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Conference

2012, 23rd Annual JWP Conference

Apr 14th, 8:00 AM - 4:00 PM

Complete 2012 Program

Illinois Wesleyan University

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CENTER FOR
NATURAL SCIENCES
SATURDAY
APRIL 14, 2012

<http://www.iwu.edu/jwprc>

The conference is named for explorer and geologist John Wesley Powell, a one-armed Civil War veteran and a founder of the National Geographic Society who joined Illinois Wesleyan University's faculty in 1865. He was the first U.S. professor to use field work to teach science. In 1867 Powell took Illinois Wesleyan students to Colorado's mountains, the first expedition of its kind in the history of American higher education. Later, Powell was the first director of the Smithsonian Institution's Bureau of Ethnology.

Twenty-Third Annual

John Wesley Powell • IWU

Student Research Conference

Center for Natural Sciences and Ames Library

Saturday, April 14, 2012

8:30 a.m. – 4:00 p.m.

Official Program

ACKNOWLEDGEMENTS

The John Wesley Powell Research Conference Committee would like to acknowledge the contributions of several individuals.

This conference could not have been a success without the contributions of Pat Neustel, Associate Provost's Office, in organizing many aspects of the conference and assembling and printing the program booklet.

The invaluable assistance provided by Mike Welsh and his staff at Sodexo Campus Services in setting up breakfast, luncheon and other refreshments is gratefully acknowledged.

The assistance provided by Patrick McLane of Information Technology in setting up computer equipment in all rooms is greatly appreciated.

John Wesley Powell Research Conference Committee:

- Leah Nillas (Educational Studies)
- Stephanie Davis-Kahl (Library)
- Amit Ghosh (Economics)
- Jeungbo Shim (Business Administration)

SCHEDULE OF EVENTS

Saturday, April 14, 2012

8:30 a.m.	Continental Breakfast and Poster Setup	Science Commons and Ames Library
9:00 a.m.	Poster Session A	Science Commons
	Educational Studies Posters –Session 1	Ames Library
10:00 a.m.	<i>Oral Presentations – Session One</i>	CNS and Ames Library
11:00 a.m.	Educational Studies Posters –Session 2	Ames Library
11:00 a.m.	<i>Oral Presentations – Session Two</i>	CNS
11:00 a.m.	Music Student Composition Performance	CNS C101
12:15 p.m.	Luncheon	Main Lounge
1:15 p.m.	Keynote Address: Dr. Matt Troyer '86	Anderson Auditorium-CNS C101
2:30–3:45 p.m.	Poster Session B	Science Commons
2:30–4:00 p.m.	Senior Art Show and Critique	Merwin and Wakeley Galleries

KEYNOTE SPEAKER

“Probing Classical Physiology with New Tools: Case Studies in Translational Medicine”

Matthew D. Troyer, M. D.
Senior Director and Neuroscience Leader, Department of Clinical Pharmacology
Merck & Co, Inc.

1:30 pm
Anderson Auditorium (C101)

Dr. Troyer is Senior Director and Neuroscience Leader in the Department of Clinical Pharmacology at Merck Research Laboratories. In this role, he is responsible for supervising the early clinical development of promising new treatments for neurological and psychiatric disorders. Matt works with basic and translational scientists during drug discovery and biomarker development to support novel therapeutic programs. In these roles, Matt has been fortunate to collaborate with a broad range of basic scientists, imaging experts, pharmacokineticists, modeling and simulation experts, clinicians and academics. Since joining Merck in 2005, Matt has also contributed to the clinical development of investigational drugs in the areas of diabetes, women's health, obesity and infectious disease.

Prior to 2005, Matt was a member of the Neurology faculty at the University of California, San Francisco, and an attending neurologist in the Parkinson's Disease Clinic. At UCSF he also completed a postdoctoral fellowship in the laboratory of Robert Edwards where he studied vesicular neurotransmitter transporter function and mechanisms of neurodegeneration in Parkinson's disease. Dr. Troyer's clinical training includes a fellowship in Parkinson's disease and Movement Disorders at the Institute of Neurology/Human Movement and Balance Unit, Queen Square, London, and residency at the Harvard-Longwood Area Neurology program where he served as Chief Resident in 1995-1996.

Matt received his medical education at Stanford University in 1992, and graduated from Illinois Wesleyan University with a major in Biology in 1986. His research interests are in the following areas: therapeutics in neurology and psychiatry, neurodegenerative diseases including Alzheimer's and Parkinson's diseases, translational medicine, novel clinical trial designs, central nervous system biomarker development, and model-based drug development.

STUDENT PARTICIPANTS

Oral and Poster Presentations

Brooke Alba	P1	Caitlin Eskew	ES
Catlin Arrington	P3, P5	Josephine Fairall	P7, P9
Mackenzie Astling	O2.3	Amy Fairgrieve	O13.2
Lauren Awdziejczyk	P3, P4, P5	Krista Felten	ES
Neil Baldwin	P6	Katherine Filippo	P15
Jonathan Bates	O5.4	Ethan Fischer	Music
Jazmyn Becker	ES	Samantha Ford	ES
Ben Becker	P7, P9	Kati Forman	P3, P5
Katherine Bell	ES	Kirsten Fredrickson	ES
Chelsey Belt	O12.4	Hannah Freeman	O7.2
Brooke Bernardoni	P11	Anne Fritsch	ES
Melissa Bittner	ES	Kristen Gattuso	ES
Matthew Bockman	P11	Ethan Gelke	P3, P5
Anthony Bohner	P3, P5	Tommy Gilbert	ES
Elyse Borchik	P3, P5	Brittany Goldman	O11.4
Jessica Bozek	ES	Brittany Gonio	ES
Rachel Branson	O12.3	Timothy Gordon	ES
Kelsey Rae Brattin	O8.4	Jessica Gorecki	ES
Alan Brus	O1.4	Susan Hager	ES
Julie Anne Canter	P3, P5	Sarah Beth Hartman	P7, P9
Kelly Cantlin	O6.3	Elise Haury	P7, P9
Sarah Carlson	P8	Steven Hayman	P17
Caitlin Carpenter	ES	Tung Hoang	O9.3
Jonathan Castro	P10	Ryan Holden	P3, P5
Michael Chau	O9.2	Erin Howes	O12.1
Brittany Childs	O1.3	Dariusz Jakubowski	P16
Lauren Cowles	ES	Jenna Jameson	ES
Kaileen Cummings	O6.1	Qingfan Jiang	Music
Claire Current	ES	Cassandra Jordan	P18
Patrick Dahl	O5.1, P26	Lizabeth Kaeb	P1
Joseph Daniels	P12	Taylor Kaldahl	O4.4
Elizabeth Daniels	P13	Courtney Keenan	ES
Crystal Diaz	P3, P5	Nick Kenaga	O5.3
Meara Dibadj	O4.2	Julie Klink	O9.1
Robert Diehl	P46	John Koschnitzky	ES
Qing Ding	P14	Andy Kozlowski	ES
Jeremy Duffee	O8.3	Stephanie Krausen	ES
Mary Edwards	ES	Samantha Krueger	ES

continued.....

