4-12-2014

2014 Undergraduate Research Symposium Abstract Book

Academic Center for Enrichment

The URS Organizing Committee would like to thank the students for participating in this year's symposium.

Additional thanks to:
Chancellor Jacqueline R. Johnson
Dean Bart Finzel
Vice President of Research Brian Herman
Matt Zaske
Jerry Danelke
Kourtni Danielson
Lynn Halbakken Tatge
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Ann Williams
Duplicating Services
Facilities Management
Sodexo
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And all the faculty for advising the projects and providing encouragement.

Without the above people, this event would not have happened.

The 2014 URS Review Committee
Jayne Blodgett, Peter Bremer, Siobhan Bremer, Kourtni Danielson, Becca Gercken, Chris Hagains, Elena Machkasova (co-chair), Elizabeth Pappenfus, Ted Pappenfus, Jimmy Schryver (co-chair), Roger Rose, and Heather Waye

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UNIVERSITY OF MINNESOTA, MORRIS
2014 UNDERGRADUATE RESEARCH SYMPOSIUM

Featuring Student Research, Creative, and Scholarly Work from across Campus

SATURDAY, APRIL 12, 2014

PROGRAM BOOK AND SCHEDULE

The 2014 Fourteenth Annual UMM Undergraduate Research Symposium (URS)
celebrates student scholarly achievement and creative activities.
Students from all disciplines participate in the URS.
Types of presentations include posters, oral presentations, and short or
abbreviated theatrical, dance, or musical performances.
Presentations are accompanied by discussions and multimedia.

Program Index

Program Index

The University of Minnesota, Morris
—2014—
UMM Undergraduate Research Symposium
Featuring student research, creative, and scholarly work from across campus

Saturday, April 12, 2014

9:30 a.m.—2:00 p.m.	Registration, Student Center and John Q. Imholte Hall
9:30 a.m.—11:00 a.m.	Poster/Visual Display, Oyate Hall
10:00 a.m.	Welcome, Jimmy Schryver, URS Co-chair and Jacqueline Johnson, Chancellor, Oyate Hall
11:00 a.m.—12:00p.m.	Oral Presentations, Science Building, Rooms #1020, 1030, 2200
11:00 a.m.—12:00p.m.	Performance Presentations, Edward J. & Helen Jane Morrison Gallery HFA Recital Hall #160
12:00 p.m.—1:00p.m.	Lunch, Dining Hall (or on your own)
1:15 p.m.—1:30 p.m.	Welcome, Bart Finzel, Vice Chancellor for Academic Affairs and Dean; Brian Herman, University of Minnesota Vice President for Research HFA Recital Hall #160
1:30 p.m.	Introduction of Feature Presentation, Peh Ng, Chair, Division of Science and Mathematics, and Professor of Mathematics
1:30 p.m.—2:15 p.m.	Feature Presentation, HFA Recital Hall #160 Reid Ronnander "Markov Chain Algorithmic Composition with Musical Form"
2:30—3:30 p.m.	Performance Presentations, Black Box Theatre
2:30—4:30 p.m.	Oral Presentations, John Q Imholte Hall, Room #s: 111, 112, 113, 114

ORAL PRESENTATIONS
Science and Math Building, Room #s 1020, 1030, and 2200

Room #1020

11:00 Andrew Latterner (Computer Science): **Applying Machine Learning Techniques to Campus Energy Use and Production** (Adviser: Nic McPhee), abstract pg. 22
11:20 Julie Arhelger (English): **Stop Teaching Grammar: A Grammar Nerd's Proposal for Fostering Literacy in the Writing Classroom** (Adviser: Tisha Turk), abstract pg. 12
11:40 Danielle Brown (English): **Genocide: Conditions Behind Mass Murder** (Adviser: Michael Lackey), abstract pg. 13

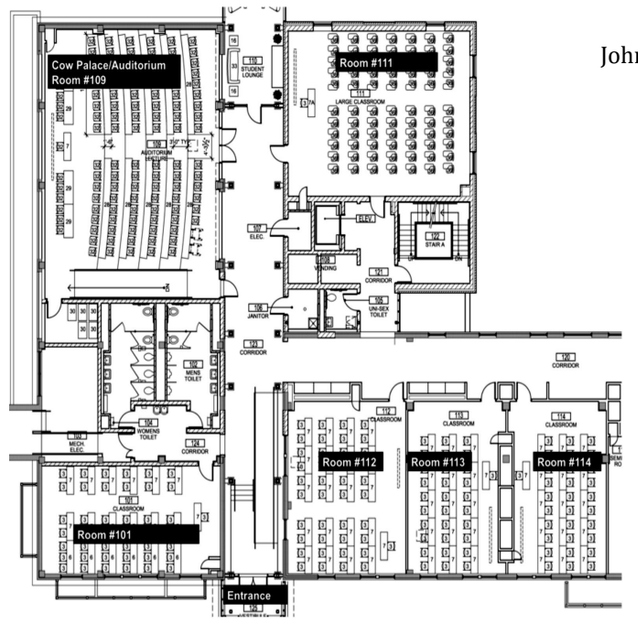
Room #1030

11:00 Justin Irlbeck (Mathematics): **Estimating Parameters in a Continuous Dynamical System** (Adviser: Barry McQuarrie), abstract pg. 18
11:20 Wesley Brand (Philosophy): **Time Out! Impassable Barriers to Time without Change** (Adviser: Pieranna Garavaso), abstract pg. 13
11:40 Tessa Hagen (Philosophy): **The Particularities of Personhood: A Response to Elizabeth V. Spelman's "On Treating Persons as Persons"** (Adviser: Pieranna Garavaso), abstract pg. 17

Room #2200

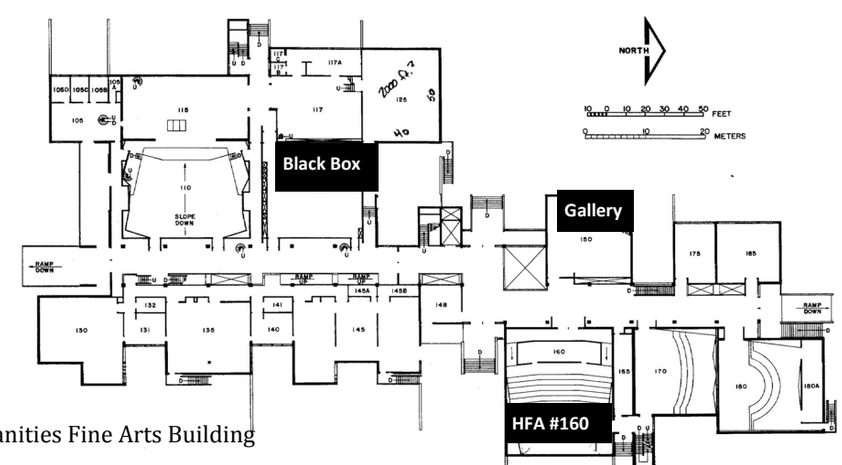
11:00 Sam Daniewicz (Psychology): **Attitudes towards Drug and Alcohol Use: Culture and Emerging Adulthood** (Adviser: Oscar Baldelomar), abstract pg. 15
11:20 Patrick Malone (Economics): **Child Health and Household Income** (Adviser: Bibhudutta Panda), abstract pg. 23
11:40 Elizabeth Pappenfus (Psychology): **Latinos' Health Perceptions: A Cross-Cultural Analysis** (Adviser: Oscar Baldelomar), abstract pg. 25

2014 Undergraduate Research Symposium



John Q. Imholte Hall, 1st Floor

Oral Presentations

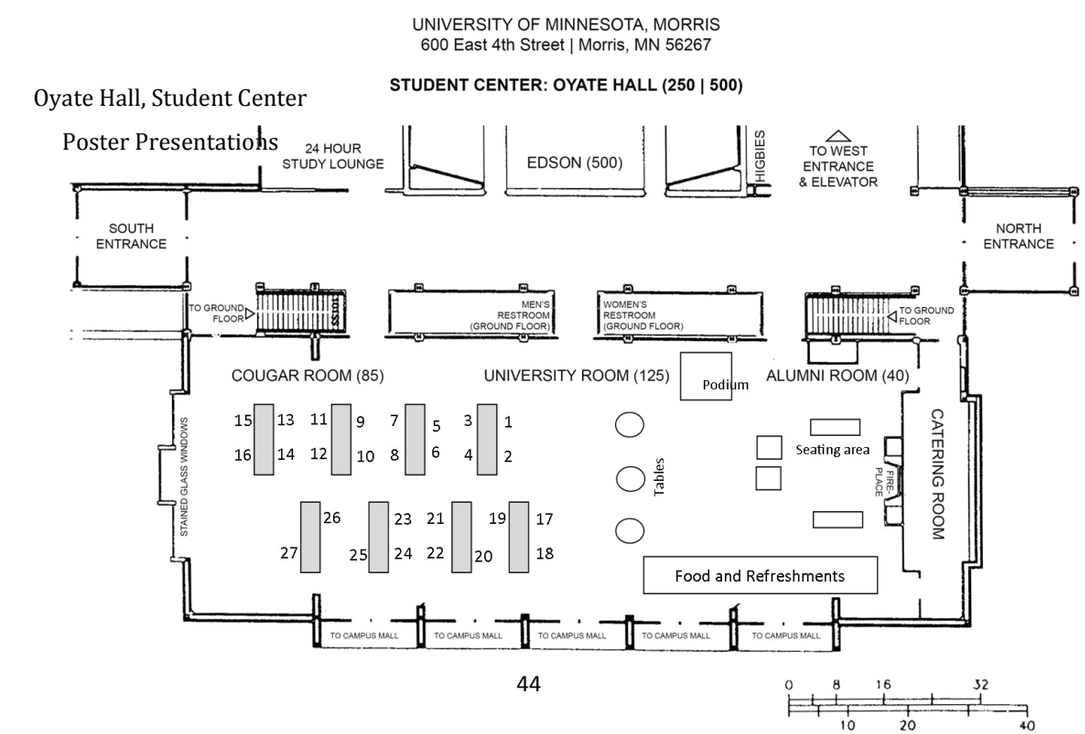


Humanities Fine Arts Building

Performance Presentations

Presenters: Alice Toll and Nicole Sandback
Project Advisers: Jon Anderson (Statistics), Stephen Burks (Economics and Management), Rebecca Erickson (Center for Small Towns)
Title: Estimating the Impact of Obstructive Sleep Apnea Treatment Compliance and Driver Behavior on Accident Risk in Commercial Drivers.
Type of Presentation: Poster or Visual Display #13

Obstructive sleep apnea is a condition that disrupts restful sleep and causes daytime fatigue. Through a partnership with a major truckload carrier company, we received weekly driving records for over 2000 drivers who had been tested for obstructive sleep apnea between January 2005 and December 2009. On the basis of driving experience and tenure, these drivers were matched retrospectively to control drivers who had not been tested for OSA but were unlikely to have the disease as indicated by preliminary screening results. The employer mandated drivers who tested positive for obstructive sleep apnea comply with continuous positive airway pressure treatment under the threat of termination in order to prevent drowsiness related accidents. Transmission of treatment hours allowed us to classify drivers into self-selected treatment compliance groups. Our results have shown that drivers who never comply with treatment have over four times the risk of having a Department of Transportation reportable accident when compared to undiagnosed controls. Initial results indicate that this increase in risk may not be due to a lack of treatment, but instead a behavioral component under the assumption that a disregard for medical advice is related to a disregard for safe driving habits. Regardless of the cause of increased accident risk, requiring the commercial driver population be tested for obstructive sleep apnea and follow through with treatment can identify drivers who should be removed from the road.



PERFORMANCE PRESENTATIONS
Humanities Fine Arts Building, Recital Hall #160, and Morrison Gallery

Edward J. and Helen Jane Morrison Gallery

11:00 Sienna Nesser (Studio Art): **The Art of Decomposition: Examining Uncomfortable Materials through the Comfort of Fiber Arts** (Adviser: Jess Larson), abstract pg. 30

HFA Recital Hall #160

11:20 Michael Raynes (Music): **Drip, Drip, Drip: Blood and Bereavement in the Edward Ballade by Johannes Brahms** (Adviser: Ann Duhamel), abstract pg. 31
11:40 Sydney Long with John Malecha and Hannah Palmer (Dance): **Data and Dance: Lose the Words; Get the Picture** (Adviser: Stephanie Ferrian), abstract pg. 30

ORAL AND PERFORMANCE PRESENTATIONS
Humanities Fine Arts Building, Black Box Theatre

Black Box Theatre

2:30 Abigail Thebault-Spieker (Theatre): **The Dramaturgical Process for "Uncommon Women": Feminist Issues in the 1970's** (Adviser: Ray Schultz), abstract pg. 28
2:45 Matthew McDonough (Theatre): **Process of Doing a Sound Design for a Theatrical Show** (Adviser: Ray Schultz), abstract pg. 23
3:00 Sarah Hanson (Theatre): **Stage Management: A Case Study of "Uncommon Women"** (Adviser: Ray Schultz), abstract pg. 17
3:15 Lindy Jackson (Theatre): **The Research and Methods for Playing Kate Quin in UMM's Theatre Production "Uncommon Women and Others"** (Adviser: Ray Schultz), abstract pg. 19

ORAL PRESENTATIONS
John Q. Imholte Hall, Room #s 111 and 112

Room #111

2:30 Natalie Hoidal and Jordan Wente (Art and Spanish): **Estar in el Prairie** (Adviser: Gary Wahl), abstract pg. 18

2:50 Josh Lozancich (Political Science): **Finland's NATO Dilemma: The Question of NATO Membership** (Adviser: Seung-Ho Joo), abstract pg. 22

