognizes the power of the family. The Second Vatican Council states, “The mission of being the primary vital cell of society has been given to the family by God.” Families actualize individuals’ potential to love and seek justice. However, the family faces significant struggles. Divorce rates remain high, many leave the church, significant populations live in poverty, and individualism pervades our society. To account for the profound undertaking bestowed upon the family, the Church must provide ministry that encourages social, economic, and cultural transformation within the home and guides the family in promoting the common good.

**Cleary:** A troubling and often over-looked problem in American society today is sexual assault. While the consequences are severe for the victim of sexual assault, they can also be extremely damaging to communities as well, especially communities of faith. When survivors are part of a faith community, how that community talks about suffering and forgiveness could either lift the survivor up or cause more self-blame and pain. The current way the Catholic Church speaks about suffering and forgiveness can be great sources of pain to survivors. A change in the language of how we talk about these two concepts is essential to make the Church a place of hope and healing for survivors. By using feminist understandings of suffering and forgiveness, the Church can become a necessary place of healing for survivors of sexual assault.

**Klonowski:** In the United States, our neighbor is Latin America, an area of the world broken by conflict and corruption and whose people seek peace and prosperity, occasionally through migration to this country. Our reception of immigrants from this region, however, is not in accord with the appeals Pope Francis and the Church make of us. This paper argues that in the face of this ever-widening chasm between the obligation from Catholic teaching to welcome

the immigrant in our midst and the reality of apathy, ignorance, and even hostility towards immigrants, Catholics must be reminded of our deep involvement in Latin American history, and our responsibility to create a future of possibility for all persons migrating from this area because we share “dangerous memories.”

**Torgerson:** This paper addresses the multifaceted issue of divine impassibility. It tracks the early church teaching surrounding impassibility, the modern resurgence of the issue, and some important practical and pastoral approaches. By doing so, this paper suggests that the real argument is not about whether or not God suffers. In fact, I do not suggest that we should think one way or the other about impassibility. Rather, this paper frames the issue of impassibility as a discussion about how we experience suffering, healing, and redemption through a God we can know and worship.

**Martin:** Climate refugees are growing in population due to rising sea levels, increasing water stress in some areas, and they do not have proper mechanisms in place to provide assistance. Many theologians are concerned with the environment in their studies, as well as with migration, but their work has been inadequate in the area of climate refugees. I hope to provide a theological position on this issue which possesses sociological, political, and deeply human experience.



## Natural Sciences Presentations:

### Physics

#### Schedule

2:00 - 2:30 PM

*PEngl 167*

Grant Daniel (Gregory Taft, Physics) Thermal Stabilization and Pulse Compression of a Ti:sapphire Laser

2:30 - 3:00 PM

*PEngl 167*

Cathleen M. Gross (Todd Johnson, Physics) Designing an Interferometer to Evaluate Laser Interference

3:00 - 3:30 PM

*PEngl 167*

Amanda Jendro (Todd Johnson, Physics) Visible Vibrations of an Oboe Reed

#### Abstracts

**Daniel:** Femtosecond lasers are used for researching ultrafast processes in materials, as well as for new practical applications like micromachining and surgery. Although the pulses from these lasers have a relatively small amount of energy, the ultrashort pulse durations result in the extremely large peak intensities needed for applications. In order for a femtosecond laser to be most useful for applications and research, the shortest possible pulse duration and maximum output power stability are desired. The duration of a laser pulse increases when it interacts with components both inside and outside the laser, like mirrors, prisms and beamsplitters, so a method to compress the pulse is needed to make the pulse more useful. The aim of this research was to increase the usefulness of a Ti:sapphire laser by building a device to shorten the duration of the output pulse and by increasing the stability of the laser output power. The results show an incremental increase in long-term power stability each time one of the laser mirror mounts or prism mounts were replaced with ones having fewer degrees of freedom and less mechanical hysteresis. These and other stability improvements resulted in the ability to perform a “cold start” of the laser that required no adjustment to the laser to reach maximum power output after thermalization. A prism-pair pulse compressor was constructed to use refraction and geometry to compensate for the pulse lengthening caused by the components inside and outside of the laser. Measurement of the compressed output pulse showed a pulse duration of  $24.3 \pm 0.2$  femtoseconds, which was about 7 times shorter than the uncompressed pulse duration.