Natalie Lalagos	O13.4	Lauren Rupert	O6.1
Kent Larson	O9.1, O4.3	Alan Russian	P31
John Laughlin	P19	Ryo Sakamoto	O11.3
Olivia Lett	ES	Alyssa Schardt	P32
Joe Lim	P20	Emily Schimick	ES
Boxiang Liu	P22, P45	Emily Schmidt	ES
Elizabeth Liubicich	O8.4	Dan Schouten	O4.1
Blake Logan	ES	Jennifer Schreiber	P33
Devin Long	O11.1	Katelyn Scott	P34
Maxwell Lustick	P21	Kevin Seske	O3.2
Tracy Lytwyn	O1.1	Victoria Simmons	P35
Jordyn Maglalang	O10.3	Cory Sloan	O2.1
Kayla Mahoney	ES	Samantha Sorenson	P3, P5
Ammar Malik	O10.1	Jacob Starcevich	P19
Alejandro Mancera	P10	Ali Stevenson	P2
Michael Mann	O11.2	Amanda Stoeke	ES
Cydnee Mann	P2	Conor Strejcek	Music
Daniel Maurer	O3.3	Jaclynn Sullivan	P36
Katy McCortney	P23	Mary Tackett	ES
Caroline McMahon	ES	Sevasti Tagaris	ES
Matthew McShane	P24	Sarah Takushi	O3.4, P44
George Mitchell	ES	Scott Tesler	P7, P9
Sarah Moir	O7.1	Janak Thapa	P14
Alejandro Monzon	O8.2	Kathryn Thomas	P7, P9
Brandon Moore	O6.1	Edward Thome	O10.2
Aaron Moore	P25	Megan Thompson	O8.1
Carl Mueller	P26	Anneliese Tillmann	ES
Munia Mustafa	P3, P5	Onyinye Udenze	O9.1
Nathaniel Nesbit	P22	Karin Unruh	ES
Ryan Nielsen	O7.3	Erin Vogel	P37
Anna Nord	P27	Da Wang	P3, P5, P38
Alison Novakow	P1	Chen Hon Wang	P39
Sean O'Bryan	O3.1	Andrew Werkema	ES
Brendan O'Donnell	P28	Stephen Whitfield	P3, P5, P41
Cameron Ohlendorf	O5.2	Amanda Williams	O13.1
Kristyn Paradis	P29	Hannah Williams	P40
Sarah Pierpoint	ES	Korey Williams	O13.3
Brian Piotrowski	O2.2	Elizabeth Williams	P42
Jarod Pope	O1.2, P30	Natalie Witter	P1
Katherine Racanelli	O6.2	Malory Wodka	P7, P9
Robert Rachford	ES	Yujie Wu	O9.4
Jenifer Rank	ES	Cody Wynn	P43
Tim Reardanz	O2.3	Yuliana Zaikman	P47
Caroline Rohloff	O12.2		
Stephen Rudnicki	ES		

**BA/BFA SENIOR CRITIQUE HONORS
SCHOOL OF ART**

Saturday, April 14, 2012, 2:30 p.m., Merwin and Wakeley Galleries

Student Presenters:

Amber Sipich

Katya Kobrina

Sherri Strandberg

Refreshments will be served

MUSIC COMPOSITION STUDENT PRESENTATIONS

**Saturday, April 14
11 AM
Center for Natural Sciences C101**

Four Strings

Ethan Fischer '15

Gabriella Pittsford, violin
Alicia Gummess, viola
Rebecca Blumer, violoncello
Todd Anderson, contrabass

Memory

Conor Strejcek '14

Largo Grazioso
Lamenting
Allegro

Jordan Pettis, Gabriella Pittsford, violin
Alicia Gummess, viola
Rebecca Blumer, violoncello

**12:15 p.m.
Young Main Lounge, Memorial Student Center
(as part of conference luncheon program)**

from Moments Musicaux
I. Adagio

Qingfan Jiang '12

Juan Hernandez, clarinet
Qingfan Jiang, pian

Music Presentation

FOUR STRINGS

Ethan Fischer and David Vayo*
School of Music, Illinois Wesleyan University

Four Strings is a composition created without any particular mood, inspiration, or concept in mind. My only real goal was to write a string quartet. But not until after writing much of the piece did I realize that my concept of a string quartet was off. Thus, the title *Four Strings* reflects the fact that this is simply a composition for four stringed instruments: a violin, viola, cello, and bass. There are four different sections, each portraying a distinctive style. The final section reuses some of the previously established melodies and ties up the piece to meet its conclusion.

Music Presentation

MEMORY

Conor Strejcek and David Vayo*
School of Music, Illinois Wesleyan University

Memory is a three movement work for string quartet. I wrote this piece in honor of my grandmother who recently passed away. Each movement is representative of a different emotion I felt after hearing the news, and the feelings I had as I looked back upon memories I had with her. The first movement is about my memories as a child, when my grandmother would babysit for my brother and me, the second is about the grief experienced from the loss of a loved one, and the third is a celebration of her life. While this piece was specifically written for my grandmother, I believe it can apply to anyone who has lost a loved one.

Music Presentation

MOMENTS MUSICAUX

Qingfan Jiang and David Vayo*
School of Music, Illinois Wesleyan University

Written in September and October 2011, *Moments Musicaux* is a composition for clarinet and piano. It consists of two movements with each four to five minutes in length. This composition, as the title suggests, are brief musical pieces, or “moments.” It is by no means a clarinet sonata bearing comparison to Brahms’s or Poulenc’s. Rather, it is a miniature duo for these two instruments. While both movements are intended to highlight the lyrical quality of the clarinet, the first movement carries a more melancholic and somber mood. Besides providing harmonic foundation, the piano part interweaves with the clarinet melody, creating a three-voice-counterpoint.

ORAL PRESENTATIONS - SESSION 1
10:00 – 11:00
CENTER FOR NATURAL SCIENCES (E101)
MODERATOR: Jarod Pope

- 1.1 Tracy Lytwyn
- 1.2 Jarod Pope
- 1.3 Brittany Childs
- 1.4 Alan Brus

ORAL PRESENTATIONS - SESSION 2
10:00 – 11:00
CENTER FOR NATURAL SCIENCES (E102)
MODERATOR:

- 2.1 Cory Sloan
- 2.2 Brian Piotrowski
- 2.3 Tim Reardanz and Mackenzie Astling

ORAL PRESENTATIONS - SESSION 3
10:00 – 11:00
CENTER FOR NATURAL SCIENCES (E103)
MODERATOR: Sarah Takushi

- 3.1 Sean O Bryan
- 3.2 Kevin Seske
- 3.3 Daniel Maurer
- 3.4 Sarah Takushi

ORAL PRESENTATIONS - SESSION 4
10:00 – 11:00
CENTER FOR NATURAL SCIENCES (E104)
MODERATOR: Dan Schouten

- 4.1 Dan Schouten
- 4.2 Meara Dibadj
- 4.3 Kent Larson
- 4.4 Taylor Kaldahl

ORAL PRESENTATIONS - SESSION 5
10:00 – 11:00
CENTER FOR NATURAL SCIENCES (E105)
MODERATOR:

- 5.1 Patrick Dahl
- 5.2 Cameron Ohlendorf
- 5.3 Nick Kenaga
- 5.4 Jonathan Bates

ORAL PRESENTATIONS - SESSION 6
10:00 – 11:00
CENTER FOR NATURAL SCIENCES (E106)
MODERATOR: Lauren Rupert

- 6.1 Lauren Rupert, Kaileen Cummings, and Brandon Moore
- 6.2 Katherine Racanelli
- 6.3 Kelly Cantlin

ORAL PRESENTATIONS- MUSIC- SESSION 7

10:00 – 11:00

CENTER FOR NATURAL SCIENCES (C102)