3:10 Adiroopa Mukherjee (Pre-Law, Human Rights, and Sociology): **The Battle against Female Genital Mutilation** (Adviser: Farah Gilanshah and Roger Rose), abstract pg. 24

3:30 Michael Prideaux (Philosophy and Gender, Women, and Sexuality Studies): **The Pink Rope: Feminism, Sex Positivity and the Morality of BDSM** (Adviser: Dan Demetriou), abstract pg. 26

3:50 Arundathi Rao (Sociology): **Understanding Ethnic Conflict in Africa through Studying the Histories of Rwanda and Sudan** (Adviser: Farah Gilanshah), abstract pg. 26

4:10 Rachel Balzar (English): **"Bridging [the] generational gaps": An Examination of M. Carl Holman's Role in the Haverford Discussions** (Adviser: Michael Lackey), abstract pg. 12

Room #112

2:30 Yuyan Chen (Psychology): **An Examination of Global Identity in College Students** (Adviser: Oscar Baldelomar), abstract pg. 15

2:50 Rachel Kollar (Art History): **Modernist Portraiture: Gertrude Stein and Pablo Picasso** (Adviser: Joel Eisinger), abstract pg. 20

3:10 Erica Mumm (Biological Psychology): **Genetic Mutation vs Infectious Disease: Aid from an Unexpected Place** (Adviser: Leslie Meek), abstract pg. 25

3:30 Katie Jacobson (Economics): **Economic Underpinnings of Renaissance Italian Art** (Adviser: Bart Finzel), abstract pg. 19

3:50 Megan Fitzgerald (Art History): **Rembrandt: The Practice of a Printmaker** (Adviser: Julia Dabbs), abstract pg. 16

4:10 Aubrey Thole (Art History): **Finding the "True" Titian** (Adviser: Julia Dabbs), abstract pg. 28

Presenters: Aubrey Thyen and Julie Bonham
Project Adviser: Timna Wyckoff (Biology)
Title: Cell Shape Determination in Helicobacter Pylori: Characterizing the Roles of Csd1 and Csd2
Type of Presentation: Poster or Visual Display #8

Helicobacter pylori (H. pylori) is a gastric bacterial pathogen that colonizes 50 percent of the world's human population. Infection with H. pylori has been linked to stomach ulcers and gastric cancer. The helical shape of the bacterium allows it to colonize the gastric mucosa, thus avoiding the acidity of the stomach. Understanding how H. pylori generates cell shape is important because it could lead to the development of targeted antibacterial therapy. Previous research has shown that cell shape determining (Csd) proteins, of which eight are currently known, modify the H. pylori cell wall to give the cell curve and twist. Evidence suggests that Csd1 and Csd2 are two proteins that work to create twist. Since Csd1 is unstable in the absence of Csd2, we hypothesize that Csd2 may be a scaffold protein that stabilizes and directs Csd1 hydrolysis of the cell wall. In order to test this hypothesis, we made single amino acid active site residue point mutations in both Csd1 and Csd2 and analyzed the effects on protein stability and the cell shape of H. pylori. We will highlight the shapes of some of these H. pylori mutants on the poster.

Presenter: Ellen Titus
Project Adviser: Heather Waye (Biology)
Title: Tiger Salamander Distribution in Prairie Pothole Ponds
Type of Presentation: Poster or Visual Display #7

Studies have been conducted across the country to determine how much of a "buffer zone" is required around pond habitats for the successful reproduction of amphibians. The objective of my experiment was to determine how the larval forms of tiger salamanders react to human disturbances within the advised buffer zones. Tiger salamanders (Ambystoma tigrinum), a hardy and widely distributed species across the North American continent, require ponds to breed and raise larvae. In this study, I worked with three ponds; one pond which bordered a field, one which bordered a paved road, and a control pond which was more than 50m from a field or paved road. To determine salamander larvae responses, I spread eight baited minnow traps around the pond perimeter and checked them every other day. When larvae were present in the traps, I recorded the location of the trap. I determined that the larvae are less likely to be caught on the edges of the ponds next to the field or road. Distribution of tiger salamander larvae living in these ponds may have intentionally been away from the edges used by humans. This study is relevant for management of Tiger Salamander breeding ponds which are located adjacent to human activity. If at least one edge of a breeding pond has a buffer allowing for the larvae to move away from a disturbance, then the species may be conserved in areas of special concern where full buffer zones cannot be established.

Presenters: Stephen Sorenson, James Froberg, and John Suihkonen
Project Adviser: Gordon McIntosh (Physics)
Title: Cosmic Ray Counts Versus Altitude
Type of Presentation: Poster or Visual Display #4

Our goal for this research was to measure the relationship between the flux of cosmic rays and the altitude during a balloon flight and to interpret the result. Cosmic rays are energetic particles originating from space that barrage earth from all directions. When primary cosmic rays enter the upper atmosphere they collide with molecules creating cascades of secondary particles. Absorption by the atmosphere and particle decay occurs as the secondary particles approach the surface of the earth, so the flux decreases with atmospheric depth. The maximum of cosmic ray flux, the Pfotzer maximum, occurs at about 18 km. Above this altitude the flux is relatively small because fewer secondary particles are produced. To measure the omnidirectional and vertical coincidence flux, Geiger counters were used in conjunction with the balloon communication module and microprocessors. To measure coincidence flux, a circuit's output is activated only when signals from two counters are received within a 20 ms time window. The coincidence measurement of cosmic radiation introduces a solid angle constraint, because we are only sensitive to the portion of the sky that coincides with the geometry of the two Geiger counters. The measurement results in a count rate per solid angle. Analysis of the data supports the existence of the Pfotzer maximum. These results indicate the effectiveness of the atmosphere in protecting the surface of the earth from the ionizing radiation of cosmic rays.

Presenter: Ashleigh Thompson
Project Adviser: Rebecca Dean (Anthropology)
Title: Anthropogenic Transformation at Angel Mounds: Topographic Change of Mound A
Type of Presentation: Poster or Visual Display #27

Angel Mounds (12Vg1) is a Mississippian (AD 1050-1450) ceremonial center and town on the Ohio River. It covers 40 hectares and includes four large platform mounds, lesser earthen mounds, palisade lines, and hundreds of structures. This year's research included excavations of the lower platform of Mound A and the reopening of Mound F, as well as minimally and noninvasive geoarchaeological and geophysical investigations of several additional earthworks on site. The largest platform mound is Mound A which consists of a lower and upper platform that are joined by a conical peak. Earthworks such as Mound A are often portrayed as static since the time of their construction and use; however, change of earthworks over time is rarely discussed. The current study examines topographic changes of the lower platform of Mound A over the past 76 years and the events that may have caused such changes. Preliminary results from a comparison of the 1937 and 2013 surveys of the lower platform indicate that there is a loss of up to 22 cm. Core analysis suggests erosion as the primary agent of change. The change that has occurred in a period of a few decades forces us to consider what could have changed in the hundreds of years since the mound's creation. Overall, the broader impacts of this research are manifold and revolve around historic preservation and conservation practices.

2014 Undergraduate Research Symposium

ORAL PRESENTATIONS
John Q. Imholte Hall, Room #s 113 and 114

Room #113

2:30 Zachary Johnson (English): **Title: Entering a Scholarly Conversation: Writing in Academic Discourse and the Production of Knowledge's in an Undergraduate First Year Classroom** (Adviser: Tisha Turk), abstract pg. 20
2:50 Maria Fleck (Psychology): **Cultural and Social Setting Effects on Attitudes toward Criminal/Deviant Behaviors** (Adviser: Oscar Baldelomar), abstract pg. 16
3:10 Haley Van Cleve (English): **Teaching Access & Agency: Blogging toward Liberatory Feminist Praxis** (Adviser: Tisha Turk), abstract pg. 29
3:30 Carolyn Sibbald (French): **Silences and Secrets: Examining Flashbacks in Moufida Tlatli's "The Silences of the Palace"** (Adviser: Sarah Buchanan), abstract pg. 27
3:50 Mathea Krogstad (Honors): **Introversion and Extroversion: A Study in Societies Through History** (Adviser: Tammy Berberi), abstract pg. 21
4:10 Kelsey Butler (English): **Discourse and the Working-Class Student: Student Voice, Teacher Authority, and Community Engagement** (Adviser: Tisha Turk), abstract pg. 14

Room #114

2:50 Kay Keegan (Dance): **Dance in Higher Education: Journeying Away from the Fine Arts** (Adviser: Stephanie Ferrian), abstract pg. 20
3:10 Travis Moret (Psychology): **Perceptual Differences of Nonverbal Cues Across Cultures** (Adviser: Oscar Baldelomar), abstract pg. 24
3:30 Donavon Cawley (Philosophy): **Transporter Accidents and Personal Identity: The Case of Too Many Rikers!** (Adviser: Pieranna Garavaso), abstract pg. 14
3:50 Heidi Swanson (Philosophy): **Bats, Experience, and Memory: Tension in Nagel's Proposal for Objective Completion of the Self** (Adviser: Pieranna Garavaso), abstract pg. 27
4:10 Amanda Wiener (Psychology): **Perceptions of the Green Consumer: A Cross-Cultural Comparison** (Adviser: Oscar Baldelomar), abstract pg. 29

POSTER PRESENTATIONS 9:30 a.m. - 11:00 a.m.
Oyate Hall, Student Center

#1 Zach Klassen and Josef Wieber (Physics): **Climate Variability and Local Land Use in the Upper Midwest** (Adviser: Sylke Boyd), abstract pg. 37

#2 Stephen Sorenson and James Froberg (Physics): **Data Collection and Analysis on Halo Displays Using an All-Sky Camera** (Adviser: Sylke Boyd), abstract pg. 41

#3 Wesley Brand (Physics): **Comparing Velocity and Oscillatory Parameters of Astrophysical Masers for SiO v=1, J=1-0 and J=2-1 in Long Period Variables** (Adviser: Gordon McIntosh), abstract pg. 32

#4 Stephen Sorenson, James Froberg, and John Suihkonen (Physics): **Cosmic Ray Counts Versus Altitude** (Adviser: Gordon McIntosh), abstract pg. 41

#5 Saesun Kim (Physics): **Virial Coefficients for the Liquid Argon** (Adviser: Micheal Korth), abstract pg. 36

#6 Mitch Patzer (Physics): **Virial Coefficients of a Hard Sphere Fluid** (Adviser: Michael Korth), abstract pg. 39

#7 Ellen Titus (Biology): **Tiger Salamander Distribution in Prairie Pothole Ponds** (Adviser: Heather Waye), abstract pg. 43

#8 Aubrey Thyen and Julie Bonham (Biology): **Cell Shape Determination in Helico bacter Pylori: Characterizing the Roles of CSD1 and CSD2** (Adviser: Timna Wyckoff), abstract pg. 43

#9 Allison Christiansen (Chemistry): **The Effects of Sodium Chloride on Hydrogen Bonds in Water Observed Through Sodium-23 and Proton NMR** (Adviser: Jennifer Goodnough), abstract pg. 33

#10 Travis Beck (Chemistry): **The Relationship of Hydrogen Bonding with Changing Concentrations of Methanol-d3 and Water** (Adviser: Jennifer Goodnough), abstract pg. 32

Presenter: Kirsten Sharpe
Project Adviser: Heather Waye (Biology)
Title: Using Radio Telemetry to Study Habitat Use of Tiger Salamanders in West-Central Minnesota
Type of Presentation: Poster or Visual Display #20

The eastern tiger salamander (Ambystoma tigrinum) can be found throughout much of the eastern half of the United States and while common in some areas, it is considered threatened or endangered in many others. The status of a population can be difficult to determine because terrestrial adults spend much of their time underground. Therefore, not much is known about the status or habitat use of this species in the prairie pothole region of West-Central Minnesota. We used radio telemetry to track individual salamanders to better understand summer and winter movements and habitat use. The information on display presents the data we collected on the movements of salamanders throughout the summer and fall of 2013. Four adult salamanders were each surgically implanted with a radio transmitter and released at the point of capture between July and October 2013. The longest distance traveled to date was 164 meters on 5 August 2013 over 17 hours from one underground retreat to another and summer movements were correlated with rain events. This technique has allowed us to track movement patterns throughout the late summer and will provide information on winter movements and retreat sites. A better understanding of adult habitat use will allow us to develop more appropriate methods for estimating population size and status.

Presenters: Stephen Sorenson and James Froberg
Project Adviser: Sylke Boyd (Physics)
Title: Data Collection and Analysis on Halo Displays Using an All-Sky Camera
Type of Presentation: Poster or Visual Display #2

Systematic observations of atmospheric optical phenomena can reveal much about the physical properties of normally inaccessible layers of the troposphere. This research aims to utilize these optical phenomena for remote observation of atmospheric conditions such as temperature, saturation, origin of the air mass, and etc. These conditions influence the ice crystal shapes, sizes, orientations, and particle densities in cirrus altitude, which in turn affect the color, angular intensity distribution, brightness, and type of optical displays such as halos, perihelia, and pillars. This research project is part of the goal to set up a facility for long-term observation and data collection on frequency and type of optical displays at the University of Minnesota-Morris. An all-sky camera is sampling the sky at regular intervals and producing series of daily images. We present our work on image analysis software for the automatic detection of the presence of common halo-related optical phenomena. This will allow systematic cataloguing as well as data on frequency and seasonal distribution of the various types of displays for our area. In addition, we present our work on a Matlab Simulation correlating the observed angular intensity distribution with the types, sizes, and orientations of ice crystals present in the generating layer. Based on sequences of refraction and reflection processes on the various surfaces of the ice crystal, the exit angle distributions for large numbers of incident rays are compiled. The MatLab program does allow for the investigation of variations in crystal shape and orientation as they affect the scattering properties.