**Gross:** In this research project, an interferometer was developed and interference measurements were taken using a red, 632.8 nm laser. The system was

constructed with six mirrors, a beam splitter, a platform oscillating at resonance, and an adjustable track to vary the path length. An observed 5.96% of the ideal minimum to maximum constructive and destructive interference was recorded. The smaller observed range shows a strong dependence of intensity on total beam alignment and various other design factors.

**Jendro:** This experiment examines the complicated vibrations of an oboe reed while it was vibrating due to a process known as 'crowing'. Since a controlled process of this playing method is not possible, a synthetic setup was created to simulate the crowing of an oboe reed in the mouth. A wet oboe reed was then placed in a clear, acrylic box which was then pressurized to approximately the same pressure an oboist uses to play a reed. This pressure caused the open reed to vibrate as it would when crowded in the mouth. Through use of a microphone and oscilloscope, it was determined from Fourier transforms of the signals that the reed was vibrating at a frequency that varied from that of a standard oboe reed when crowded. Measurements were then taken of the acrylic box and it was determined that the vibrations of the oboe reed were interacting with the resonance of the acrylic box, causing the reed to vibrate at this different frequency. Advances were made towards direct visual observation of the vibrating oboe reed.

## **Social Sciences Presentations:**

### **Accounting & Finance**

#### **Schedule**

*12:10 - 12:30 PM*

*Simns 310*

Michael P. Callanan (Warren Bostrom, Accounting & Finance) State Taxes

*12:10 - 12:30 PM*

*Simns 330*

Brooke J. Oraskovich (Warren Bostrom, Accounting & Finance) Non-Profit CEO Compensation Fairness

*12:10 - 12:30 PM*

*Simns 340*

Hongye Wang (Warren Bostrom, Accounting & Finance) Benefit for working in accounting and Financial Industry

*12:30 - 12:50 PM*

*Simns 330*

Mathew R. Rogers (Warren Bostrom, Accounting & Finance) Non-profit Advertising Costs

*12:30 - 12:50 PM*

*Simns 340*

Sarah M. Rathbone (Warren Bostrom, Accounting & Finance) Happiness and Stress within Accounting/Finance Careers

*12:30 - 12:50 PM*

*Simns 340*

Sarah M. Rathbone (Warren Bostrom, Accounting & Finance) Happiness and Stress within Accounting/Finance Careers

*12:30 - 12:50 PM*

*Simns 310*

Fieasha Johnson (Warren Bostrom, Accounting & Finance) The Cost of Doing Femininity: Pink Taxes and Gender Price Discrimination

*1:00 - 1:20 PM*

*Simns 330*

Kelsey Cavanaugh (Warren Bostrom, Accounting & Finance) The Effect of Student Debt on Students and the Economy

*1:00 - 1:20 PM*

<i>Simns 340</i>	Xiaorui Yang (Warren Bostrom, Accounting & Finance) The best auditor in the big four accounting firms
<i>1:00 - 1:20 PM Simns 310</i>	Bowen Zheng (Warren Bostrom, Accounting & Finance) How video game industry influence the large technology companies
<i>1:20 - 1:40 PM Simns 330</i>	Nicholas Simon (Warren Bostrom, Accounting & Finance) Parenting and the Success of Children
<i>1:20 - 1:40 PM Simns 310</i>	Chad D. Christenson (Warren Bostrom, Accounting & Finance) The Cost of Racing
<i>1:20 - 1:40 PM Simns 340</i>	Matthew D. Schmid (Warren Bostrom, Accounting & Finance) Too Big to Fail
<i>1:40 - 2:00 PM Simns 310</i>	Joseph M. Twohy (Warren Bostrom, Accounting & Finance) The Financial Impact of Music Streaming Services
<i>1:40 - 2:00 PM Simns 340</i>	William J. Nash (Warren Bostrom, Accounting & Finance) Stock returns of sustainable companies
<i>1:40 - 2:00 PM Simns 340</i>	Reid Bjorklund (Warren Bostrom, Accounting & Finance) Education rates and Income Inequality
<i>2:00 - 2:20 PM Simns 330</i>	Paoliang Yang (Warren Bostrom, Accounting & Finance) Accounting and Happiness: Non-Profit/Governmental Vs. For-Profit Entities
<i>2:00 - 2:20 PM Simns 310</i>	Grant Latanision (Warren Bostrom, Accounting & Finance) Accounting for Zoo Animals
<i>2:00 - 2:20 PM Simns 340</i>	Shuai Yuan (Warren Bostrom, Accounting & Finance) Electronic Commerce