MODERATOR: Sarah Moir

- 7.1 Sarah Moir
- 7.2 Hannah Freeman
- 7.3 Ryan Nielsen

ORAL PRESENTATIONS - SESSION 8

11:00 – 12:00 noon

CENTER FOR NATURAL SCIENCES (E101)

MODERATOR: Kelsey Rae Brattin

- 8.1 Megan Thompson
- 8.2 Alejandro Monzon
- 8.3 Jeremy Duffee
- 8.4 Elizabeth Liubicich and Kelsey Rae Brattin

ORAL PRESENTATIONS - SESSION 9

11:00 – 12:00 noon

CENTER FOR NATURAL SCIENCES (E102)

MODERATOR: Kent Larson

- 9.1 Julie Klink, Kent Larson, and Onyinye Udenze
- 9.2 Michael Chau
- 9.3 Tung Hoang
- 9.4 Yujie (Eunis) Wu

ORAL PRESENTATIONS - SESSION 10
11:00 – 12:00 noon
CENTER FOR NATURAL SCIENCES (E103)
MODERATOR: Jordyn Maglalang

- 10.1 Ammar Malik
- 10.2 Edward Thome
- 10.3 Jordyn Maglalang

ORAL PRESENTATIONS – SESSION 11
11:00 – 12:00 NOON
CENTER FOR NATURAL SCIENCES (E104)
MODERATOR: Brittany Goldman

- 11.1 Devin Long
- 11.2 Michael Mann
- 11.3 Ryo Sakamoto
- 11.4 Brittany Goldman

ORAL PRESENTATIONS – SESSION 12
11:00 – 12:00 NOON
CENTER FOR NATURAL SCIENCES (E105)
MODERATOR: Rachel Branson

- 12.1 Erin Howes
- 12.2 Caroline Rohloff
- 12.3 Rachel Branson
- 12.4 Chelsey Belt

ORAL PRESENTATIONS – SESSION 13
11:00 – 12:00 NOON
CENTER FOR NATURAL SCIENCES (C102)
MODERATOR: Amanda Williams

- 13.1 Amanda Williams
- 13.2 Amy Fairgrieve
- 13.3 Korey Williams
- 13.4 Natalie Lalagos

ORAL PRESENTATIONS – MUSIC – SESSION 14
11:00 – 12:00 NOON
CENTER FOR NATURAL SCIENCES (C101)
MODERATOR: Ethan Fischer

- 14.1 Conor Strejcek
- 14.2 Ethan Fischer
- 14.3 Qingfan Jiang (performance at the luncheon)

ORAL PRESENTATIONS – EDUCATIONAL STUDIES
BECKMAN AUDITORIUM, AMES LIBRARY
MODERATOR: Tristan Rogers

Mary Tackett
Jazmyn Becker
Timothy Gordon

Presentations are 10-15 minutes in length. If time permits, there will be a question-and-answer period for all presenters following the final presentation.

Oral Presentation O1.1

**THE PERSONALITY OF POLICY PREFERENCES: ANALYZING THE
RELATIONSHIP BETWEEN MYERS-BRIGGS PERSONALITY TYPES AND
POLITICAL VIEWS**

Tracy Lytwyn and Tari Renner*

Political Science Department, Illinois Wesleyan University

For political scientists and politicians alike, much research has been devoted to get inside the head of the American citizen. Understanding this is the key to capturing votes, pushing forward new ideas, and retaining support in years to come. This project centers on the theory that people structure their political opinions around problem-solving tendencies they apply to everyday situations. To evaluate this idea, this study uses the Myers-Briggs Type Indicator (1962) in addition to several questions regarding personal policy preferences to determine whether there is a significant correlation between certain elements of one's personality and political ideas. In controlling for political knowledge as well as tolerance of ambiguity (Budner 1962), it was found that an individual exhibits clear political preferences based certain parts of their Myers-Briggs type as well as these two factors. The results of this study imply a more applicable fusion of psychology and politics.

Oral Presentation O1.2

**OMEGA-3 FATTY ACIDS LIMIT HYPOXIA INDUCED LOSS OF GAP JUNCTIONS
VIA NFK-B PATHWAY**

Jarod Pope and William Jaeckle*

Biology Department, Illinois Wesleyan University and
Harvard Medical School and Beth Israel Deaconess Medical Center
Boston, Massachusetts

This study aims to evaluate the restorative and preventive effects of Omega-3 fatty acids during hypoxic events in the heart also known as myocardial infarctions. Docohexanoic acid, DHA, is a major form of Omega – 3 fatty acid and is an essential amino acid that is consumed in diets rich in fish or via dietary supplement. These connexin proteins constitute gap junctions between cardiac myocytes allowing for both intra-cellular communication and the conduction of ions that allow for the propagation of the electrical impulse responsible for the regular heartbeat. During an arrhythmia the heartbeat becomes irregular and these connexin proteins lateralize thus preventing communication and impeding the conduction of the electrical impulse resulting in a deleterious irregular heartbeat. In addition to connexin proteins, the NFK-B (Nuclear Factor Kappa Beta) pathway is activated during cardiac hypoxia. Conformational changes in the NFK-B protein allows for direct targeting of the molecule to the nucleus in turn causes protein level changes and transcriptional modification.

Oral Presentation O1.3

COMPARISON OF REGIONAL EGGSHELL POROSITY BETWEEN THE BROOD PARASITIC BROWN-HEADED COWBIRD (*MOLUTHRUS ATER*) AND ITS HOSTS: THE DICKCISSEL (*SPIZA AMERICANA*), AND TWO NON-PARASITIC RELATIVES, THE RED-WINGED BLACKBIRD (*AGELAIUS PHOENICEUS*) AND THE COMMON GRACKLE (*QUISCALUS QUISCULA*).

Brittany Childs^a, W.B. Jaeckle^{a*}, R.G. Harper^{a*}, M. Kiefer^a, J.W. Rivers^b, B.D. Peer^c

^aDepartment of Biology, Illinois Wesleyan University, Bloomington, IL

^bDepartment of Forest Ecosystems and Society, Oregon State University, Corvallis, OR

^cDepartment of Biological Sciences, Western Illinois University, Macomb, IL

The Brown-headed Cowbird is a generalist brood parasite that lays eggs in the nests of many host species, including the Dickcissel and two non-parasitic relatives: the Red-winged Blackbird and the Common Grackle. Cowbird eggs reportedly hatch sooner than equivalently-sized host eggs, presumably via accelerated embryonic development enabled by a greater eggshell porosity and consequently greater gas exchange. The distribution of pores among apical, equatorial and basal eggshell regions within cowbirds and host species is undetermined. We tested the hypothesis that equatorial porosity would be greatest because respiratory gases cross the eggshell and enter or exit the embryo's circulatory system in that region. We found that, when normalized to mass, cowbird eggshells had significantly greater pore area and porosity in equatorial regions compared to its three hosts ($p \leq 0.001$). Cowbird eggshells had greater apical pore area than the hosts ($p < 0.04$) but equivalent basal pore area ($p > 0.09$) and porosity ($p > 0.15$) to its relatives.