Presenter: Peter Rerick
Project Adviser: Nick Benesh (Psychology)
Title: Perceptions of Love
Type of Presentation: Poster or Visual Display #25

The purpose of this study is to investigate the influence a person's current state of love has on her/his perception of other relationships. The general research question is to test the idea of "knowing love at first sight." Previous research by Aloni and Bernieri (2004) examined love and its effects on perception of another person's relationship, using video clips of couples. They found that while opinions varied widely, participants who had past romantic experience were less accurate in their estimations of other couples' love. Other scholars, such as Forster, Ozelsel and Epstude (2010), found that being primed to think about love (as participants in the current study were) creates a greater likelihood for the halo effect (the perception that one's partner is perfect) to occur. The current study focused on the language used to convey love and whether readers interpret love language differently based on their scores on Sternberg's Triangle of Love and Close Relationship Belief Scale. For the study, participants were asked to think of someone very close to them while filling out the previously mentioned questionnaires. Then they read love letters, rating the writer's relationship on intimacy, commitment, and passion. The trend in the data indicates that those who scored higher on Sternberg's Love Triangle also tend to rate other relationships as more loving. These results would be useful for relationship counselors trying to help someone who has been having persistent problems with relationships.

Presenters: Paul Schliep and Max Magnuson
Project Adviser: Elena Machkasova (Computer Science)
Title: Developing a Graphical Package for an Introductory Computer Science Course
Type of Presentation: Poster or Visual Display #15

This project is a part of an effort on adopting the programming language, Clojure, for an introductory college-level computer science course. Clojure is similar to the programming language Racket currently used in an introductory class at University of Minnesota - Morris but provides better parallel processing and integration with other programming languages that would benefit students in their future careers.The objective of this project is to develop a beginner-friendly library of functions that allows students to write programs that display colors, shapes, and other graphical elements. In order to accomplish this objective, we have designed, written, and tested elements of a software package that provides the desired functionality. Our approach to designing this package is to engage students in a way that focuses on the key concepts of an introductory computer science course such as problem solving and modularity. We hope that the developed graphical package, once completed, will be used for an introductory computer science course. In this presentation, we will discuss the principles of the software we have developed, its structure, and demonstrate an example of using it.

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POSTER PRESENTATIONS 9:30 a.m. - 11:00 a.m.
Oyate Hall, Student Center

#11 Magen Nivison and Maryanna Kroska (Chemistry): **Synthesis of Metal-Organic Frameworks for Peptide Adsorption Studies** (Adviser: Zack Mensinger), abstract pg. 38

#12 Brandon Karels and Travis Beck (Chemistry): **Exploratory GC/MS Chemical Analysis** (Adviser: Ted Pappenfus), abstract pg. 36

#13 Alice Toll and Nicole Sandback (Statistics & Economics): **Estimating the Impact of Obstructive Sleep Apnea Treatment Compliance and Driver Behavior on Accident Risk in Commercial Drivers** (Adviser: Jon Anderson, Stephen Burks, and Rebecca Erickson), abstract pg. 44

#14 Katie Jacobson (Economics): **Economic Underpinnings of Renaissance Italian Art** (Adviser: Bart Finzel), abstract pg. 19

#15 Paul Schliep and Max Magnuson (Computer Science): **Developing a Graphical Package for an Introductory Computer Science Course** (Adviser: Elena Machkasova), abstract pg. 40

#16 David Donatucci and Kirbie Dramdahl (Computer Science): **Analysis of Ancestry in Genetic Programming with a Graph Database** (Adviser: Nic McPhee), abstract pg. 33

#17 Hong Liu, Margaret Miller, and Yejin Cho (Social Science): **Difference in Accident Costs Among Drivers with OSA** (Adviser: Stephen Burks, Jon Anderson, and Rebecca Erickson), abstract pg. 38

#18 Connor Lewis and Amanda Wiener (Statistics): **Moving Ahead by Thinking Backwards: Cognitive Skills, Personality, and Economic Preferences in Collegiate Success** (Adviser: Stephen Burks, Jon Anderson, and Rebecca Erickson), abstract pg. 37

POSTER PRESENTATIONS 9:30 a.m. - 11:00 a.m.
Oyate Hall, Student Center

#19 Tiwaloluwa Ajibewa (Kinesiology): **Correlation Among Field and Laboratory Tests of Balance in Healthy Adults** (Adviser: Joseph Alia), abstract pg. 31

#20 Kirsten Sharpe (Biology): **Using Radio Telemetry to Study Habitat Use of Tiger Salamanders in West-Central Minnesota** (Adviser: Heather Waye), abstract pg. 41

#21 Alayna Johnson, Aaron Goemann, Heidi Swanson, and Alice Toll (Biology): **Effects of Light and of White-Tailed Deer Browsing on Seedling Growth and Survival for Four Tree Species Planted in Western Minnesota** (Adviser: Pete Wyckoff), abstract pg. 35

#22 Britta Haseman, Amanda Peters, and Gammachis Bokku (Biology): **Best Management Practices for Native Perennial Plants Grown as an Alternative Bioenergy Feedstock** (Adviser: Margaret Kuchenreuther), abstract pg. 34

#23 Nathan Haverkamp and Aaron Goemann (Biology): **Secretive Marsh Bird Population and Habitat Assessment at Big Stone National Wildlife Refuge, Odessa, Minnesota 2013** (Adviser: Margaret Kuchenreuther), abstract pg. 34

#24 Rose Peterson (Theatre): **Twelfth Night Costume Design** (Adviser: Siobhan Bremer), abstract pg. 39

#25 Peter Rerick (Psychology): **Perceptions of Love** (Adviser: Nick Benesh), abstract pg. 40

#26 Sonia Ellison (Geology): **Ice Volume Change in Sydöstra Kaskasatjåkkaglaciären, Swedish Arctic, 1980-2013**, abstract pg. 34

#27 Ashleigh Thompson (Anthropology): **Anthropogenic Transformation at Angel Mounds: Topographic Change of Mound A** (Adviser: Rebecca Dean), abstract pg. 42

Presenter: Mitch Patzer
Project Adviser: Michael Korth (Physics)
Title: Virial Coefficients of a Hard Sphere Fluid
Type of Presentation: Poster or Visual Display #6

The hard sphere fluid model forms a theoretical basis for understanding the structure of fluids. In such a model, each molecule of the fluid is represented by a sphere and the only interactions that occur are the elastic, or billiard ball-like, collisions between the spheres. This simple model does a remarkably good job at modeling fluids. Furthermore, a successful hard sphere model paves the way for more complex fluids. A fluid comprised of weakly interacting particles is described by the ideal gas law. The ideal gas law is used to approximate how fluids act under various conditions. However, the ideal gas law has several limitations. Using a hard sphere model, we were able to find corrections to the ideal gas law. These corrections, or virial coefficients, add accuracy to the ideal gas law. We have calculated the virial coefficients for a hard sphere model using an approach developed by Shinomoto. We found reliable values for the first four virial coefficients. The first two agreed very precisely with the now accepted values while the third and fourth differ somewhat from their accepted values. We have shown that this simple model allows us to obtain accurate corrections to the ideal gas law. These corrections justify our simple model and open the way for more realistic models of fluids.

Presenter: Rose Peterson
Project Adviser: Siobhan Bremer (Theatre)
Title: "Twelfth Night" Costume Design
Type of Presentation: Poster or Visual Display #24

The research I did when designing the costumes for the University of Minnesota - Morris fall production of "Twelfth Night" came from Elizabethan style clothing and oceanic creatures. My goal was to find a balance between the two styles that I researched. William Shakespeare wrote "Twelfth Night" with the intent for it to take place in England in the 1600's, but the director for this production took a new approach, adapting it to fit her concept in a dream-like, underwater, and beach setting. Viola, the main character, is washed up on an island after a shipwreck; so, my design challenge was to find ways to balance the clothing look of the Elizabethan style as well as characteristics of sea creatures and other tropical elements. My design for the character Malvolio is a good example of finding this balance. The costume's basic silhouette takes on the form of a traditional Elizabethan tunic, whereas the finer details incorporate elements of the sea. My character analysis of Malvolio led me to use features of a shark in his costume, due to his antagonistic, stiff, and somewhat aggressive traits. For each design, I drew inspiration from the content of the script as well as my research on sea creature characteristics and visual appearance. The concept chosen and the artistic approach that I took on the costume designs made for a unique visual element in this production, which reflects the different types of research that I have done.

Presenters: Hong Liu, Margaret Miller, and Yejin Cho
Project Advisers: Stephen Burks (Economics and Management), Jon Anderson (Statistics), Rebecca Erickson (Center for Small Towns)
Title: Difference in Accident Costs Among Drivers with OSA
Type of Presentation: Poster or Visual Display #17

As part of a larger project analyzing data from a firm which mandates obstructive sleep apnea (OSA) screening, diagnosis, and treatment for its commercial drivers, this study examines a specific problem in the analysis of the effects of OSA: are there differences in the distribution of accident costs associated with different OSA-related statuses among these drivers? We use a case-control approach, matching diagnosed drivers with undiagnosed controls who have the same experience at hire and same tenure in the calendar week as the case had at diagnosis. Diagnosed drivers were split into groups by treatment compliance level: never compliant, partially compliant, and fully compliant. For each group, we calculated accident liability costs for all preventable accidents, high potential severity preventable accidents, and DOT-reportable preventable accidents. Wilcoxon rank sum tests were used to compare accident cost distributions since a small number of expensive accidents make average values hard to directly compare significant difference. We find that the drivers who were non-compliant with OSA treatment had significantly higher accident costs than any other driver group studied, including the controls. Fully compliant, partially compliant, and control drivers had statistically indistinguishable accident cost distributions, so these breakout groups were averaged. By using results from another part of the study estimating accident risks among the studied drivers, we project cumulative accident liability cost per year for each group. Because non-compliant drivers had the highest risk among the groups as well as higher costs per accident, their cumulative accident costs are much higher than other groups.

Presenters: Magen Nivison and Maryanna Kroska
Project Adviser: Zack Mensinger (Chemistry)
Title: Synthesis of Metal-Organic Frameworks for Peptide Adsorption Studies
Type of Presentation: Poster or Visual Display #11

Metal-organic frameworks (MOFs) are an intriguing class of hybrid materials that consist of infinite crystalline lattices formed by metal ions bridged by organic linkers. Their porous interiors have highly variable properties, depending on the metal ions and linkers used. To date, MOFs have primarily been examined for uses such as gas separation and storage and catalysis, but recently researchers have described the adsorption of proteins and peptides, such as cytochrome C and a trypsin digest of bovine serum albumin, in MOF pores. The MOF pore provides a stable, ordered environment in which to probe and characterize structural details of these natively unstructured peptides. In our research thus far, we have synthesized a series of MOFs including MIL-53 and MIL-101. These will be tested for peptide absorption using fragments of amyloid-β, one of the peptides that aggregates during the progression of Alzheimer's disease. After testing the fragments, the biologically present full-length Aβ(40) and Aβ(42) forms will be tested. We hope to learn structural information to enhance our understanding of neurodegenerative processes, such as peptide aggregation, thereby allowing us to target these peptide aggregation processes in treatment strategies for diseases like Alzheimer's.

2014 Undergraduate Research Symposium

FEATURE PRESENTATION
Humanities Fine Arts Building, HFA Recital Hall, #160
1:30 p.m.

Presenter: Reid Ronnander
Project Adviser: Peh Ng (Mathematics)
Title: Markov Chain Algorithmic Composition with Musical Form
Type of Presentation: Oral and Performance

Random noise has an appeal; for example, a wind chime creates noise based upon the random direction of the wind. This attraction to random noise can be harnessed formally in music composition. Wolfgang Amadeus Mozart, for example, composed music based on the role of a die. With this attraction to randomness, an algorithm to compose music can be created with randomness as an ingredient. Conversely, and contrary to the appeal of randomness, there is an inborn desire for repetition in music. This desire for repetition is captured in the compositional process is called form. In this presentation, I draw on both randomness and repetition to algorithmically compose music with the use of the mathematical system known as a Markov chain. Thinking of music as a person's movement between rooms, a Markov chain system accounts for randomness by randomly deciding which room the person is to go into. Alternatively, a Markov chain system accounts for repetition by allowing the person to stay in the room he or she is already in. The algorithm constructed in this paper has the person not move between rooms but instead through concepts of sound and music to generate a musical composition. In addition to presenting the construction of the algorithm, I present pieces composed through the implementation of the methodology and provide discussion on how the compositions draw on both randomness and repetition. Further implications of how this compositional algorithm could be applied to musicology, genre studies, or composer identification are included in the conclusion.

ORAL PRESENTATIONS
Science Building Room #s: 1020, 1030, 2200
John Q. Imholte Hall Room #s: 111, 112, 113 and 114

Presenter: Julie Arhelger
Project Adviser: Tisha Turk (English)
Title: Stop Teaching Grammar: A Grammar Nerd's Proposal for Fostering Literacy in the Writing Classroom
Type of Presentation: Oral Presentation
Science Building , Room #1020, 11:20 a.m.

Traditionally, grammar instruction is one of the primary ways teachers have attempted to help their students understand and use written English. However, composition studies scholars such as the influential Patrick Hartwell have found that formal grammar instruction does not help students become better writers and can even harm their abilities. In this presentation, I extend Hartwell's work by proposing alternatives to traditional grammar instruction; I argue that, instead of teaching and enforcing grammar rules, teachers should encourage all students' natural abilities with the written word by asking them to read often and widely and to critically analyze what they read and write. When students are asked to decipher the effectiveness of real sentences that they have read or written themselves, they will gain a wide-reaching literacy and the ability to critically analyze society: two key skills in the world students enter as they grow up. This presentation is both a defense of such a radical approach to grammar and literacy and an overview of some methods and assignments teachers have begun to use that focus on literacy rather than grammar instruction. Methods include encouraging excitement for reading in the earliest years of students' education, eliciting many formats of student response to readings, and asking students to examine texts as well as their own works for composition techniques to teach them the power of their own written words in the transaction between reader and writer.