6:00 - 6:20 PM

*Sextn Pub*

Courtney L. Helmin (Warren Bostrom, Accounting & Finance) Work-Life Balance

6:30 - 6:50 PM

*Sextn pub*

Genessis Gastelum Lopez (Warren Bostrom, Accounting & Finance) The Path to Becoming a Fortune 100 CEO

7:00 - 7:20 PM

*Sextn Pub*

Tyler Thell (Warren Bostrom, Accounting & Finance) How important are franchise films to Hollywood studios?

7:00 - 7:20 PM

*Sextn Pub*

Paul R. Wageman (Warren Bostrom, Accounting & Finance) The Impact of Studying Abroad on Career Earnings

7:30 - 7:50 PM

*Sextn Pub*

Maria R. Freking (Warren Bostrom, Accounting & Finance) Audit vs. Tax

## **Abstracts**

**Callanan:** I will be looking at state tax revenue and how different states tax revenue was effected by recession.

**Oraskovich:** Non-Profits face scrutiny on high CEO compensation. I will address the fairness relationship between non-profit CEO compensation and program expenses, which serve the non-profit's mission.

**Wang:** I am going to do a presentation about benefit for working in accounting and financial industry

**Rogers:** The projects looks at the correlation between revenue and advertising costs in the non-profit sector. The project seeks to answer, does an increase in advertising help a nonprofit increase their annual revenue? The presentation will divide up the correlations by the following non-profit sectors: veterans, healthcare, food, and other.

**Rathbone:** In this presentation you'll learn about how happy individuals are with their career in Accounting/Finance based off of their stress levels at work.

**Rathbone:** In this presentation you'll learn about how happy individuals are with their career in Accounting/Finance based off of their stress levels at work.

**Johnson:** The Pink Tax Situation in America involves females paying more than their male counterparts for similar quality goods and services. My research explores some ways it is more costly to be a woman in America, specifically in the online retail market. The goal of my research is to estimate the price differences male and female shoppers face when buying the same types of items. I visited popular online stores and compared 100 products of the same brand with clear male and female versions and discovered that in some cases products market to women are more costly.

**Cavanaugh:** As student debt balance continues to increase, so does its impact on individual students' choices before, during, and after college. As these students graduate and enter the job market their choices further impact economic growth.

**Yang:** My project shows who the best big four accounting firm is by giving existing researches and closely analyzing the historical audit fees of Fortune 100.

**Zheng:** How the video game segment made the profits of the large technology companies change in past 5 years.

**Simon:** An analysis of the impact of parenting styles on the success of the children in that family. Specifically, I will be examining helicopter parenting and the possible added stress that could add to the child's life and impact their future success.

**Christenson:** My research topic is into the costs of becoming a professional race car driver. I will be analyzing the costs of a drivers' history from each of the top three professional circuits, Formula One, NASCAR and Indy Car.

**Schmid:** This research project analyzes the size of U.S. Banks from a global perspective.

**Twohy:** The music industry has undergone major changes in the past decade. This project examines the financial impact of music streaming services on artists as well as the music industry as a whole.

**Nash:** I will be looking at the stock returns of sustainable companies vs. the market as a whole.

**Bjorklund:** I will be analyzing the relationship between education rate and the income inequality gap both in the US and around the world.

**Yang:** This is a presentation on the research conducted through surveying accounting professionals about their overall happiness at work. The research

compares happiness within non-profit/governmental and for-profit entities, and explains the reasons behind happiness at work.