Oral Presentation O1.4

**A NEW SPECIES OF FROG (STRABOMANTIDAE: *PRISTIMANTIS*) FROM PERU
WITH COMMENTS ON ITS ECTOPARASITES (ACARI: TROMBICULIDAE)**

Alan Brus and Edgar Lehr*
Biology Department, Illinois Wesleyan University

In South America, frogs are rarely reported with epidermal infections. Trombiculid mites, commonly known as chiggers, are the most common parasites of frogs in North and South America and are typified by a parasitic larval stage. Adult stages of these mites are predaceous and free living in the soil. A large series of a new species of frog, obtained from the Río Abiseo National Park in northern Peru, was heavily infected with Trombiculid mites. This gave us the opportunity to determine any relation among the number of infections and body regions, size, sex, and age. No relationships were found among the number of infections and the sexes or ages of frogs. Larger females were 3.85 times more likely to be infected than small females, but no difference was seen between the numbers of infections in different sized males. The throat was shown to have significantly more infections than other body region, and the legs had fewer infections than other regions. Images of the mite were collected using a scanning electron microscope and compared to drawings of previously described mites in order to determine the genus. A unique character was found in the mites, which excluded the genus of mite commonly known to infect frog in South America. This study is portion of Alan Brus's research honors project.

Oral Presentation O2.1

DETERMINANTS OF DOW JONES RETURNS

Cory Sloan and Elisabeta Pana*

Business Administration Department, Illinois Wesleyan University

As of 2010, there was \$14 trillion invested in the New York Stock Exchange (NYSE) and \$55 trillion invested in stock markets worldwide. In this study, we use the Arbitrage Pricing Theory (APT) to identify the main determinants of the Dow Jones returns for the period 1990-2011. We test several hypotheses on the relationship between index specific variables such as Dividend Yield, Earnings Yield, Book-Market and the index returns. We also document the relationship between several macroeconomic factors including T-bill rate, Default Spread, Term Spread, Unemployment and Inflation and index returns. Our results indicate a significant relationship between Earnings Yield, Unemployment, Inflation, Term Spread, T-bill rate and the index returns.

Oral Presentation O2.2

THE FINANCE BEHIND CONFERENCE REALIGNMENT

Brian Piotrowski and Elisabeta Pana*

Business Administration Department, Illinois Wesleyan University

The landscape of college sports, specifically football, has been changing due to the rapid pace of conference realignment among schools in the “Big Six” conferences. In this study, we identify the main determinants of the decision to switch conferences and assess the immediate financial impact triggered by such a decision. Using hand-collected data on Division 1 college football for the period of 2002-2011, we investigate the role played by school-specific and economic factors on conference realignment.

Oral Presentation O2.3

NATURE VERSUS NURTURE: SEXUAL ORIENTATION

Mackenzie Astling, Tim Reardanz and Darryl Brown*
Business Administration, Illinois Wesleyan University

Some people believe that sexual orientation is an occurrence that is linked to the genes, while others believe that it is based on the environment (Nature versus Nurture). This literature review uses a compilation of studies and reviews to show that sexual orientation is not determined solely by Nature or solely by Nurture. Along with scientific evidence to support this theory, there is a background on the history of the Nature versus Nurture model. Also included, is a brief history on different representations of sexual orientation throughout history. First introduced are sources that have a result that suggest that sexual orientation is biologically determined, and then there are sources that link exposure to certain experiences to sexual orientation. Both theories are feasible in situations that are independent from each other and neither can be ruled out completely.

Oral Presentation O3.1

**FRONTAL MIDLINE THETA AS AN INDEX OF EMOTIONAL MODULATION
IN WORKING MEMORY**

Sean O'Bryan and Joseph Williams*
Psychology Department, Illinois Wesleyan University

While the influence of emotion on long-term memory processes is well-understood, it remains unclear whether the presence of emotional information improves or diminishes working memory (WM) performance. Emotional stimuli may in fact enhance WM by activating attentional systems in the brain. Electrophysiological investigations have determined that brain areas associated with memory and emotion interact via a phenomenon known as the theta rhythm. As a common correlate of both WM and emotional processing in the frontal lobe, the theta rhythm may serve as a promising neurophysiological link between these cognitive processes. The present study utilized a WM task with dot arrays while electrical activity in the brain was recorded with an electroencephalograph (EEG). Face stimuli (positive, negative, and neutral affective faces) were incorporated throughout the memory task to determine the effects of emotion on both the theta rhythm and working memory performance.

Oral Presentation O3.2

**TYPE 1 DIABETES AND ITS EFFECTS ON ACTIVE/INACTIVE GOAL PRIMING
FOR EXERCISE**

Kevin Seske and Dr. Jason Themanson*
Psychology Department, Illinois Wesleyan University

This study determines whether priming (active or inactive) for exercise can be influenced by a chronic disease such as type 1 diabetes. Results were analyzed using a 2x2 between-subjects ANOVA to examine the influences of goal priming and a hypothetical chronic illness (type 1 diabetes) on the participant's intention to engage in active/inactive behaviors. Participants who were actively primed remained active even after the hypothetical diabetes diagnosis. Additionally, for participants that were inactively primed and given type 1 diabetes increased their active behavior outcomes/choices relative to those participants who were not given type 1 diabetes after being inactively primed. The results of this particular study may lead us to encourage kids to engage in an active lifestyle early that will carry over to their future lifestyle which may or may not include a chronic illness. Therefore, the chronic illness will not severely impact these active behaviors to stay healthy.

Oral Presentation O3.3

**THE HISTORICAL ANTECEDENTS OF POSITIVE PSYCHOLOGY:
A SCIENTIFIC PERSPECTIVE**

Daniel Maurer and Brad Sheese*

Psychology Department, Illinois Wesleyan University

This research project seeks to trace the historical antecedents that gave rise to positive psychology in modern times. Of special note will be existentialism, humanistic psychology, and how these two contributed to the ideological and scientific nature of the field. How positive psychology differs from popular psychology and positive theology through its use of the empirical method will be investigated in light of the field's unique past.

Focusing on human strengths, positive subjective experiences, and enabling institutions, positive psychology endeavors to provide empirical evidence regarding what goes right in life. Being a phenomenological approach to studying the mind and human behavior, positive psychology attempts to provide insights into psychological well-being and how such a state can be achieved. Adaptive ways of functioning are studied through evidence-based research, which is a hallmark of the field.

Oral Presentation O3.4

**AN ADAPTED METHOD FOR MEASURING GAS EXCHANGE
ACROSS AVIAN EGGSHELLS**

Sarah Takushi and Given Harper* and William Jaeckle*
Biology Department, Illinois Wesleyan University

Gas exchange through the pores of bird eggshells is necessary for normal embryonic development. Differences in eggshell porosity are known to influence rates of development and incubation periods. Eggshell porosity may vary among different eggshell regions within and among species. Portugal et al. (2010) glued eggshell fragments from domestic fowl to small tubes that contained water. These were placed in a dessicator and gas flow through the eggshells was measured as a decrease in tube weight. I tested this method to determine if it could be used to measure gas exchange through songbird eggshells. My findings indicated that the results reported by Portugal et al. (2010) were inaccurate and that gas loss may have been the result of an error in experimental technique (i.e., gas likely leaked around the seal of the eggshell). I have modified and tested this protocol to increase the accuracy and precision of the estimated rates of gas exchange through eggshell pores.

Oral Presentation O4.1

**ECONOMICS OF SALARY DISPERSION IN THE NATIONAL
BASKETBALL ASSOCIATION**

Dan Schouten and Michael Seeborg*
Economics Department, Illinois Wesleyan University

The purpose of this study is to discover the optimal amount of salary dispersion for an NBA team and the affect that dispersion has on team wins and revenue. The optimal amount of salary dispersion could be different for teams that want to maximize wins and teams that want to maximize revenue. For the purpose of this study, five different measures of salary dispersion are utilized to most effectively understand the effects. Empirical models are constructed and OLS regressions employed using cross-sectional data from the 2006-07 NBA season through the 2010-11 season to understand the relationship. The empirical evidence supports the idea that the larger the salary dispersion the greater the number of wins achieved. The evidence also implies that the amount of dispersion does not significantly affect the amount of revenue generated by a team. According to this study, a win maximizing team should attempt to hire as many superstars as possible given the NBA's salary constraints.