Presenter: Rachel Balzar
Project Adviser: Michael Lackey (English)
Title: "Bridging [the] generational gaps ": An Examination of M. Carl Holman's Role in the Haverford Discussions
Type of Presentation: Oral Presentation
John Q. Imholte Hall, Room #111, 4:10 p.m.

In 1969, ten prominent African American intellectuals gathered to discuss a serious issue: the effect of the separatist movement on African American college students and the burgeoning field of Black Studies. These intellectuals, known as the Haverford Group, intended to combat the inherent racism in Black Power rhetoric and establish Black Studies as a rigorous academic field. Unfortunately, their voices were never heard. The Haverford Group's discussions were not published, and its plans were never followed through on. It is only now, with the publication of Michael Lackey's book, The Haverford Discussions: A Black Integrationist Manifesto for Racial Justice, that the thoughts of such major scholars on separatism are being made available to the public. But one must ask the question: why has it taken so long for these discussions to be published? In my essay, I answer this question through a close analysis of the contributions to the discussions provided by one of its youngest participants: M. Carl Holman, a writer and activist, who has fallen into relative obscurity. Recurring themes in Holman's contributions to the discussions, as well as in his poetry oeuvre, show him to empathize with his students on a level that his older colleagues simply do not—and this lack of empathy, I propose, is precisely the problem. It is fortunate that the Haverford Discussions have been published at all. They might have been published much earlier, however, if the group had made more of an effort to connect with the younger generation.

Presenters: Zach Klassen and Josef Wieber
Project Adviser: Sylke Boyd (Physics)
Title: Climate Variability and Local Land Use in the Upper Midwest
Type of Presentation: Poster or Visual Display #1

We have analyzed the longitudinal weather records from twelve distinct weather stations in Minnesota and the Dakotas in conjunction with long-term changes in land use in those locations including diurnal temperature range, precipitation, daily maximum, minimum, and mean temperatures, and other data. The land types include rural cultivated land, urban areas, and forest. One motivation for this study was to investigate the role of the transition from prairie land to high-evapo-transpiration crops such as soy and corn. The weather records were obtained from the National Climatic Data Center of the National Oceanic and Atmospheric Administration. We observe an increase in the extreme minimum temperatures throughout all months of the year. The increase in minimum temperatures is most pronounced for the northern-most locations in the dataset and for the winter months. Consistent with similar observations from other US locations, the mean daily temperature range has a decreasing trend for all non-urban locations. Urban locations are showing clear heat-island effects of increases in all temperature markers but no significant variations in daily temperature range. No significant difference in trends is found between cultivated and forested locations.

Presenters: Connor Lewis and Amanda Wiener
Project Advisers: Stephen Burks (Economics and Management), Jon Anderson (Statistics), Rebecca Erickson (Center for Small Towns)
Title: Moving Ahead by Thinking Backwards: Cognitive Skills, Personality, and Economic Preferences in Collegiate Success
Type of Presentation: Poster or Visual Display #18

Although some research exists regarding collegiate GPAs, little is known about which individual student characteristics predict college graduation. We study 100 students from the University of Minnesota - Morris. Information collected includes demographics, standard personality traits (known in psychology as the"Big Five"), two economic preferences (risk aversion and patience), and three cognitive skills (numeracy, non-verbal IQ, "Hit15")."Hit 15" is a game played against the computer in which each player must add 1, 2, or 3 on each turn. Winning is exactly hitting fifteen first; players take turns going first and the starting point total varies (economists call solving this "backward induction"). Using standardized versions of our variables in multivariate models, we analyze their power to predict three student success measures—timely graduation (≤ 4 years), graduation at all (≤ 6 years), and GPA. Controlling for other measured characteristics the "Hit 15" measure weakly predicts 4-year graduation and strongly predicts 6-year graduation. Interestingly, "Hit 15" is more powerful than other cognitive skills in a combined multivariate model. We compare these findings to results from parallel models run on a cohort of 1,065 trainee truckers, from whom identical initial measures were collected. Similar to the student cohort, "Hit 15" is strongly associated with trucking success over time—defined as completing a one-year training contract. This suggests "Hit 15" deserves further investigation as it captures something above our other measures in both settings: the ability to think backwards from future goals to determine the best current action to take under varying circumstances.

Presenters: Brandon Karels and Travis Beck
Project Adviser: Ted Pappenfus (Chemistry)
Title: Exploratory GC/MS Chemical Analysis
Type of Presentation: Poster or Visual Display #12

Instrumentation is a critical part in the investigation and identification of compounds. One novel instrument in particular, the Gas Chromatograph/Mass Spectrometer (GC/MS), identifies different types of compounds present in the sample through separation and subsequent identification based on specific chemical properties. The Chemistry Discipline recently purchased a new GC/MS for analytical characterization. This new instrument should allow for a larger range of chemicals to be analyzed due to the instrument's design and increased sensitivity of the instrument's configuration. These enhanced parameters will allow for investigating more volatile samples. Furthermore, this GC/MS includes a direct insertion probe which further permits the analysis of low volatile organic species by directly inserting them into the GC/MS ionization chamber. The purpose of this research is to determine appropriate methods and techniques for the analysis of organic materials using this new instrument. Such methods focus on the analysis of known materials and applying them to new materials. Specifically, these new materials of interest include benzodithiophenes - an important class of organic materials used in a variety of electronic devices. A presentation will include preliminary results of our method developments.

Presenter: Saesun Kim
Project Adviser: Micheal Korth (Physics)
Title: Virial Coefficients for the Liquid Argon
Type of Presentation: Poster or Visual Display #5

The spatial structure of a fluid is often described by the two-particle correlation function g_2 (r_12). This function is the probability of a second particle being located a distance r from the first particle. We calculated the spatial structure of a fluid in a geometric model of hard colliding spheres based on the approach of Shinomoto. This model is very important because for decades it has served as the foundation for understanding simple and complex fluids. In this model, we calculated the net force on a particle due to random collisions and show that this leads to an effective interaction between particles that results in the spatial structure g_2 (r_2).Then, we added a known interaction for argon based on the work of Aziz. We generated g_2 (r_12) for argon at various values of density and obtained correction to the ideal gas law for liquid argon which are known as visual coefficients. The low order coefficients are in good agreement with theoretical hard sphere coefficients.

Presenter: Wesley Brand
Project Adviser: Pieranna Garavaso (Philosophy)
Title: Time Out! Impassable Barriers to Time Without Change
Type of Presentation: Oral Presentation
Science Building, Room #1030, 11:20 a.m.

Statements that claim time can pass without anything changing do not appear readily sensible to the occupants of this universe. Mathematical formulations of our physical laws assert that a change in time is equivalent to changes in other properties. The philosopher Sydney Shoemaker, however, suggests that the relationship between time and change is not a necessary one. He constructs a hypothetical world where places stop changing for year-long spells to show that the concepts of time and change are logically distinct. Shoemaker argues with this thought experiment that it is possible that people could have well-justified beliefs that changeless intervals of time exist based on evidence from temporarily changeless regions; however, I argue that the thought experiment cannot be completed because the possible existence of changeless space implies the truth of a logical contradiction. If an object were approaching a changeless region it would necessarily either enter or not. If the object enters the region, then the region undergoes a change. If it does not enter, then the region caused a change in its trajectory, hence its causal properties changed. Either way, a supposedly changeless region underwent a change, so the thought experiment is impossible. My counterargument disconfirms the possibility that time and change are logically distinct which preserves the common intuition that no time passes if nothing changes. The truth of this intuition would make time inextricable from physics and relieve the difficulties of Shoemaker's abstract notion of time.

Presenter: Danielle Brown
Project Adviser: Michael Lackey (English)
Title: Genocide: Conditions Behind Mass Murder
Type of Presentation: Oral Presentation
Science Building, Room #1020, 11:40 a.m.

My project will fit into the Holocaust and genocide studies of the 21st century, particularly drawing off of the UMM course "Holocaust Literature and Film" taught by Dr. Michael Lackey. My work will attempt to clarify the motivations behind various genocides, including the Khmer Rouge (Cambodia) and the Holocaust (Germany/Europe). In this project, I will explore this motif cross-culturally, using the Intentionalist (ideological beliefs that spread from the elites down to the general populace) and Functionalist (grassroots circumstances that create and spread ideological beliefs from the lower-classes up) schools of thought to analyze and compare conditions that make these atrocities possible. My main evidence thus far for my research and analysis is both material from the course "Holocaust Literature and Film" as well as the documentary "Enemies of the People".

Presenter: Kelsey Butler
Project Adviser: Tisha Turk (English)
Title: Discourse and the Working-Class Student: Student Voice, Teacher Authority, and Community Engagement
Type of Presentation: Oral Presentation
John Q. Imoholte Hall, Room #113, 4:10 p.m.

The conversation regarding the level of engagement of students from blue-collar backgrounds in the composition classroom is a relatively new one. Beginning in the early 1990's and continuing into the 2000's, the discussion – taken up by the likes of prominent composition scholars such as Patricia Bizzell, Peter Elbow, Lynn Bloom, and Lisa Delpit – insisted that progressive, critical education would bring more equality. However, these arguments place the onus for success entirely on the principle of critical pedagogy, i.e. solely on the ability of the educator. David Seitz points out that this principle is "antipathetic to the sources of moral and spiritual power in many working class communities." Furthermore, these arguments fail to recognize that education often addresses inequality in theory, while perpetuating it in practice. Building upon the works of the aforementioned scholars, I argue that, in addition to developing critical literacy, students must also develop the ability to negotiate between multiple discourses. In other words, they must be able to critique, to preserve, and to reevaluate discourse. However, students' ability to successfully manage these negotiations rests on three basic developments: students cultivating their individual voice, educators evaluating their own authority, and finally embedding these practices in an engaged community of learners. This framework is highly relevant considering the large number of working-class students soon to be entering four-year universities across the country. It is only through the meaningful interaction of these three components that critical literacy can live up to its legacy as a liberatory and equitable practice .

Presenter: Donavon Cawley
Project Adviser: Pieranna Garavaso (Philosophy)
Title: Transporter Accidents and Personal Identity: The Case of Too Many Rikers!
Type of Presentation: Oral Presentation
John Q. Imholte Hall, Room #114, 3:30 p.m.

In analytic philosophy, there is a broad debate on personal identity, the necessary and sufficient criteria by which a person can be said to persist over time as one and the same person. One of the most influential views on personal identity is outlined in Derek Parfit's Reasons and Persons (1984). Parfit defends the view that personal identity requires only "relation-R" and "uniqueness." Relation-R is the chain of connected psychological states over time, as one would experience something today and tomorrow remember doing it yesterday. Uniqueness is when there is only one numerically identical subject of that psychological continuity. In this paper, I discuss these criteria using a thought experiment found in *Star Trek: The Next Generation*, where Commander Riker is split into two people in a transporter accident. While the show presents both duplicates as the "real" Riker, Parfit would say Riker no longer exists after his accident, as he no longer satisfies the uniqueness criterion. This is because, when Riker considers his future self, he sees two non-unique R-related persons. However, if we were to consider the perspective of the transporter duplicates looking back to their past selves, each would see one unique, R-related person: the original Riker. This appears consistent with Parfit's view, though inconsistent with the law of identity, as two distinct persons cannot be identical to a third. I argue this is because while personal identity is not incompatible with numerical identity, what really matters is qualitative identity between persons over time.

2014 Undergraduate Research Symposium

Presenters: Nathan Haverkamp and Aaron Goemann
Project Adviser: Margaret Kuchenreuther (Biology)
Title: Secretive Marsh Bird Population and Habitat Assessment at Big Stone National Wildlife Refuge, Odessa, Minnesota 2013
Type of Presentation: Poster or Visual Display #23

Wetlands in the Midwest have been in steady decline since the 1950s and the marsh birds that depend on them have been severely impacted. In order to properly manage remaining wetlands for continued use by marsh birds, the population status and habitat preferences of these birds must be known. Through the use of call-response surveys, we estimated the population of six secretive marsh birds at the Big Stone National Wildlife Refuge (BSNWR) near Odessa, MN. Over the entire survey period, we detected 47 Sora Rails (Porzana Carolina), 20 Virginia Rails (Rallus limicola), 12 American Bitterns (Botaurus lentiginosus), and 38 Pied-billed Grebes (Podilymbus podiceps). Using the geographic information system, ArcMap, we also estimated which habitat types these birds prefer and compared this information to published reports of habitat use for the same species outside of the BSNWR. Using vegetation surveys provided by the BSNWR, we characterized habitats within a 50m radius of each survey point. Sora, Virginia Rail, and American Bittern were heard in locations covered predominantly in both Typha (cattail, >90% cover) and Phalaris (reed canary grass, >90% cover). Pied-Billed Grebe were detected in areas of open water and Typha (cattail, >90% cover). Only a single Least Bittern was detected and no King Rail (Rallus elegans) presence was detected. We estimated population densities of 0.19 Sora/ha, 0.16 Virginia Rail/ha, 0.086 American Bittern/ha and 0.18 Pied-billed grebe/ha. Our findings are consistent with other research on secretive marsh bird population densities and habitat use in the Midwest.