**Latanision:** Accounting for Zoo animals—the most important asset missing from the balance sheet. Why isn't the Zoo or Aquarium's most important asset on their financial statements?

**Yuan:** My project is about the future trends of electronic commerce in different countries. I compared the top ten countries that has the biggest electronic commerce market in 2014 and analyze their future trends by considering each country's population growth and total GDP amount and GDP per capita to forecast their future trend.

**Helmin:** My presentation will discuss the relationship between accounting careers and work-life balance.

**Gastelum Lopez:** This research project looks into the education and career paths of the CEOs of the top 100 companies in the 2015 Fortune 500 list. I analyzed and compared the CEOs' educational and professional backgrounds to determine if there is a specific path that increases a person's chance of becoming a Chief Executive Officer.

**Thell:** A look at how important franchise films have become for the major Hollywood studios financial statements.

**Wageman:** The purpose of this project was to determine whether or not studying abroad is correlated with higher career earnings. Data was collected by surveying about 7,000 people, most of whom were Minnesota CPA's.

**Freking:** I am researching which public accounting service line is the best choice for students to choose after graduation, audit or tax. I am analyzing a variety of factors that affect this decision in order to help students make the best choice for themselves.

## **Education**

### **Schedule**

*1:00 - 1:20 PM*  
*HAB 117*

Danielle M. Schlender (Jeanne Cofell, Education) The Birds, The Bees, and Social Equity - An Analysis of how Sex Education Affect Views of Gender

### **Abstracts**

**Schlender:** While our conversations regarding feminism have become more frequent and inclusive to discussing what feminism is to all genders and cultural backgrounds, there is still a lot of work to be done on the very serious matters of objectification, sexual assault and rape culture. Many are asking what can be done to resolve the sexual violence epidemic that is a sad truth to the daily experiences of people all over the country. Many suggest that education is the best tool that we have to not only educate the people who are involved now, but also the future generations. It was Nelson Mandela who once said, “education is the most powerful weapon which you can use to change the world,” and it is my belief that better sex education can be a powerful tool to change violent and objectifying attitudes towards women and sex to a nonviolent and healthy reality. In this presentation, I examine current methods of sex education and analyze how general curricular trends address issues of gender, consent, and sexual violence. I also present ideas to ratify current curriculums so that they can address these issues in a safe productive environment.

## **Global Business Leadership**

### **Schedule**

*3:00 - 3:30 PM*

*Simms G30*

Precious Drew, Ingrid Pfefferle, Allison Steen, Nick Liemandt, Joseph Nolan (Stephen Schwarz, Global Business Leadership) Society for the Advancement of Management Case Competition

### **Abstracts**

**Drew, Pfefferle, Steen, Liemandt, Nolan:** The Society for the Advancement of Management consists of a team of five students that compete in an annual case competition. In January, this team was assigned to a business case study on the Target Corporation. The students are required to research the company and industry in order to develop/justify strategy recommendations for the company. Students participating in this program will be traveling to Washington DC in April 7-10 to present these recommendations to a panel of judges and compete in a case research competition. The S.A.M. team will be sharing the results of their research and the experience of participating in this program.

## **Political Science**

### **Schedule**

*1:00 - 1:15 PM*

*Simms 360*

Zack Eichten (James Read, Political Science) Student Accessibility Services Office Space and Relocation



*1:15 - 1:30 PM*

*Simns 360*

Grant Anderla (James Read, Political Science)  
American Policy on Japanese Militarization Efforts

*1:30 - 1:45 PM*

*Simns 360*

Meghan Mullon (James Read, Political Science)  
Climate Change and Public Health in Minnesota

*1:45 - 2:00 PM*

*Simns 360*

Rebecca Timmons (James Read, Political Science)  
Effective Drug Court Program for Douglas County,  
Wisconsin

*2:00 - 2:15 PM*

*Simns 360*

Brendan Klein (James Read, Political Science)  
Employing Urban Youth to Fight Climate Change

*2:30 - 2:45 PM*

*Simns 360*

Abigail Boadu (James Read, Political Science)  
Improving Maternal and Child Health in Ghana