Oral Presentation O4.2

**DIAMONDS ARE FOREVER: BOTSWANA'S FIGHT AGAINST
THE RESOURCE CURSE**

Meara Dibadj and Michael Seeborg*
Economics Department, Illinois Wesleyan University

Botswana has often been hailed as the “Jewel of Africa,” due to its abundance of diamonds and developmental success. Botswana’s remarkable success is unique since most resource rich countries have retarded economic development. This retarded development is known in economics as the resource curse. Discovering why Botswana has managed to escape the resource curse is the purpose of my research. I use World Bank data to compare Botswana to its neighbors in southern African, including countries both with and without natural resource abundances. The results show that Botswana has generally experienced a higher standard of living than its neighbors and has had a less corrupt and more efficient government. These results suggest that by combating corruption and having an efficient government, Botswana has been able to escape the resource curse, and has become a possible model for development for other resource rich countries.

Oral Presentation O4.3

**A TIME-SERIES ANALYSIS OF UNEMPLOYMENT FOR THE ROCKFORD
METROPOLITAN AREA SINCE 1990**

Kent Larson and Diego Mendez-Carbajo
Economics Department, Illinois Wesleyan University

In recent years unemployment rates in the Rockford, Illinois, metropolitan area have changed in long term trend. We will explore the time series properties of the unemployment rate for the Rockford area using monthly data from January 1990 through November of 2011. The data was retrieved from the Bureau of Labor Statistics totaling 263 observation points. After seasonally adjusting the series and estimating its linear trend we determine its order of integration through the ADF and KPSS tests. Next, we induce stationarity by computing the first-order differences of their logarithmic values and proceed to identify the best-fitting ARMA(p,q) structure using the Box-Jenkins methodology. Finally, we conduct short-term dynamic and static forecasting.

Oral Presentation O4.4

**A TIME-SERIES ANALYSIS OF UNEMPLOYMENT IN COOK COUNTY
AND THE U.S.**

Taylor Kaldahl and Diego Mendez-Carbajo
Economics Department, Illinois Wesleyan University

Over the last twenty years Unemployment in Cook County has been higher than the national average. This paper conducts a time-series analysis of the unemployment rate in Cook County in order to determine if a new trend has developed. Data was obtained from the Bureau of Labor Statistics in monthly observations over the last twenty years. The data were seasonally adjusted and two linear trends were fitted in order to capture a change in their long-term behavior. The first trend line displays a slowly increasing rate of unemployment; the second trend line indicates a much faster rate of growth. These findings suggest that Cook County has experienced a structural change in recent years, resulting in rapidly increasing unemployment.

Oral Presentation O5.1

**TIME-SERIES ANALYSIS OF RECENT EMPLOYMENT STATISTICS IN THE
CHAMPAIGN-URBANA METROPOLITAN AREA**

Patrick Dahl and Diego Mendez-Carbajo*
Economics Department, Illinois Wesleyan University

This research studies employment trends in the Champaign-Urbana metropolitan area. The 2007-2009 recession has made a better understanding of employment statistics a priority. This study focuses on, the number of employed citizens in the area. Monthly data beginning in January 1990 and ending in November 2011, was collected by the Bureau of Labor Statistics. We apply time-series analysis techniques including the seasonal adjustment of the data and the fitting of linear, long-term, trends. Preliminary analysis reveals that the rate of change of growth in employment figures between 1990 and 1995 was, on average, -0.2164 % and that during the remainder of the sample period employment grew at a rate of 0.7207 %. We also estimate an auto-regressive and moving-average (ARMA) model. This model allows us to forecast future employment figures as a function of previous values in the series.

Oral Presentation O5.2

**TIME SERIES ANALYSIS OF THE UNEMPLOYMENT RATE IN
KANKAKEE COUNTY, ILLINOIS**

Cameron Ohlendorf and Diego Mendez-Carbajo
Economics Department, Illinois Wesleyan University

During the past two decades, Kankakee County, Illinois, has seen its unemployment rate rise and fall with the national average. However, following the recent financial crisis, Kankakee County has seen an increase in the unemployment rate well above the national average. This study explores the time-series analysis qualities of Kankakee's unemployment rate trend. By analyzing the relationships between the Kankakee County unemployment rate and the United States national unemployment rate, we hope to provide insight into what may be causing this divergence. This study employs unemployment rate data collected monthly between January 1990 and December 2011 by the Bureau of Labor Statistics totaling 270 observations. We establish the presence of unit roots in the data and induce stationarity by computing the first-order differences of their logarithmic values. The best-fitting autoregressive and moving average (ARMA) structure is determined by using the Box-Jenkins methodology. Finally, we perform short-term forecasting.

Oral Presentation O5.3

A TIME-SERIES ANALYSIS OF TWO DECADES IN PEORIA'S LABOR MARKET

Nick Kenaga and Diego Mendez-Carbajo*
Economics Department, Illinois Wesleyan University

Over the past few decades, the U.S. unemployment rate in the manufacturing industry has steadily increased, particularly during recessions. In the Peoria Metropolitan Statistical Area (MSA), an area with a relatively high proportion of the population employed in the manufacturing industry, this is a particular concern. This study focuses on the monthly unemployment rate in the Peoria MSA between 1992 and 2011, with data collected from the Bureau of Labor Statistics, and compares it to national levels both overall and in the manufacturing industry. This statistical analysis establishes the presence of seasonal patterns and linear trends in the data. It also determines the order of integration of the series in order to fit an auto-regressive and moving-average (ARMA) model. Finally, it performs static and dynamic forecasting to project the series into the short-term future.

Oral Presentation O5.4

A TIME-SERIES ANALYSIS OF EMPLOYMENT IN DANVILLE, ILLINOIS

Jonathan Bates and Diego Mendez-Carbajo*
Economics Department, Illinois Wesleyan University

This study analyzes employment in the Danville, Illinois metropolitan area from 1990 to 2011. Employment is measured as the number of people working for pay, including self-employed persons and persons holding jobs but not currently working for a number of reasons. A time-series analysis of employment reveals seasonal, cyclical, and long-term trends, which aids in understanding the past and present state of Danville's economy. Monthly data ranging from January 1990 through December 2011 was collected by and obtained from the United States Department of Labor's Bureau of Labor Statistics, totaling 264 observations. Over this time period, employment has decreased gradually from 38,607 to 32,746 persons. Seasonal patterns indicate that summer months typically have higher numbers of employed citizens than winter months. A moving average approximation suggests cyclical changes coincide with economic expansions and contractions.

Oral Presentation O6.1

MUSICAL PREDISPOSITION

Kaileen Cummings, Brandon Moore, Lauren Rupert and Darryl Brown*
Business Administration Department, Illinois Wesleyan University

The purpose of this research paper is to examine whether humans have a predisposition for musical ability by researching the development of sound production and comprehension in infants. Additionally, we examine whether or not musical talent is innate or learned by looking at special cases such as savants and musical prodigies. The position taken in this paper is that all humans have an innate predisposition to music, and that musical talent can then be cultivated from this predisposition. This paper is written in the hopes that it will encourage funding for the continued musical education of children across the country.