Presenters: Alayna Johnson, Aaron Goemann, Heidi Swanson, and Alice Toll
Project Adviser: Pete Wyckoff (Biology)
Title: Effects of White-Tailed Deer Browsing and Canopy Openness on Seedling Growth and Survival in Western Minnesota
Type of Presentation: Poster or Visual Display #21

As part of larger study examining forest dynamics across a climate gradient at the prairie-forest ecotone, we conducted a 2013 survey on the growth and survival of four seedling species across six sites in western Minnesota. To measure the impact of white-tailed deer browsing, we conducted fecal pellet surveys to estimate deer densities at each site and surveyed growth and survival in control plots open to browsing and adjacent exclosures closed to browsing. Control and exclosure plots were constructed at sites with varied degrees of canopy openness in 2011, and sugar maple (Acer saccharum), basswood (Tilia americana), bur oak (Quercus macrocarpa), and European buckthorn (Rhamnus cathartica) seedlings were transplanted into each plot in 2012. By the end of two growing seasons, all four species exhibited increased mortality in response to deer browsing. However, invasive European buckthorn only showed significant mortality at sites with high deer density. Our results also show that basswood had the highest mortality at low-light sites, while buckthorn had the highest mortality at high-light sites. These results are surprising, as basswood is considered a shade specialist that is not expected to be sensitive to low-light conditions. Our results suggest that basswood seedlings may become less shade-tolerant at the drier, western extent of their range within Minnesota. Additionally, our results suggest that deer browsing plays a negative role in the survival of native seedling species and may be facilitating the success of invasive European buckthorn at western Minnesota sites with lower deer densities.

Presenter: Sonia Ellison
Title: Ice Volume Change in Sydöstra Kaskasatjåkkaglaciären, Swedish Arctic, 1980-2013
Type of Presentation: Poster or Visual Display #26

The change in the ice volume of the glaciers in the Tarfala Valley in the Swedish Arctic is an important subject because these glaciers represent a quantifiable and more easily observable indication of climate change. The terminus and surface elevations on Sydöstra Kaskasatjåkkaglaciären in the Tarfala Valley were last observed in 1980 via an aerial photograph, and a digital elevation model (DEM) was created based on this photograph. In order to create a more recent DEM and thereby determine the change in ice volume, we set out in the summer of 2013 to re-measure the terminus and surface using differential GPS, a measurement accurate to ~10cm. With this data, we are creating the first detailed DEM ever for this glacier. This is important for measuring volume loss/gain since 1980 and also as a base for future measurements and studies. Implications of the shape and volume change show how a small glacier (approx.1 km sq.) has responded to recent climate events. These results can be compared to response time data from larger glaciers in the same valley. Preliminary results indicate that since 1980, the glacier has lost volume and retreated in its terminus. Together, these results can lead to a better understanding of glacial response and what to expect as climate change continues.

Presenters: Britta Haseman, Amanda Peters, and Gammachis Bokku
Project Adviser: Margaret Kuchenreuther (Biology)
Title: Best Management Practices for Native Perennial Plants Grown as an Alternative Bioenergy Feedstock
Type of Presentation: Poster or Visual Display #22

Native perennial plants have the potential to be used as an alternative bioenergy feedstock, but the best management practices for these lands remains undeveloped. Our objective was to determine which type of fertilizer and harvest treatment promoted the greatest biomass production, while maintaining plant diversity and resistance to weed invasion. Experimental plots were planted in 2008 on a farm in Starbuck, MN with a mix of ten native grasses and forbs. Thirty-two plots, managed in a split-plot design with four nitrogen fertilizer treatments (none, manure, half recommended, and full recommended) and two harvest treatments (harvest or no-harvest), were sampled each summer beginning in 2010. Here, we report results from summer 2013. In past years the harvest treatment resulted in greater biomass production than the no-harvest treatment across all fertilizer levels. However, in 2013 the half- and full-fertilizer harvested plots produced more biomass than no-harvest plots. In these harvested plots, we observed a much greater percent cover of invasive thistles than in past years, which likely explains the increase in biomass. As in past years, percent cover of grasses increased as nitrogen increased and was highest in harvested plots, whereas legume cover decreased as nitrogen increased. The frequency of legumes also decreased dramatically with increasing nitrogen addition with harvest lessening this negative effect somewhat. Our results suggest that low nitrogen inputs and harvest benefit the diversity and quality of restored prairie and produce the most profitable biomass crop.

2014 Undergraduate Research Symposium

Presenter: Yuyan Chen
Project Adviser: Oscar Baldelomar (Psychology)
Title: An Examination of Global Identity in College Students
Type of Presentation: Oral Presentation
John Q. Imholte Hall, Room #112, 2:30 p.m.

In today's increasingly globalized world, people become more open to different cultures, diverse ideas, and novel experiences. More people start to view themselves as a member of the global community and adopt a more inclusive, global identity. Past research that specifically examines relationships between global identity and various factors is limited, and this study helps fill this gap. In this study, psychological factors that are related to global identity were examined including: the openness to experience personality trait, ethnocentrism, national identity, and cultural orientations of individualism/collectivism. The possible associations between these factors were also investigated. It was hypothesized that the degree to which people identify with global identity is positively related to higher scores of openness to experience, international connectedness, and individualism, and lower scores of ethnocentrism. Of the 171 University of Minnesota – Morris undergraduate participants who responded to a survey, 58 were males and 110 were females. The preliminary analysis supports the hypothesis. Furthermore, this study provides examinations of global identity that are necessary in understanding human behaviors and development in a globalized context.

Presenter: Sam Daniewicz
Project Adviser: Oscar Baldelomar (Psychology)
Title: Attitudes Towards Drug and Alcohol Use: Culture and Emerging Adulthood
Type of Presentation: Oral Presentation
Science Building, Room # 2200, 11:00 a.m.

This study examined attitudes toward drug and substance use during emerging adulthood (18-26 years of age), a stage of the life span that works as a transition into adulthood and is defined by exploration and openness. Since drug and substance use among emerging adults is often a subject of current debates, it is important that more research is done about why young people think of certain drugs the way they do. Specifically, this study focused on how perceptions of drug and substance abuse are related to cultural values (individualism/collectivism) during emerging adulthood. To accomplish this goal, attitudes towards drugs in general, alcohol, marijuana, and tobacco were compared to levels of emerging adulthood and the cultural variables of individualism and collectivism. To quantify these attitudes and variables, 200 participants (18-26 years of age, 133 females, 65 males, and 1 trans*) responded to an online survey with questionnaires assessing attitudes towards drug use, beliefs about consequences of three different drugs, emerging adulthood development, individualism/collectivism, and demographic background. It is expected that: (1) students with higher levels of emerging adulthood exploration would be more likely see drugs more positively, and (2) that students who are more individualistic will also tend to see drug use in a more positive way, as individualism supports choice and self-exploration. Results are expected to be relevant for achieving a better understanding of the way people think about drugs. If evidence demonstrates factors in these attitudes, incorrect or harmful attitudes can be targeted through these areas.

Presenter: Megan Fitzgerald
Project Adviser: Julia Dabbs (Art History)
Title: Rembrandt: The Practice of a Printmaker
Type of Presentation: Oral Presentation
John Q. Imholte Hall, Room #112, 3:50 p.m.

Throughout history printmakers have learned from the masters of the past in order to further their own knowledge of their medium, propelling it into the future. Baroque master Rembrandt van Rijn once said, "Try to put well in practice what you already know; and in so doing, you will in good time, discover the hidden things which you now inquire about." What can a twenty-first century printmaker learn from the practice of a master such as Rembrandt? My research expands upon the basic technical knowledge of the artistic process of etching which involves biting lines into a metal plate with an acid solution that illustrates the artist's desired design where it can be inked and printed over and over on paper. In order to shed light on what it took to hone his skills with the etching medium, I have personally analyzed Rembrandt's etchings that are currently being held at the Minneapolis Institute of Arts which clearly showcase his relentless experimentation throughout his thirty year career and, in the end, results in an oeuvre fit for a masterful printmaker of any time period.

Presenter: Maria Fleck
Project Adviser: Oscar Baldelomar (Psychology)
Title: Cultural and Social Setting Effects on Attitudes Toward Criminal/Deviant Behaviors
Type of Presentation: Oral Presentation
John Q. Imholte Hall, Room #113, 2:50 p.m.

This study examined attitudes toward a variety of criminal and deviant behaviors such as theft, academic dishonesty, and rioting during emerging adulthood (18-26 years of age), a stage of the life span that works as a transition into adulthood. This is an important area of research because attitudes toward different deviant and criminal behaviors have an effect on subsequent behavior. Moreover, research comparing these kinds of attitudes with cultural variables and the life stage of emerging adulthood has not been conducted in the field thus far. My research question is: how and to what extent does social setting and cultural identity affect emerging adults' attitudes towards different criminal and deviant behaviors? Thus, in this study, emerging adult's attitudes towards these behaviors were compared to cultural variables such as individualism and collectivism. To measure these variables, 200 UMM students participants (ages 18-16) responded to an online survey that presented vignettes depicting different deviant and criminal behaviors in differing social settings. Participants were then asked to rate their moral agreement with the behavior and explain the reasoning behind their response. Vignettes were categorized into five different social settings: personal, familial/friends, employment, academic, and governmental. Questionnaires about emerging adulthood development, individualism/collectivism, and demographic background were also included. I hypothesize that attitudes towards the moral agreement of these criminal and deviant behaviors will vary depending on the strength of the participant's identification toward an individualist or collectivist identity. In vignettes involving crimes done on behalf of furthering of self-interest, I hypothesize that those who identify as more individualistic will rate these types of behaviors as more morally acceptable.

2014 Undergraduate Research Symposium

Presenter: Allison Christiansen
Project Adviser: Jennifer Goodnough (Chemistry)
Title: The Effects of Sodium Chloride on Hydrogen Bonds in Water Observed Through Sodium-23 and Proton NMR
Type of Presentation: Poster or Visual Display #9

The hydrogen bonding between water molecules contributes to many of its unique properties such as surface tension, cohesion, and capillary action. However, adding different solutes can have an effect on the strength of these bonds. This effect has been previously studied using proton Nuclear Magnetic Resonance (NMR), but has yet to be studied using sodium-23 NMR. This is a novel approach because sodium is neither a hydrogen bond donor nor acceptor donor, whereas hydrogen is. Samples of different concentrations of sodium were made in water. These samples were then observed using sodium-23 NMR and then compared to proton NMR. There was a clear, observable trend in both the sodium and proton NMR chemical shift data that would suggest that sodium-23 NMR can be used to observe hydrogen bonding in water. However, at low concentrations this correlation became difficult to quantify. Future work to gather more data at the lower concentrations as well as theoretical calculations is necessary to make a successful conclusion on sodium's effect on hydrogen bonding in water. This proof of the concept that atoms not directly participating in a hydrogen bond can be a probe for studying hydrogen bonding opens up new ways to examine h-bond structure and dynamics.

Presenters: David Donatucci and Kirbie Dramdahl
Project Adviser: Nic McPhee (Computer Science)
Title: Analysis of Ancestry in Genetic Programming with a Graph Database
Type of Presentation: Poster or Visual Display #16

Genetic programming is an artificial intelligence system that uses basic properties of biology such as fitness, mutation, and crossover to manipulate a population of functions represented as trees. In performing mutations and crossovers over many generations, genetic programming attempts to evolve these trees toward a desirable result. This process is achieved in a similar manner to natural selection, where trees with stronger fitness have a better chance of reproduction. In this project, our objective is to map the ancestry of these trees and how they change over time using a graph database. A graph database is a database that uses graph structures with nodes, edges, and properties to represent and store data. Since graph databases are relatively new, we can use included features to obtain data that would be difficult with standard databases. Our hope is that by recording and analyzing this data, we will learn key factors regarding where trees show significant improvement in fitness and how those improvements are obtained. This will allow for a better understanding of how genetic programming works, and provide details for future improvements in the field.

Presenter: Travis Beck
Project Adviser: Jennifer Goodnough (Chemistry)
Title: The Relationship of Hydrogen Bonding with Changing Concentrations of Methanol-d3 and Water
Type of Presentation: Poster or Visual Display #10

Hydrogen bonding frequently occurs between a hydrogen atom and a highly electronegative atom that are in close proximity, especially in biological sciences since hydrogen bonding is an integral part of DNA and protein stability. When two hydrogen bonding molecules are mixed into a solution, the bonds are continually forming and breaking between two of the same types of molecules and/or two different types of molecules. However, little research has been invested if hydrogen bonding occurs more readily between two methanol-d3 (CD3OH) molecules or between a CD3OH and water molecule. Replacing the methyl protons (H) with deuterium (D) allows us to isolate the protons which participate in hydrogen bonding. In this research, multiple trials were performed with varying concentrations of CD3OH and H2O. The concentration of CD3OH varied from 0.5mol% to 75.0mol% while the concentration of H2O varied from 99.5mol% to 25mol%. The solutions were analyzed using Nuclear Magnetic Resonance (NMR) to determine if hydrogen bonding was occurring between two CD3OH molecules, a CD3OH and H2O molecule, or two H2O molecules. When there was an increase in the concentration of CD3OH, the distance between the peaks varied, suggesting that when CD3OH was increased, there was a change in the hydrogen bonding, but there was no quantifiable relationship. When the concentration of CD3OH was above 50 mol%, there were two peaks present on the NMR spectra between four and five ppm. This suggests that there are now two very different electronic environments around the individual –OH group in methanol and water.