*2:45 - 3:00 PM*

*Simns 360*

Bethany Purkapile (James Read, Political Science)  
Women's Disadvantages Under No-Fault Divorce

*3:00 - 3:15 PM*

*Simns 360*

Jarol Torres (James Read, Political Science) Body  
Cameras for Los Angeles Police Officers

*3:15 - 3:30 PM*

*Simns 360*

Collin Joyce (James Read, Political Science) The  
Philippines: Conflict Resolution Through Literacy

## **Abstracts**

**Eichten:** Student Accessibility Services Office Space and Relocation - Dr. Jim Read's POLS 114 - Public Policy Analysis students will diagnose a public policy problem and recommend a specific course of action to address that problem.

**Anderla:** American Policy on Japanese Militarization Efforts - Dr. Jim Read's POLS 114 - Public Policy Analysis students will diagnose a public policy problem and recommend a specific course of action to address that problem

**Mullon:** Climate Change and Public Health in Minnesota - Dr. Jim Read's POLS 114 - Public Policy Analysis students will diagnose a public policy problem and recommend a specific course of action to address that problem

**Timmons:** Effective Drug Court Program for Douglas County, Wisconsin - Dr. Jim Read's POLS 114 - Public Policy Analysis students will diagnose a public policy problem and recommend a specific course of action to address that problem

**Klein:** Employing Urban Youth to Fight Climate Change - Dr. Jim Read's POLS 114 - Public Policy Analysis students will diagnose a public policy problem and recommend a specific course of action to address that problem

**Boadu:** Improving Maternal and Child Health in Ghana - Dr. Jim Read's POLS 114 - Public Policy Analysis students will diagnose a public policy problem and recommend a specific course of action to address that problem

**Purkapile:** Women's Disadvantages Under No-Fault Divorce - Dr. Jim Read's POLS 114 - Public Policy Analysis students will diagnose a public policy problem and recommend a specific course of action to address that problem

**Torres:** Body Cameras for Los Angeles Police Officers - Dr. Jim Read's POLS 114 - Public Policy Analysis students will diagnose a public policy problem and recommend a specific course of action to address that problem

**Joyce:** The Philippines: Conflict Resolution Through Literacy - Dr. Jim Read's POLS 114 - Public Policy Analysis students will diagnose a public policy problem and recommend a specific course of action to address that problem.

## **Sociology**

### **Schedule**

*1:00 - 2:00 PM*

*Simms G40*

Fabian Crisanto, Laura Lanigan, Pakou Vang, Padra Xiong, Vivien Arredondo, Mapy Mejia Florez (Jessica O'Reilly, Sociology) A Taste of Culture - Documentary Film Presentation

*1:00 - 2:00 PM*

*Simms G40*

Brianna Rimas, Olayemi Fadahunsi, John Peeples, Diana Elhard (Jessica O'Reilly, Sociology) How do I get there?: An introduction to public transportation in St. Cloud, Minnesota - A Documentary Film

*1:00 - 2:00 PM*

*Simms G40*

Rachel Tretter, Nicole Kelley, Felicia Mix, Kristin Nelson (Jessica O'Reilly, Sociology) Cultural Healing:

Understanding the Meaning of Health Across Cultures -  
A Documentary Film

1:00 - 2:00 PM

*Simns G40*

Madi Lacy, Katie Langer, Frankie Hanson, Aaron Piecukonis, Chance Laidly (Jessica O'Reilly, Sociology) Social Services and Education of Somali Immigrants - A Documentary Film

1:00 - 2:00 PM

*Simns G40*

Ally Nelson, Allie Rudnickas, Gao Moua, Erin Ryan-Mosley, Mychie Yang, Malia Carson (Jessica O'Reilly, Sociology) From Strangers to Brothers: Stories of Monastic Migration at St. John's Abbey - A Documentary Film

2:00 - 2:15 PM

*Simns G40*

Michelle Hansmann (Sheila Nelson, Sociology) Understanding the Motivations for and Perceptions of Interfaith Collaboration Among Religious Leaders

2:15 - 2:30 PM

*Simns G40*

Chayce Kenny (Jessica O'Reilly, Sociology) Environmental Determinism in Euro-American/American Indian Relations from Jamestown to the 21st Century

## Abstracts

**Crisanto, Lanigan, Vang, Xiong, Arredondo, Mejia Florez:** A Taste of Culture:

Dr. Jessica O'Reilly's SOCI 322 Transnational Anthropology class presents their documentary films containing original ethnographic research analyzing a particular transnational cultural case study.