Oral Presentation O6.2

TRAUMATIC BRAIN INJURY AWARENESS: EDUCATIONAL TECHNIQUES

Katherine Racanelli and Victoria Folse
School of Nursing, Illinois Wesleyan University

The awareness of mild traumatic brain injury as a health concern has increased across a wide array of settings due to a plethora of research and clinical findings that indicate the serious threat concussions pose, particularly to young athletes. The need to provide risk reduction and health promotion education to athletes and parents necessitates an innovative approach. This study explores the effectiveness of an educational intervention based on information from the Centers for Disease Control and Prevention to promote awareness regarding the pathophysiology, symptoms, consequences, and prevention of sports-related mild traumatic brain injury. An interactive program was administered to student athletes, parents, coaches, and athletic trainers at three Bloomington-Normal high schools. Knowledge of the participants was evaluated prior to and following the intervention with a questionnaire to determine changes in comprehension and provide direction to design future programs that promote traumatic brain injury awareness.

Oral Presentation O6.3

**COMMUNITY HEALTHCARE CLINICS: AN ANSWER TO REDUCING MISUSE OF
EMERGENCY DEPARTMENT**

Kelly Cantlin and Lisabeth Searing*
School of Nursing, Illinois Wesleyan University

Roughly one-third of all emergency department (ED) visits by both insured and uninsured individuals in the U.S. are for non-urgent conditions that can be effectively treated at a reduced cost by a primary care provider. This study is a secondary data analysis of patient visits to two midwest community EDs. The purpose of this study is to identify trends of ED visits by uninsured individuals. Community healthcare clinics (CHC) and the available services could help minimize non-urgent ED visits and improve primary care access in communities. This study examines the services provided in the ED for non-urgent visits that could be provided at a less costly facility, such as a CHC. Implications of the analysis are discussed, including community resources needed to reduce non-emergency visits and the associated cost burdens of uncompensated healthcare dollars on these midwest communities.

Oral Presentation O7.1

THE FORGOTTEN ONES: POSITION OF THE CHILD IN ROMANIAN HISTORY

Sarah Moir and Marina Balina*
International Studies, Illinois Wesleyan University

Children are perhaps the world's most vulnerable population. In Romania particularly, children suffered from State-perpetrated neglect. Romania's rocky history and development of the educational system did not adequately consider the position of the child. The structure of the educational system, although evolving since the mid-18th century to be more inclusive, continued to exploit Romania's young. Public education was not common or compulsory until the mid-19th century, and by the 20th century, education was still largely inadequate. Under communism the system became much more inclusive, but shifted the focus of schooling away from academics. Alongside these changes in education, the structure of the family transformed from a large kin-based support structure to a nuclear family model that relied largely on institutional upbringing for children. This systematic neglect of vulnerable young citizens led to a devaluation and commodification of Romania's children.

Oral Presentation O7.2

**RUSSIA'S INTERNATIONAL ADOPTION POLICIES: REALITIES OF THE
SOVIET HAPPY CHILDHOOD MYTH**

Hannah Freeman and Marina Balina *
International Studies Department, Illinois Wesleyan University

The Myth of Happy Childhood: Russia's International Adoption Policies, focuses on dispelling the Soviet myth of happy childhood through revealing the numerous groups of children who were systematically left out of this upbringing. My presentation focuses in particular on the plight of orphans in the USSR and continues to follow their childhood experience through investigating the intercountry adoption policies between the U.S. and Russia. My research aims to dispel the laws and regulations that are currently in place within the Russian orphanages and adoption system through real life experience including personal interviews that were conducted with American parents of Russian adoptees.

Oral Presentation O7.3

**MAOISM IN SOUTH ASIA: A COMPARATIVE PERSPECTIVE ON IDEOLOGY,
PRACTICE, AND PROSPECTS FOR THE 21ST CENTURY**

Ryan Nielsen and Meghan Burke*
International Studies, Illinois Wesleyan University

The largely rural, peasant societies of India and Nepal—along with the relationship between India/Nepal and advanced capitalist countries—have resulted in similar domestic situations in both countries that are/were favorable to building revolutionary Maoist movements. The respective communist parties that are leading Maoist movements in India and Nepal have/had analyzed the domestic situations in each country to be semi-feudal and semi-colonial, thus drawing on the historical legacy of Maoism to lead revolutionary struggles. However, the unique particularities in both Nepal and India have presented complexities that have lead to ideological divergences and a contestation of Maoism and New Democracy as a means for making communist revolution.

Oral Presentation O8.1

**CHOICE, COERCION AND CONFLICT: LINGUISTIC HUMAN RIGHTS, CULTURAL
LIBERTY AND PEACEKEEPING IN A GLOBALIZED WORLD**

Megan Thompson and William Munro*

International Studies/Sociology, Illinois Wesleyan University

The development of English into an international lingua franca is not, as scholars have argued, an inevitable result of globalization. Instead, the “triumph” of English and the consequent decline of the world’s linguistic diversity cannot be viewed in isolation of the parallel history of conquest, violence, and exploitation. Today, the languages privileged by the powerful—not only English, but also other dominant and national languages, or standard varieties of those languages—are a prerequisite for mobility. This fact renders any discussion of language “choice” irrelevant—when a choice yields the fulfillment of basic human capabilities on one hand and the denial of those capabilities on the other, the issue becomes one not of choice, but of rights. Drawing on Amartya Sen’s work, this paper addresses these issues through the analysis of personal narratives of multilingual individuals, calling for an understanding of language as a right and resource for human development and conflict prevention.

Oral Presentation O8.2

**INTERNAL AND TRANSNATIONAL MEXICAN MIGRATION:
A MARXIAN APPROACH**

Alejandro H. Monzón and Meghan Burke*

Sociology and Anthropology Department, Illinois Wesleyan University

The internal and transnational migration of workers from the global south is an increasingly salient phenomenon that many scholars seek to explain. Karl Marx's indispensable work, *Capital: a Critique of Political Economy* provides a conceptual framework that can be applied to explain the phenomenon of migration and its consequences. In this exploratory work, I use Marxian concepts found in *Capital* to argue that migration of subsistence farmers within Mexico and from Mexico to the United States is a result of the primitive accumulation of capital as well as the need for a reserve army of labor for production. Examining Mexican migration through the Marxian lens exposes the inhumane social relations within capitalism.

Oral Presentation O8.3

**USING LEGAL INSTRUMENTS IN HUMAN RIGHTS ADVOCACY:
THE GUANGCHEN CHEN CASE**

Jeremy Duffee, Xinlin Xu and Cathy Geehan and William Munro*
Political Science Department, Illinois Wesleyan University

Through Scholars at Risk (SAR), a group of students and faculty advisors became involved in an advocacy project on behalf of Chinese human rights activist and lawyer, Guangcheng Chen. The Chinese government began investigating Chen after he released a report in 2005 that detailed forced abortion and sterilization procedures in his hometown province in compliance with the One Child Policy. As a result of his work, he spent time in prison and is currently being held under house arrest. The conditions of his detention and the political nature of his arrest violate the rights of citizenship and the right of freedom of association and freedom of expression laid out in the Chinese legal code. Chen's arrest and subsequent treatment also violate the rights enumerated in various international legal instruments such as the Universal Declaration of Human Rights and the International Covenant on Civil and Political Rights. Though these documents are not legally binding upon the Chinese state, they do create an international moral pressure that China conform to norms concerning human rights. The presentation will outline the difficulties of internationally prosecuting the violators of such rights in systems that emphasize sovereignty and national security over human rights. Advocating for the norm of human rights in a system based on the norm of sovereignty involves a complex navigation of both legal documents and political exigencies. The legal advocacy portion of the SAR project is intended to culminate in a presentation to the Human Rights Committee of the Chicago Bar Association.