Presenter: Wesley Brand
Project Adviser: Gordon McIntosh (Physics)
Title: Comparing Velocity and Oscillatory Parameters of Astrophysical Masers for SiO v=1, J=1-0 and J=2-1 in Long Period Variables
Type of Presentation: Poster or Visual Display #3

Some variable stars in the asymptotic red giant branch are known to emit microwave lasers (masers) due to the molecular transitions of silicon monoxide (SiO) molecules. Current theory claims masers are associated with mass loss in long period variable stars (LPVs), a process that results in the ejection of the heavy elements necessary for planetary formation. Analysis of SiO maser spectra will yield clues about both the energetic pumping and mass loss processes that generate them. These spectra contain information about the range and weighted average (centroid) of velocities of masing SiO clouds moving in the vicinity of the astronomical object. This research evaluates velocity parameters calculated from the spectra of simultaneously observed v=1, J=1-0 and the v=1, J=2-1 SiO molecular transitions from published observations of about 40 stars in the Mopra SiO Maser Catalog. The velocity parameters are analyzed by rate of occurrence and are also compared to the oscillation periods of source stars. So far, the results are consistent with previous research on a different set of stars: the J=2-1 velocity range is almost always less than the J=1-0 range. Additionally, the ranges and oscillation periods appear to be correlated with each other. These results will be important to inform and constrain models of the SiO masing phenomena, specifically any proposed maser pumping mechanism must favor the more robust J=1-0 transition. Some LPVs in the data set have anomalous relationships between parameters which indicates those stars are more complex physical systems, possibly hosting planets or forming binary systems.

2014 Undergraduate Research Symposium

Presenter: Tessa Hagen
Project Adviser: Pieranna Garavaso (Philosophy)
Title: The Particularities of Personhood: A Response to Elizabeth V. Spelman's "On Treating Persons as Persons"
Type of Presentation: Oral Presentation
Science Building, Room #1030, 11:40 a.m.

This presentation explores the concept of personhood outlined by Elizabeth V. Spelman's article "On Treating Persons as Persons". Spelman, a feminist philosopher most famous for criticizing second wave feminisms, identifies two approaches to treating persons as persons. The first approach treats persons as bearers of universal rights, the second takes into account how persons see themselves to be. The focus of this presentation concerns the second, much newer approach, which is Spelman's original contribution to this debate. Spelman argues that recognizing people as the persons they see themselves to be relies on every individual's unique perception of self, as one's image of oneself is not as accessible to others. However, Spelman's proposal of treating someone as a person assumes that a person has a clear self-image of themselves. In addition, she places value on conversation while disregarding the importance of behavioral indicators. I object to this assumption, as one's self-image is not always a reliable source source of knowledge about an individual; there is room for both voluntary and involuntary mistakes in communicating this image of oneself to others. For example, some people lie, some may wish to be treated in a way other than how they see themselves, and others may struggle with portraying themselves clearly to others, especially through words. If this is the case, then in certain circumstances it is much more difficult to recognize people as the persons they believe themselves to be, let alone treat them as persons based on these faulty portrayals.

Presenter: Sarah Hanson
Project Adviser: Ray Schultz (Theatre)
Title: Stage Management: A Case Study of "Uncommon Women"
Type of Presentation: Oral Presentation
Humanities Fine Arts Building, Black Box Theatre, 3:00 p.m.

Stage managing a theatrical production requires considerable organizational skill and time management capabilities. Historically, the stage manager was not always involved in the theatrical process, and only relatively recently has the stage manager become an essential part of the production team. This presentation will focus on my process of stage managing the University of Minnesota - Morris Theatre Discipline's production of "Uncommon Women and Others". Much of a stage manager's job is facilitating communication between the director, the designers, the cast, and the crew. Without smooth communication, it can be difficult for a production to move forward, and my goal is to help it progress as efficiently as possible. Throughout this process, I will be assisting the director in administrative duties such as scheduling meetings and rehearsals, checking in with the costume and scene shops, as well as sending out emails to the cast and crew with updates on a daily basis. During rehearsals the stage manager's job is to keep everyone on task and on time, as well as maintaining a prompt book. Later in the process, when technical rehearsals begin, the stage manager adds any relevant technical cues to the prompt book. When performances begin, the stage manager is responsible for making sure all the cast and crew show up and do their part, as the director's job is essentially over at that point. I will also be calling all the cues for the show so they execute artistically and at the proper time. Hopefully, all this will ensure a successful performance.

Presenters: Natalie Hoidal and Jordan Wente
Project Adviser: Gary Wahl (Studio Art)
Title: Estar in el Prairie
Type of Presentation: Oral Presentation
John Q. Imholte Hall, Room #111, 2:30 p.m.

Rural Minnesota's demographics are radically changing; 2010 census data indicated 274% increase in the Latino population of Stevens County, MN. Given the linguistic and cultural differences between the established Anglo community and the newly emerging population of Latinos, communication and relationship building does not occur easily or often without facilitation. This project documents this new migration with two goals in mind: to put faces and stores to statistics and to build relationships in the Morris community through art. We have paired Morris students, faculty, and town members with recently arrived families and individuals including dairy workers, restaurant owners, pastors, etc. to showcase the diversity within the Latino community. Each pairing meets in a Stevens County location important to the subject, discusses the newcomer's story, and decides on a phrase that positively reflects their experiences in Morris. They write the phrase in Spanish, then in English on a whiteboard, and photograph the individual holding their phrase. For example: a Latino family wrote, "Raising our children in 2 cultures," and was photographed together at the University, where the father teaches. Thus, sharing stories via the art of photography manifests the raw, yet beautiful aspects of place, family, community, and culture, which conveys feelings and messages that transcend cultural and linguistic barriers. The process also builds understanding and friendship between the pairing with the ultimate goal of creating broader community relationships that will shape Morris as it evolves to include new people and cultures.

Presenter: Justin Irlbeck
Project Adviser: Barry McQuarrie (Mathematics)
Title: Estimating Parameters in a Continuous Dynamical System
Type of Presentation: Oral Presentation
Science Building, Room #1030, 11:00 a.m.

Dynamical systems are used to model occurrences such as population changes and human cell processes. Scientists need the ability to examine a data set and discern a system of differential equations that is capable of generating said data set. This research focuses on determining the parameters in that system of differential equations when given a form for the differential equations and a data set. Using a Lorenz system to generate a data set, I examined two techniques to recover the values of the parameters in the model. The first method, involving a simple modification of the differential equation model, was not very robust as the nonlinear system of equations to be solved grew complicated. A second technique using B-Splines is proving more useful. B-Splines define a smooth function as a piecewise set of polynomials (typically cubic). Any spline function of some given degree can be expressed as a linear combination of B-Splines. I developed a computer routine that can fit a B-Spline to a data set by utilizing a least squares technique. The more pieces or knots in a B-Spline normally lessens the error as these splines scale well with noisy data sets. This B-Spline will then be used to initialize a sequence of parameter values that converge to values that have the best fit of the dynamical system to the data set. This is a least squares minimization, which minimizes a function that includes the B-Spline representation of the solution in the dynamical system.

2014 Undergraduate Research Symposium

Presenter: Michael Raynes
Project Adviser: Ann Duhamel (Music)
Title: Drip, Drip, Drip: Blood and Bereavement in the Edward Ballade by Johannes Brahms
Type of Presentation: Performance
Humanities Fine Arts Building, Recital Hall #160, 11:20 a.m.

Johannes Brahms was a late Romantic composer who became most prominent in the latter half of the 19th century. Through his orchestral, vocal, and piano literature, he contributed much to the time period by firmly rooting himself to structures and forms of the Baroque and Classical era while still exploring neoteric concepts of harmony and rhythm. His first Ballade in D minor is a Klavierstücke, or a piece composed for solo piano, and it is based on a poem called 'Edward' by 18th-century philosopher Johann Gottfried Herder. The text, taken from a collection of folk songs entitled "Stimmen der Völker in ihren Liedern" ("Voices of the People in their Songs"), presents a dialogue between the title character, Edward, and his mother who incessantly asks questions about his bloodstained sword that he carries. This in turn leads to his confession of the murder of his father. Edward subsequently curses his mother for the counsels that she gave him. Through research on Herder and analysis of Brahms' music, I will examine the poetry as it contributes to the musical narrative of this piece. Additionally, I will pinpoint the specific musical and tonal imagery that gives this ballade its true character. I am using current scholarship by pianists and musicologists as a springboard from which to begin and then adding my own analysis to the discussion. Then, I will conclude the fifteen-minute presentation with performing the piece in its entirety.

POSTER PRESENTATIONS
Oyate Hall, Student Center

Presenter: Tiwaloluwa Ajibewa
Project Adviser: Joseph Alia (Chemistry)
Title: Correlation Among Field and Laboratory Tests of Balance in Healthy Adults
Type of Presentation: Poster or Visual Display #19

The Accusway static balance test and the Dynamic Posturography test are commonly used laboratory tests to accurately assess balance in human beings. However, these tests can be expensive, require specialized equipment, and require trained personnel. Hence field tests, such as the Balance Error Scoring System (BESS) and modified STAR Excursion tests, are more widely used as alternatives to assess balance. The objective of this study was to investigate how well the field and laboratory tests of balance correlated with one another by comparing consistency of results among two field tests (BESS test and Modified STAR Excursion test), and two laboratory tests (Accusway static balance test and the Dynamic Posturography test) in healthy adults. Our results showed that while there are a few correlations between static and dynamic balance tests, there is strong correlation within static and dynamic balance test results, regardless of whether the tests are performed in the field or in the laboratory. This result is significant because it will allow greater flexibility (financial and otherwise) in the administration of balance testing to healthy adults.

PERFORMANCE PRESENTATIONS
Humanities Fine Arts Building, HFA Recital Hall #160
Humanities Fine Arts Building, Morrison Gallery

Presenters: Sydney Long with John Malecha and Hannah Palmer
Project Adviser: Stephanie Ferrian (Dance)
Title: Data and Dance: Lose the Words; Get the Picture
Type of Presentation: Performance
Humanities Fine Arts Building, Recital Hall #160, 11:40 a.m.

Within the medical field, a patient's condition is documented through thousands of words entered as lengthy narratives or entered into small comment fields in electronic medical records. Lack of a standardized process can often lead clinicians to find creative ways to utilize data fields in ways other than the intended use. With all these words floating around in different formats, a great idea can quickly become muddled. So how do we bring attention to the problem and explore how to fix it? PowerPoints at large conferences have certainly had their day, but something more effective lies untapped—dance. Human form in motion can communicate and clarify far beyond the mere reach of words—the idea underpinning the "Dance Your Ph.D." initiative of Science Magazine and John Bohannon. Building upon Bohannon's inspiration, I have created a three-part dance to present problems of incorrect data input for an upcoming transplant conference at the University of Minnesota. This three-part dance will first depict two ways of incorrect data input and its consequences. The final segment illustrates the ideal: correct data entry creates reliable and retrievable statistics and information. It is my conclusion that when addressing this issue overflowing with confusing terms, the most effective way of informing large groups should be by using no words at all. My presentation concludes with a performance of my choreography for the transplant conference.

Presenter: Sienna Nesser
Project Adviser: Jess Larson (Studio Art)
Title: The Art of Decomposition: Examining Uncomfortable Materials through the Comfort of Fiber Arts
Type of Presentation: Performance
Humanities Fine Arts Building, Edward J. & Helen Jane Morrison Gallery, 11:00 a.m.

In studying the cycle of life, most humans prefer to focus on the parts in which we are living, and as living creatures, it makes sense that we are biased toward our own lives. I, however, am interested in the rest of the cycle. I believe there is overlooked beauty and ingenuity in the creatures that create decay. Additionally, it is only in considering the entire cycle that we may sustainably feed ourselves. It is thanks to mushrooms and maggots that food waste and human remains disintegrate into the environment to be reused. Through my textile work, I celebrate the lives of decomposers and detritivores, bringing light and color to topics of death, decomposition, and defecation. I use conventional handcraft techniques, such as embroidery, to address unconventional topics like nutrient cycling. Conversely, I use unusual materials such as my own hair to create the most common of traditional crafts: the crocheted doily. I also sew clothing out of found items including cast off zippers and garden hose. These material choices are informed by my academic interest and personal commitment to the sustainable, cyclical systems of small-scale agriculture and the resourcefulness with which it is often associated. In this artist talk, I will present my current body of work, which addresses the beauty of decomposed, dead, and defecated matters. I will discuss the concepts and construction processes of both the wearable and non-wearable pieces as I serve as my own model in a living presentation of the artwork.

2014 Undergraduate Research Symposium

Presenter: Lindy Jackson
Project Adviser: Ray Schultz (Theatre)
Title: The Research and Methods for Playing Kate Quin in UMM's Theatre Production "Uncommon Women and Others"
Type of Presentation: Oral Presentation
Humanities Fine Arts Building, Black Box Theatre, 3:15 p.m.

April 9-13 in the HFA Black Box Theatre, the University of Minnesota - Morris Theatre Discipline will be presenting "Uncommon Women and Others" by Wendy Wasserstein, and I will be performing in the role of Kate Quin. In order to get a full understanding of my role as Kate and the overall relevance of the show, I took a close look into the life and history of the 70s; particularly from the female perspective. I learned about the feminism and women's movement of the time, fashion, language, music, dance, and what the college experience at Mount Holyoke College in Massachusetts was like. I then applied this research to interpret the things Kate says and references in the text, how she carries herself, and how she feels about certain issues. For example, it is believed by one of Kate's closest friends that she styles herself after Katherine Hepburn in "Adam's Rib". I researched Hepburn's role in this film to discover her similarities with Kate and then used these shared aspects to influence my acting choices and create a more distinct personality. In my presentation, I will discuss this process of preparing myself for this role and the decisions I carried out in order to bring Kate to life on stage.

Presenter: Katie Jacobson
Project Adviser: Bart Finzel (Economics)
Title: Economic Underpinnings of Renaissance Italian Art
Type of Presentation: Oral Presentation
John Q. Imholte Hall, Room #112, 3:30 p.m.