**Rimas, Fadahunsi, Peeples, Elhard:** How do I get there?: An introduction to public transportation in St. Cloud, Minnesota

Dr. Jessica O'Reilly's SOCI 322 Transnational Anthropology class presents their documentary films containing original ethnographic research analyzing a particular transnational cultural case study.

**Tretter, Kelley, Mix, Nelson:** Cultural Healing: Understanding the Meaning of Health Across Cultures - Dr. Jessica O'Reilly's SOCI 322 Transnational

Anthropology class presents their documentary films containing original ethnographic research analyzing a particular transnational cultural case study.

**Lacy, Langer, Hanson, Picukonis, Laidly:** Social Services and Education of Somali Immigrants - Dr. Jessica O'Reilly's SOCI 322 Transnational Anthropology class presents their documentary films containing original ethnographic research analyzing a particular transnational cultural case study.

**Nelson, Rudnickas, Moua, Ryan-Mosley, Yang, Carson:** From Strangers to Brothers: Stories of Monastic Migration at St. John's Abbey - Dr. Jessica O'Reilly's SOCI 322 Transnational Anthropology class presents their documentary films containing original ethnographic research analyzing a particular transnational cultural case study.

**Hansmann:** This presentation will share the results of an exploratory study examining reasons why religious leaders participate in interfaith collaboration. I conducted in-depth interviews with religious congregational leaders in Minneapolis and St. Paul, Minnesota, in an attempt to identify the professional and personal motivations, and the organizational pressures influencing participation. Interfaith collaboration consists of intentional constructive cooperation and positive interactions between individuals or institutions of different religious traditions. Interfaith initiatives occur throughout the world at the local, national, and international level. Despite the growing increase in faith-based collaborations, there has been little research examining why religious leaders and congregations choose to participate in interfaith collaboration, and this research attempts to address this question. Ten religious leaders representing eight different religious traditions participated in this study. Join me for my presentation to learn about the factors that were found to facilitate interfaith collaboration as well as the unexpected factors found to inhibit participation in interfaith collaboration.

**Kenny:** Although it was not until recently that the United States public began to focus on our relationship with the natural world and how we see and use natural resources, the environment has always served as more than a passive backdrop in the history of this country. In some of the earliest years of colonization, the environment of the America's, and the natural resources here, colored the interaction between natives and early colonial communities. Following the earliest interaction, the environment continued to influence intercultural conflicts, governmental policies, expansion and native displacement, and cross-cultural cooperation. In each of the main developments in relationship between natives and Euro-Americans, the environment serves as a major influence. This research project, through combination of anthropological and sociological theory, historic texts, government policy, and current scientific understanding seeks to breakdown some of the complexities regarding the environment and the history of this nation in regards to American Indians.

## **Interdisciplinary Presentations:**

### **Media Services**

#### **Schedule**

*1:00 - 1:30 PM*

*CLEML Creative  
Lab*

Anna Skemp, Kadrian Hill (Kelly Berg, Media  
Services) Johnnie Bennie Media

#### **Abstracts**

**Skemp, Hill:** The Communication major has as one of its goals to develop students' ability to create messages. Communication courses on media aesthetics and media writing, provide a foundation for effective writing, planning and editing of messages for target audiences in varied channels. Johnnie Bennie Media is a student-run media organization that extends knowledge from the classroom and strives to provide applied learning opportunities for students who produce relevant and creative media content for the CSB and SJU communities. By creating online video and audio programs, Johnnie Bennie Media is dedicated to fostering media literacy as part of the organization's partnership with Media Services and the Libraries. Join the managers of Johnnie Bennie Media as they discuss the four branches of the organization, how they are applying and learning at the same time, and learn about their current projects and future plans.