Oral Presentation O8.4

**BUILDING A CASE FOR HUMAN RIGHTS ADVOCACY:
THE GUANGCHENG CHEN CASE**

Elizabeth Liubicich, Kelsey “Rae” Brattin, and William Munro*
Political Science Department, Illinois Wesleyan University

A group of students and faculty members at Illinois Wesleyan University have undertaken an advocacy project in cooperation with Scholars at Risk, an institution dedicated to “promoting academic freedom and defending the human rights of scholars worldwide.”¹ Illinois Wesleyan’s chosen scholar is Guangcheng Chen, a self-educated, Chinese human rights lawyer. Chen received national recognition after his publication of a 2005 report detailing forced abortions and sterilizations in the Shandong Province of China. Chen was subsequently arrested for organizing a mob to disrupt traffic, charges of suspicious legitimacy, and is now detained in house arrest even after the completion of his formal sentence. The aim of Illinois Wesleyan’s project is to bring attention to the violations of human rights toward Chen and his family while advocating for a national stance against his unlawful detention. This presentation will include our findings on the background and timeline of Chen’s specific charges, trial, and incarceration and the violations of human rights we believe were committed in each of these areas. Also included will be examples of our research methods and challenges of finding authoritative sources, the use of international and legal instruments to build an advocacy case for Chen. Discussion of our allies at Scholars at Risk, Human Rights in China, and Dui Hua will be included along with the progress and direction Illinois Wesleyan intends for the project to take.

¹ Scholars at Risk Network. Web. 23 Mar. 2012. <<http://scholarsatrisk.nyu.edu/>>.

Oral Presentation O9.1

**A RISK MEASUREMENT OF CATERPILLAR STOCK SINCE
THE 2008 FINANCIAL RECESSION**

Samuel Mitchell, Julie Klink, Onyinye Udenze, Kent Larson
and Jeungbo Shim*

Business Administration Department, Illinois Wesleyan University

Risk measurement has been a challenging and important task for all companies in recent years. Value at Risk (VaR) is probably the most widely used risk measure. Management and shareholders easily understand the risk level since VaR captures a firm's portfolio risks in a single number. Organizations have used different methods to estimate the maximum possible loss (VaR) at a given time period. The variance-covariance method assumes that asset returns are normally distributed. Historical simulation method is suggested to overcome this distributional assumption. Historical simulation method preserves any "heavy-tailed" properties since variance and co-variances of key risk factors are implicitly included. We measure the amount of risk that investors are exposed to from investing in Caterpillar stock during the recent financial crisis. We also compare the performance of risk measurement between these two methods.

Oral Presentation O9.2

MACROECONOMIC DETERMINANTS OF GOLD INDUSTRY STOCK RETURNS

Michael Chau and Jeungbo Shim*

Business Administration Department, Illinois Wesleyan University

Over the past 12 years, the gold bullion continues to become a significant investment. Financial advisors and analysts have recommended investors invest a small portion of their portfolio into the precious metal commodity asset. Gold mining stocks offer investors the ability to leverage the volatile but rising gold prices. The expected relationship between gold price and gold stock returns is that for every 1% increase in gold prices, gold stocks can be expected to gain 2-3%. Building on a multifactor model by Faff and Chan (1998), we examine how macroeconomic factors such as market returns, foreign exchange rate, and interest rate affect the U.S. gold industry stock returns over the period 1996-2011. We contribute to the literature by exploring the significance of business cycle in explaining gold stock returns.

Oral Presentation O9.3

**U.S – CHINA TRADE AND ITS EFFECTS ON
U.S. MANUFACTURING EMPLOYMENT**

Tung Hoang and Michael Seeborg*
Economics Department, Illinois Wesleyan University

The pattern of trade between the United States and China has changed dramatically over the past 20 years, witnessing a substantial growth in both U.S. exports to and imports from China. The purpose of this study is to assess whether U.S. – China trade in manufacturing sector has an impact on U.S. manufacturing industries after controlling changes in economic environment. By analyzing the trade patterns during the period of 1989 – 2010 using OLS regressions, we can see how the U.S trade balance, and imports and exports with China affect employment of 21 U.S manufacturing industries. The findings of this study confirm that changes in U.S manufacturing employment can be attributed to the trade patterns between the United States and China over the past 20 years for most manufacturing industries.

Oral Presentation O9.4

ECONOMIC ASSIMILATION OF CHINESE IMMIGRANTS IN THE UNITED STATES: IS THERE WAGE CONVERGENCE WITH NATIVES?

Yujie (Eunis) Wu and Michael Seeborg*
Economics Department, Illinois Wesleyan University

Asian Americans are usually referred to as the “model minority” due to perceptions of their high income and educational attainment; yet relatively little is known about their economic assimilation experience. The purpose of this study is to determine economic assimilation of Chinese immigrants over time. This research follows a cohort of Chinese immigrants from 1994 to 2011 and compares their earnings performance with natives that have similar educational attainment. Multiple regression analysis is used to analyze data from the Current Population Survey. Results show that, although the cohort of Chinese immigrants initially has earnings substantially lower than the natives, it is only about 10 years before they reach income parity. By 2011 Chinese immigrants’ earnings exceed natives’ by about 4 percent. The study concludes that despite the language and adjustment challenges, Chinese immigrants do show relatively rapid economic assimilation in the United States.

Oral Presentation O10.1

DUALIZING CAMUS WITH OPTIMIZATIONS

Ammar Malik and Mark Liffiton*

Computer Science Department, Illinois Wesleyan University

CAMUS is a tool utilizing Professor Liffiton's research in analyzing infeasible constraint systems to find Minimally Unsatisfiable Subsets (MUSes) of unsatisfiable Boolean problems. In particular, it uses the correlation between Maximally Satisfiable Subsets (MSSes) and MUSes to obtain MUSes which are irreducible hitting sets of the complement of MSSes.

We implement a new algorithm that traverses the search space in a manner dual to that implemented in CAMUS. While CAMUS starts with the problem set and removes elements to find the solution subsets, our algorithm starts with the empty set and includes elements to reach these same subsets. CAMUS uses various optimizations, some of which we include and modify where necessary for the dual problem. Finally, we move on to a hybrid approach where we combine both ways. This allows us to find MUSes from any subset of the problem by excluding/including elements based on the satisfiability of the subset.

Oral Presentation O10.2

COUNTEREXAMPLE GENERALIZATION IN A DUAL ALGORITHM OF CAMUS

Edward Thome and Mark Liffiton*

Computer Science Department, Illinois Wesleyan University

The unsatisfiability of a particular Boolean formula, which can be considered a set of constraints, can be explained by its minimal unsatisfiable subsets (MUSes). My research involves a new dual algorithm to the previous CAMUS for computing the MUSes of unsatisfiable Boolean formulas, subsets that cannot be reduced any further without becoming satisfiable. The dual algorithm generates MUSes from an abstraction of a formulation of unsatisfiable subsets of constraints. As counterexamples to the abstraction, or models of non-MUS subsets, are discovered, the abstraction is refined by blocking these non-MUSes and their subsets. A counterexample can be generalized by adding further constraints to the subset represented by the model, allowing for a greater refinement of the abstraction, and possibly improving the runtime of the algorithm. I present different heuristics for counterexample generalization that I developed, programmed, and tested, comparing their impact on the runtime of the dual algorithm.