In 1902, art historian, Aby Warburg, asserted that in Renaissance Italy, "works of art owed their making to the mutual understanding between patrons and artists. The works were, from the outset, the results of a negotiation between client and executant". This research seeks to examine patronage relationships in the context of politically fragmented Renaissance Italy to further our understanding of art's ability to promote political, ideological, or religious agendas. By referencing renowned works of art from the Italian Renaissance, I attempt to identify the significance of using culture and art as a rhetorical tool, rather than other more direct avenues, through economic inquiry. Contrary to a traditional patronage relationship pitting the interests of the patron and artist against one another, Renaissance Italy saw the unification of both parties' interest in appeasing contemporary, future, and heavenly audiences. I illustrate the advantage of adhering to the standards of each intertwined audience, as both patron and artist are able to present themselves as servants of both the city and God, affording them positions of great influence within their communities. Finally, I discuss the increase in demand of commissioned artworks to help demonstrate the prevalence of contending ideologies and agendas being advocated by the competing families sponsoring them. This research contributes to ongoing dialogue about an individual's ability to act as a message-sender in a changing rhetorical landscape.

Presenter: Kay Keegan
Project Adviser: Stephanie Ferrian (Dance)
Title: Dance in Higher Education: Journeying Away from the Fine Arts
Type of Presentation: Oral Presentation
John Q. Imholte Hall, Room #114, 2:50 p.m.

Trends regarding dance programs in higher education imply that dance is becoming more of a "liberal art" rather than a "fine art." Although dance is primarily seen as a means to express oneself through performance, I will be illustrating its functionality if it were studied more often at liberal arts institutions. My initial claim will be established by describing how dance is a deceptively interdisciplinary subject. Then, I will draw comparative and qualitative analysis on successful dance programs from the University of Minnesota, Twin Cities, and the University of Wisconsin, Milwaukee by employing a list of their required course listings for the major. Lastly, I will be creating course requirements for the best possible dance major at the University of Minnesota – Morris with the dance courses that are currently available, as well as courses from across other disciplines. In re-imagining dance curriculum within the liberal arts, I will create three tracks for students who display interest in the major. They include a performance and practicum track, a scholastic track, and a scientific track. By providing these concentrations, this theoretical dance program will meet the needs of many academic and artistically-centered students. Finally, I will conclude my presentation by commenting on the potential success of this program if it were implemented at UMM.

Presenter: Zachary Johnson
Project Adviser: Tisha Turk (English)
Title: Entering a Scholarly Conversation: Writing in Academic Discourse and the Production of Knowledge's in an Undergraduate First Year Classroom
Type of Presentation: Oral Presentation
John Q. Imholte Hall, Room #113, 2:30 p.m.

Faculty and student understandings of the importance of scholarly writing differ. Faculty focus a great deal on their expectations for student writing. Students want and appreciate learning to write scholarly because students are taking what they have learned in entry level writing courses and applying those skills in undergraduate classrooms. Learning to write as a scholar is a process and as such students and professors have different skill levels. This can create a disconnect where professors sometimes set standards too high for scholarly student writing. As a result, there can be tension between the students and the instructor. In short, I argue that this disconnect needs to be examined. This leads to a push for less scholarly writing and more of a focus on non-scholarly writing by scholars such as Peter Elbow. The theoretical underpinnings of my argument are found in Nancy Sommers and Laura Saltz who argue that students find that they can accomplish scholarly writing once they figure out the mechanics of certain writing. Because the researchers follow the entire undergraduate process, this research shows a holistic look at the students relationship with scholarly writing. I then consider published student writers who provide both pros and cons of writing showing that the disconnect is hindering the students ability to write scholarly. I conclude that we need to further consider the disconnect in order to bridge the gap between the expectations of faculty and students for scholarly student writing.

2014 Undergraduate Research Symposium

Presenter: Haley Van Cleve
Project Adviser: Tisha Turk (English)
Title: Teaching Access & Agency: Blogging toward Liberatory Feminist Praxis
Type of Presentation: Oral Presentation
John Q. Imholte Hall, Room #113, 3:10 p.m.

If feminism is first and foremost a social movement working toward gender equality, then the study of feminism in academia should translate directly into practicable actions. However, academic feminist discourse is currently inaccessible to students and people outside of academia because of confusing structure and jargon. In my paper, I propose teaching academic discourse that reflects Freire's liberatory praxis, or "action and reflection upon the world in order to transform it," by using the feminist blogosphere. Reading and writing in feminist blogs will help students to participate in more accessible academic conversations in order to produce more accessible knowledge. Learning through blogging will also help students understand that they have a stake in feminist conversations, producing a sense of agency for students. This sense of agency will help students to create discourse that will enable progressive change on our society. My paper begins with a theoretical explanation of why blogging is a useful teaching tool and then applies these theories to the feminist studies classroom. These practical applications will empower students to create feminist discourse that is politically useful outside of the academy and reflects feminism's activist history.

Presenter: Amanda Wiener
Project Adviser: Oscar Baldelomar (Psychology)
Title: Perceptions of the Green Consumer: A Cross-Cultural Comparison
Type of Presentation: Oral Presentation
John Q. Imholte Hall, Room #114, 4:10 p.m.

Pro-environmental, or "green" products, are a quickly growing sector in the modern market. Cross-cultural research on consumer behavior shows that in Western culture, green consumption is driven by desire to appear altruistic and wealthy to others. In contrast to the more individualistic Western world, it has been shown that collectivistic individuals are more likely to purchase green for the betterment of society. My research aims to investigate perceptions of green consumption in a Western context from both collectivistic and individualistic viewpoints. Are they perceived to be more altruistic than traditional shoppers by individualistic participants because the act of spending more to purchase something to benefit society is less common? Do the average typical demographics for the green consumer match the perceived demographics for green consumers and does this change across cultures? My research consisted of online surveyed responses from 172 UMM students (58 males and 114 female, of which 64 international students). As a part of the survey, students read product descriptions from a theoretical consumer and were then asked to answer questions about that consumer's altruism levels and about their personal cultural values (individualism-collectivism). In order to obtain a sample of collectivistic backgrounds, students from rural and international backgrounds were recruited. It was found that individualistic students viewed green consumers as more altruistic than their traditional counterparts. These results add to the previous literature on consumer behavior because they illustrate how cultural values influence perceptions of consumer behavior.

Presenter: Abigail Thebault-Spieker
Project Adviser: Ray Schultz (Theatre)
Title: The Dramaturgical Process for Uncommon Women: Feminist Issues in the 1970's
Type of Presentation: Oral Presentation
Humanities Fine Arts Building, Black Box Theatre, 2:30 p.m.

Uncommon Women was one of the first plays written about feminism, which reached mainstream popularity. The play is rife with contextual concepts about daily life in the 1970's in America. Thus it is necessary to research these concepts and convey this information to the actors, so they can understand and then accurately portray the life of a college student in the 1970's. The dramaturgical process will focus on three primary places of research. The most pressing is the deeper research into the seminal writings and books of key players of the time, such as Gloria Steinem, Betty Friedan, Germaine Greer, and Kate Millett. Next in line of importance is an understanding of the culture and student life of the Seven Sister Schools, where Uncommon Women is set. The third area of research will be into pop culture references, using primary sources such as Ms. Magazine and Holiday Magazine. As mentioned above, these three areas of research will provide the necessary context for the actors to accurately portray the experience of an elite collegiate female. My dramaturgical research will provide context for these actors, which will not only be evident in my presentation but also in the play which will be performed in the nights leading up to the Undergraduate Research Symposium. This is important because it will give me a chance to fully understand how my research affected the actors in their own process for developing their characters, which will in turn affect how I present my research.

Presenter: Aubrey Thole
Project Adviser: Julia Dabbs (Art History)
Title: Finding the "True" Titian
Type of Presentation: Oral Presentation
John Q. Imholte Hall, Room #112, 4:10 p.m.

Of all of the masters of the Italian Renaissance, one of the greatest was Tiziano "Titian" Vecellio, whose body of work is less well-known even though it exceeded those of other better known masters such as Leonardo da Vinci. While it is common for an artist's painting style to change over the course of his career, few change as drastically as that of Titian. Titian's earlier style is idealized, brilliantly hued, and reflects strong influence of the painting styles of other contemporaries such as Giovanni Bellini and Giorgione. However, in his late style Titian really comes into his own. His later painting technique is much more coarse and tactile, with a darker, earthier color palette. Such differences can be seen in comparing his earlier and later works such as *The Three Ages of Man* (1511-12) to *Shepherd and Nymph* (1575-76) and *St. Sebastian from the Polyptych of the Resurrection* (1522) to *Saint Sebastian* (1575). However, there is a long standing scholarly debate as to why his style changed. Some scholars attribute the changes evident between Titian's early and late works to a single cause. For example, Filippo Pedrocco claims that the change in style is the result of the tragedies the artist experienced in his old age. I will argue instead that all the various experiences and aspects of the artist's life must be synthesized together in order to understand his change in style and that only at the end of his career does one find the true Titian.

2014 Undergraduate Research Symposium

Presenter: Rachel Kollar
Project Adviser: Joel Eisinger (Art History)
Title: Modernist Portraiture: Gertrude Stein and Pablo Picasso
Type of Presentation: Oral Presentation
John Q. Imholte Hall, Room #112, 2:50 p.m.

My presentation explores the mutual portraits of Pablo Picasso and Gertrude Stein executed in their two very different media: painting and literature. The intellectual context of my presentation is modernist art; one major aspect of which is a spirit of technical and stylistic experimentation and another important aspect is a focus on the formal qualities of a given medium. Formal qualities are the most basic building blocks of a medium for example, line, shape, or visual rhythm in painting, and diction, sound, or rhythm in writing. Both Picasso and Stein were modernist pioneers in their fields. They knew each other well, and each made a portrait of the other using their respective media. Despite the differences between these media, I argue that Stein's and Picasso's approaches to portraiture are comparable due to their common interest in the modernist experimentation and focus on formal aspects of a medium. To my knowledge, I am the first to explore this idea. It is possible that Picasso and Stein influenced each other in making their portraits, given their social interaction. However, whether or not this was the case, the evidence for the similarities between their portraits of one another lies partially in how the two artists worked and more importantly in the portraits themselves.

Presenter: Mathea Krogstad
Project Adviser: Tammy Berberi (Honors)
Title: Introversion and Extroversion: A Study in Societies through History
Type of Presentation: Oral Presentation
John Q. Imholte Hall, Room #113, 3:50 p.m.

The contrast between introversion and extroversion is a major topic in discussions of human personality and individual differences. There is an abundance of literature regarding the topic, ranging from the physiological basis of the traits to the personal and social implications of being an introvert in the U.S, a culture that values extroversion. While introversion and extroversion are typically studied as individual traits, they do lead to differing values and lifestyles, impacting all areas of life. This study was undertaken because the discussion of how the two personality traits have influenced societies in the past is relevant to understanding society today. This study looked at the evidence of both introverted and extroverted values in three discrete time periods: religious practices in Europe during the Middle Ages, popular Romantic era British literature, and modern-day psychology. A literature review was conducted on the three time periods. After looking at the practices, values, and conflicts of these societies, this study concludes that the expression of both introverted and extroverted goals and lifestyles is essential to healthy societies. Both traits and their resulting lifestyles have necessary functions that make a society function as well as possible. A solid understanding of how introversion and extroversion have tied into societies in the past makes it possible to improve society today.

Presenter: Andrew Latterner
Project Adviser: Nic McPhee (Computer Science)
Title: Applying Machine Learning Techniques to Campus Energy Use and Production
Type of Presentation: Oral Presentation
Science Building, Room #1020, 11:00 a.m.

With the vast increase in our access to data, there is a benefit to being able to analyze, model, and understand this data. At the University of Minnesota - Morris, for example, there has been a significant increase in data gathering on wind turbine energy production and campus energy usage. One way to try to better understand this data is to apply machine learning techniques to create models that can help to explore relationships in the data. Machine learning entails creating models that can learn from past experiences to accurately classify or predict future situations. In the context of the campus' energy data, I have gathered large amounts of data related to energy usage and production from various campus sources. With this data, I plan to create models that learn from past energy usage on campus to predict future usage. Likewise, I plan to create a model that is able to predict future wind turbine energy production using past production patterns and weather data. After restructuring the data into a usable format, I have created a series of initial models. These models are not as accurate as they could be and, as such, the remainder of the research time will be spent improving the models by, for example, applying alternative machine learning techniques or transformations to the data. If the models are sufficiently accurate in their predictions, this model could help the campus to understand energy usage and production trends. For example, members of the campus community could choose to schedule activities that consume large amounts of electricity on days when the wind turbines are producing large amounts of power. This could include small jobs like student laundry or larger jobs related to campus heating.

Presenter: Josh Lozancich
Project Adviser: Seung-Ho Joo (Political Science)
Title: Finland's NATO Dilemma: The Question of NATO Membership
Type of Presentation: Oral Presentation
John Q. Imholte Hall, Room #111, 2:50 p.m.

In recent years, the North Atlantic Treaty Organization (NATO) has expanded from a military bloc that was once primarily made up of Western European countries to one that now includes countries from both Southern and Eastern Europe. However, expansion in the Nordic Region has not been seen in this time period. The last time that a country from this region joined NATO was during the organization's founding in 1949. Finland is one of two Nordic countries that is not currently a member of NATO. Nonetheless, Finland has increased its interaction with NATO in recent years. It has also seen neighboring Russia seeking to reassert itself on the international stage through aggressive and controversial foreign policy measures. Some fear that such measures could potentially be used by Russia against Finland. As a result, debate has increased within in Finland as to whether or not Finland should join NATO to better protect the country militarily. To answer this question about NATO membership, I examined academic research, news articles, and data from other scholarly sources. I found that while joining may pose some security risks, Finland would stand to benefit in several ways from NATO membership. Given that Finland has been warned by Russia on joining NATO, Finland's membership would also have potentially negative implications on relations between NATO and Russia. However, I believe that given Finland's role as an international mediator, Finland could help NATO not only establish peace with Russia, but also seek to establish peace in volatile regions of the world.

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Presenter: Carolyn Sibbald
Project Adviser: Sarah Buchanan (French)
Title: Silences and Secrets: Examining Flashbacks in Moufida Tlatli's "The Silences of the Palace"
Type of Presentation: Oral Presentation
John Q. Imholte Hall, Room #113, 3:30 p.m.

This paper explores the film "The Silences of the Palace" (1994) by Tunisian director Moufida Tlatli. The film follows a young singer as she returns to her childhood home, a palace of the former bey, the head of the ruling body in Tunisia. There she experiences numerous flashbacks allowing her to relive her childhood in the palace. In this paper, I use Anne Donadey's claim that the flashbacks function as a structuring mechanism for the film and more importantly as a symptom of the protagonist's posttraumatic stress disorder. I also use Florence Martin's thesis that pain is transmitted from mother to daughter and that the past can invade the present through flashbacks. Finally, I use Sonia Assa's and Tlatli's arguments that parents are the source of the transmission of traumas. Building on the ideas of these critics and engaging in a close textual reading, I will argue that although the flashbacks add structure and are a means for the protagonist to revisit her childhood, they also allow for the transmission of sexual traumas from mother to daughter and for the sharing of strength to oppose these traumas. Further, the flashbacks actively involve the spectators themselves in the experience of this trauma. Scholars in this field have primarily focused on aspects of memory and history within the film. I build on their theories and add the spectator claiming a breach of the screen to allow the audience to be immersed by the film.

Presenter: Heidi Swanson
Project Adviser: Pieranna Garavaso (Philosophy)
Title: Bats, Experience, and Memory: Tension in Nagel's Proposal for Objective Completion of the Self
Type of Presentation: Oral Presentation
John Q. Imholte Hall, Room #114, 3:50 p.m.

Contemporary philosopher Thomas Nagel (New York University) argues that the features of any experience can only be understood by actually occupying the position of the subject of that experience. This view is illustrated in his landmark paper "What Is It Like to Be a Bat?". Later, in his book The View from Nowhere, Nagel introduces the possibility of "objectively completing" the self. The project of "objective completion" would require that all subjects of experience, or selves, could be objectively described as a "type of ___" in the same way that all individual pieces of gold can be objectively described as a "type of metal," a label based on the physical and atomic properties unifying all pieces of gold. The unifying properties of selves are unclear, but if these properties could be known, it seems that the features of experience, which collectively define the self, would be known essentially through memory. I argue that experiencing a memory is a step removed from the features of the experience itself. Therefore, knowledge of one's own self is inaccessible in the same way that Nagel claims that knowledge of others' selves is inaccessible. Developing an objective descriptor for selves would require that individuals can know the defining features of their own selves, so if individuals cannot access the essential features of their own experiences, then a unified descriptor for all individual selves is epistemologically inaccessible.

Presenter: Michael Prideaux
Project Adviser: Dan Demetriou (Philosophy)
Title: The Pink Rope: Feminism, Sex Positivity, and the Morality of BDSM
Type of Presentation: Oral Presentation
John Q. Imholte Hall, Room #111, 3:30 p.m.

BDSM (bondage, discipline, and sadomasochism) refers to a constellation of "kinky" sexual practices emphasizing role-play, domination, and submission. E.L James's novel Fifty Shades of Grey has made BDSM mainstream. But while BDSM is now visible, are the relationships depicted within it ethical? The purpose of this presentation will be to evaluate the moral permissibility of BDSM from an analytical feminist perspective. BDSM-critical feminists are concerned by the fact that in most heterosexual BDSM relationships, women are submissive and men are dominant. They are also troubled by the way BDSM welcomes power-disparities and even violence into sexual relationships. I argue that these criticisms ignore an important distinction between dominance and oppression, only the second of which is morally impermissible in sexual relationships. Moreover, I evaluate and criticize liberal sex ethics, specifically the concept that sex is something which is fundamentally not significant. I abandon this in favor of a feminist sex positive ethic, which focuses on making sex liberating as well as enjoyable. This ethic, I argue, necessarily entails the permissibility of some forms of BDSM. I thus conclude that BDSM is compatible with feminist values.

Presenter: Arundathi Rao
Project Adviser: Farah Gilanshah (Sociology)
Title: Understanding Ethnic Conflict in Africa through Studying the Histories of Rwanda and Sudan
Type of Presentation: Oral Presentation
John Q. Imholte Hall, Room #113, 2:30 p.m.

The purpose of this research is to investigate the historical and sociological factors that contribute to ethnic conflict in Africa. This research is significant because ethnic conflict often escalates into violence and has serious and lasting negative impacts, as seen in the cases of Rwanda and Sudan. Ethnic conflict is defined here as violence taking the form of genocide and ethnic cleansing in countries such as Rwanda and Sudan. The method of research in this study is based on both qualitative and quantitative methods. First, extensive literature research was done on the histories of both nations. Next, the results of the literature review were analyzed through content analysis to find the patterns of similarities and dissimilarities between the two nations based on historical background and the nature of ethnic conflict. The findings suggest that while the histories of Rwanda and Sudan are dissimilar, both countries share characteristics such as the existence of ethnic dichotomies and power/resource sharing issues between different ethnic groups. Karl Marx's sociological perspective, conflict theory, was employed to explain as to how these shared circumstances led to tensions and violence in the two nations. The patterns found suggest that ethnic conflict can be predicted and prevented by properly equipped outside forces such as the United Nations. However, future research is needed to test the theory on ethnic conflict in other African nations. Other avenues of research include investigation of the influence of outside nations on the outcome of this type of conflict in Africa.

2014 Undergraduate Research Symposium

Presenter: Patrick Malone
Project Adviser: Bibhudutta Panda (Economics)
Title: Child Health and Household Income
Type of Presentation: Oral Presentation
John Q Imholte Hall, Room #111, 3:50 p.m.

Health economics literature is rich with studies that document a strong positive association between childhood health and household income. This substantiates the claim that children of wealthier families are healthier. This positive association gets even stronger as children grow older. In economic terminology, the income gradient of health gets steeper as children age. This phenomenon is explained by the arrival of chronic conditions (such as Bronchitis, Asthma, and Hay Fever etc.) which becomes prevalent with age. The intuition behind this argument is that children from poor households are more susceptible to chronic conditions. As chronic health conditions arrive, the poorer children are more prone to poorer health outcomes in absence of proper medication and living environments. The primary objective of this study is to examine how the income gradient of health has changed in recent years given that the last two decades have seen a widespread expansion of health insurance coverage. To achieve this objective, this study creates a comprehensive data set on childhood health outcomes and household socioeconomic status using the National Health Interview Survey (NHIS) data for 2006-2012.

Presenter: Matthew McDonough
Project Adviser: Ray Schultz (Theatre)
Title: Process of Doing a Sound Design for a Theatrical Show
Type of Presentation: Oral Presentation
Humanities Fine Arts Building, Black Box Theatre, 2:45 p.m.

My goal as a sound designer is to evoke emotion and reaction, through the music effects, from the audience during a production. My presentation will be divided into two parts covering my sound design process for the Theatre Discipline's spring production of "Uncommon Women and Others". The first section will be on the research that went into finding and selecting music that fits the time period of the play and gets the audience invested in the show. The second section of the presentation will focus on the research and editing process that goes into finding and selecting sound effects including: effects that need to be recorded live, pre-recorded effects that need to be edited, and effects that I need to engineer. A sound designer must go through a long process of research, analysis, selection, and implementation in order to do his or her job effectively. I want the audience to become a participant in the world of the play. I want the audience to feel as though they can sing along with the music and follow the cast's journey back to the past through the music I have chosen. This is a memory play where the characters retell integral moments from their past, which can be carefully motivated and experienced by the audience through profound choices of music and effects.

Presenter: Travis Moret
Project Adviser: Oscar Baldelomar (Psychology)
Title: Perceptual Differences of Nonverbal Cues Across Cultures
Type of Presentation: Oral Presentation
John Q. Imholte Hall, Room #114, 3:10 p.m.

Researchers are interested in body language and its perception because of its prevalence in communication and interactional importance. Knowledge can ensure that individuals maximize their interactions with others by accurately reading feelings and properly conveying their own. However, research comparing cultural differences in nonverbal communication needs more exploration. The goal of this experimental study was to examine cultural differences in perception of body language including: what is perceived as attractive between cultural orientations (individualism/collectivism), differences in identification of emotional expressions, and difference in body and face cues in perceiving feelings. An online survey was administered to 58 male, 110 female and 2 other international and domestic University of Minnesota – Morris students with a mean age of 20.69. First, participants matched faces with emotions. Second, participants viewed images with incongruent facial and body expressions, such as a sad face and angry body pose. Participants chose which expression best fit the individual's feelings. Third, participants rated photos of individuals displaying open, closed, dominant, and submissive poses on a Likert scale for attractiveness. Finally, participants completed a questionnaire on cultural orientation. Expected results include cultural variation between individualistic and collectivistic cultures measured by accuracy in identification of facial expressions and attractiveness perceptions of body language poses. Other expected findings include data which supports more individuals use the face as a cue to interpret nonverbal communications than the body. Data is expected to support this hypothesis due to the diversity of the Morris campus. Nonverbal communications are essential to social interaction and examining these differences may benefit interpersonal interactions.

Presenter: Adiroopa Mukherjee
Project Advisers: Farah Gilanshah (Sociology) and Roger Rose (Political Science)
Title: The Battle Against Female Genital Mutilation
Type of Presentation: Oral Presentation
John Q. Imholte Hall, Room #111, 3:10 p.m.

World Health Organization reports suggest that approximately 101 million girls under the age of ten have undergone Female Genital Mutilation (FGM) in Africa alone. FGM comes to the forefront as a direct violation of every woman's basic human rights to a good, healthy, and painless existence, free from discrimination. Most studies focus on a medical approach to FGM. They show that the practice causes several serious diseases and fatal health risks through the use of unsterilized non-surgical instruments and environments, which lead to infertility, genital infections, psychological problems, and death. My research focuses on the less studied socio-legal aspects of FGM. I will present an up-to-date investigation on the association between current FGM laws and their relationship with political situations and cultural practices in Ethiopia, Egypt, Somalia, and Sudan. For example, I will evaluate whether the laws of these countries meet international and domestic standards of Human Rights. In addition, I will briefly discuss reasons behind the failure to contain FGM and will address ways to mitigate the menace of FGM through education and raising awareness of the issue. Our understanding of these issues is crucial since scholarly literature shows that in countries that already have legal measures against the practice, societal pressure to conform is cited as the main reason for continuing the practice.

Presenter: Erica Mumm
Project Adviser: Leslie Meek (Biological Psychology)
Title: Genetic Mutation vs Infectious Disease: Aid from an Unexpected Place
Type of Presentation: Oral Presentation
John Q, Imholte Hall, Room #112, 3:10 p.m.

Scholars have noted that consanguineous relationships, which are often seen in a negative light, can actually be beneficial because they allow for passing on of alpha-thalassemia, a genetic disorder that can provide protection against the transmitted disease of malaria. Although alpha-thalassemia can be lethal when all four alleles for the disease are inherited, individuals who only inherit 1-3 alleles for alpha-thalassemia have minimal symptoms and are better able to survive attacks of malaria. Most of the studies that have been done on the relationship between alpha-thalassemia and malaria utilize computer models with set levels of inbreeding. This is important because my research has shown that the effect that consanguineous relationships have on a population changes over time depending on the frequency with which they occur. As the rate of inbreeding in a population stabilizes, the genetic outcome will change. For example, the alpha-thalassemia trait will still be passed on, but will be more likely to occur in its mild form. My review of the literature found that large amounts of infrequent inbreeding work best to increase the prevalence of the alpha -thalassemia trait when malaria first arrives in an area, and that consistent levels of inbreeding work best to perpetuate the trait in areas with endemic malaria. As global health advances and socio-economic conditions improve, it is becoming increasingly important to study these effects and their impact on a given population.

Presenters: Elizabeth Pappenfus
Project Adviser: Oscar Baldelomar (Psychology)
Title: Latinos' Health Perceptions: A Cross-Cultural Analysis
Type of Presentation: Oral Presentation
Science Building, Room #2200, 11:40 a.m.

The purpose of my study is to examine how Latinos' cultural health beliefs impact their illness behaviors in a rural setting in comparison to White individuals. Illness behavior is defined as the manner in which a person monitors their body, interprets their symptoms, and their reactions to those symptoms. Although Latino immigrants suffer from higher rates of treatable diseases, they are largely underutilizing the healthcare system in the U.S. The Andersen model of healthcare utilization is the most commonly used model for predicting utilization based on the person's environment (i.e. healthcare system) and personal characteristics (i.e. personal need, available resources, predisposing characteristics). Many studies across the U.S. have looked at health disparities within the Latino immigrant population, specifically looking at issues within the healthcare system and other physical barriers to receiving healthcare (e.g. socioeconomic or immigration status). However, no studies have explored illness behaviors and how the Latino culture impacts these behaviors. We sampled the Steven's County Latino female immigrant population (roughly 500 individuals) about their cultural health beliefs in an American healthcare system by using free-listing questions, rankings of importance of health behaviors, and closed survey questions. Our hypothesis compared to Euro-American women, Latinas' healthcare utilization is largely dependent upon their access to healthcare and health insurance (as previous studies have shown), their decision to utilize health facilities also relies on their cultural socialization of illness behaviors. Recognizing this additional factor will allow local health facilities to find better ways to communicate and encourage health utilization to this population.