Oral Presentation O10.3

**NATIVE CARDINALITY CONSTRAINTS: MORE EXPRESSIVE,
MORE EFFICIENT CONSTRAINTS**

Jordyn C. Maglalang and Mark Liffiton*

Computer Science Department, Illinois Wesleyan University

Boolean cardinality constraints are commonly translated (encoded) into Boolean CNF clauses, a standard form of Boolean satisfiability, which can be solved using a standard SAT solving program. However, cardinality constraints are a simple generalization of clauses, and the complexity entailed by encoding them into CNF can be avoided by reasoning about cardinality constraints *natively* within a SAT solver. In this work, we compare the performance of two forms of native cardinality constraints against some of the best performing encodings from the literature. We designed a number of cardinality constraints including crafted, random and application problems, to be run in parallel on a cluster of computers. Native implementations substantially outperform CNF encodings on instances composed entirely of cardinality constraints, and instances that are mostly clauses with few cardinality constraints exhibit mixed results warranting further study.

Oral Presentation O11.1

ELECTRICITY: A CURSED RESOURCE?

Devin Long and Michael Seeborg* and Craig Broadbent*
Economics Department, Illinois Wesleyan University

The natural resource curse is a widely documented hypothesis that attempts to explain why countries that receive large oil and mineral revenues often fail to better the lives of their citizens, often lowering standard of living. This study looks to examine the effects of electricity exports on quality of life in Africa. This project data from the World Bank, the United Nations Development Programme, and the CIA World Factbook to examine twenty-five countries from 2005-2008, providing one hundred observations. OLS regression results show that electricity exports in Africa significantly increase levels of corruption, and that the increase in corruption negatively affects standard of living, supporting the project's hypothesis that electricity exports are the source of a natural resource curse in Africa.

Oral Presentation O11.2

**FINANCIAL AND LABOR MARKET DETERMINANTS OF MORTGAGE
DELINQUENCY RATES: MCLEAN COUNTY, IL, 1985-2011**

Jake Mann and Diego Mendez-Carbajo*
Economics, Illinois Wesleyan University

This study examines the relationship between labor and financial market factors and the mortgage delinquency rate in McLean County, Illinois, between January 1985 and December 2011. The mortgage delinquency rate is defined as the ratio between the number of defaulting mortgages and the number of mortgages issued. The volume of defaulting mortgages is measured through the number of *lis pendens* notices filed with the Recorder's Office. A *lis pendens* notice informs the grantee of a mortgage loan that the grantor's payments are three months overdue. The issuance of this notice starts a foreclosure process. As labor market indicators we consider the number of both employed and unemployed workers, as well as the unemployment rate. As financial market indicators we consider region-specific and national-level interest rates in both fixed (30-year) and variable (1-year adjustable) forms. We employ Ordinary Least Squares regression to model countywide mortgage delinquency activity. Our findings indicate that the delinquency rate is positively related to the volume of unemployed workers in the county and more strongly, to mortgage interest rates.

Oral Presentation O11.3

**THE IMPACTS ON JAPANESE AUTOMOBILE EXPORTS TO
THE UNITED STATES**

Ryo Sakamoto and Ilaria Ossella-Durbal*
Economics Department, Illinois Wesleyan University

The United States is the largest foreign market for Japanese automobile makers and was growing in the United States market rapidly after World War II. However, Japanese automobiles makers are having hard times in the past few years because of some recent events, such as continuous yen appreciation, Toyota Recall and the recession in the United States. Maintaining specific amount of production in Japan is an important issue for Japanese car makers because they want to keep the employment in Japan. Therefore, how automobile exports to the United States are affected by shocks is important for Japanese car makers and for Japan itself. This research focuses on finding how both demand and supply shocks are affecting automobile export to the United States by using empirical analysis.

Oral Presentation O11.4

**META-ANALYSIS OF ENVIRONMENTAL KUZNETS CURVE STUDIES:
DETERMINING THE CAUSE OF THE CURVES PRESENCE**

Brittany Goldman and Craig Broadbent*
Economics Department, Illinois Wesleyan University

This investigation uses meta-analysis to explore the systematic variation across Environmental Kuznets Curve (EKC) studies to better understand the specific factors that affect the relationship between economic growth and environmental quality. Meta-analysis is the statistical synthesis of data from a set of comparable studies of a problem yielding a quantitative summary of pooled results. Following the findings of Li et al. (2007), a multinomial logit model is employed to analyze 929 observations from 120 different studies published between 1992 and 2012. Results indicate that seven variables (sulfur dioxide, number of observations, emission, global factor, time, level of development, and publication date) significantly affect the presence of the EKC. There is not statistically significant evidence showing increased or decreased probability of finding an EKC from carbon dioxide, nitrogen oxide, GDP measures, pollution activity source, or panel data.

Oral Presentation O12.1

**THE LATINO IMMIGRANT EXPERIENCE: AN INTERDISCIPLINARY REVIEW OF
THE OUTCOMES OF HISTORICAL AND CURRENT INSTITUTIONALIZED
INEQUALITIES**

Erin Howes and Sumer Seiki*

Educational Studies Department, Illinois Wesleyan University

The United States is regarded as a country founded and formed on the basis of immigration and cultural diversity. The recent surge of Latino immigration has been one of the largest in the country's history, yet has this immigrant group has experienced some of the most detrimental effects. This literature uses both qualitative and quantitative research in sociology, psychology, and economics to gain further understanding of the strong intersectionality of the Mexican immigrant identity, the deeply rooted inequalities and institutionalized prejudices in the United States both historically and currently, and how the United States is affected by the presence of documented and undocumented Latino immigrants. My findings suggest that the Latino immigrant population is burdened by assimilatory pressures and xenophobic relations that have led to personal hardships relating to language, identity, and familial customs and public sectors in the labor force, educational systems, and political decision-making.

Oral Presentation O12.2

**HEROINES OR REPRESSED WOMEN:
AN EXAMINATION OF THE OPPRESSION, LIBERATION, AND DEVELOPMENT
OF ALGERIAN WOMEN FROM THE 1950S TO THE PRESENT DAY**

Caroline Rohloff and Scott Sheridan*
French and Francophone Studies, Illinois Wesleyan University

Since the Algerian war for independence against the French in the 1950s, the roles of Algerian women have been shifting over the past five decades. During the war for independence, women found themselves in positions of power, where their military assistance was necessary to win the war. However, once independence was gained in 1962, women were once again forced into the predetermined roles of wives and mothers. Over the next four decades, the situation in Algeria began to improve as the educational and work opportunities for women increased. After a setback in the 1990s, during Algeria's civil war, Algerian women have continued to make advances in society and are embracing the liberties that accompany a modernizing state. This study examines the development of women's societal positions in Algeria and the different roles that women have played during important events in Algeria's history. Through the application of the feminist theory and through the use of film, this study assesses the obstacles that Algerian women have faced in their efforts to gain liberation and respect.

Oral Presentation O12.3

LEVIN'S HAPPINESS AS TOLSTOY'S MODEL FOR LIFE

Rachel Branson and Marina Balina*

Modern and Classical Languages and Literature Department, Illinois Wesleyan University

This presentation will examine the distinct didactic role of the Constantine Levin character in Leo Tolstoy's novel *Anna Karenina*. Through Tolstoy's own views on the purpose of art – that an artist should unreservedly relive his or her own experience for the sake of an audience's vicarious experience – he created a protagonist of such a compelling imitation of humanity that Levin lives beyond the pages of the novel. As such, Levin's educational role is unique. Tolstoy does not advocate that Levin's life is to be emulated by the reader, but rather that it should serve as a cause to reexamine our own lives by means of the common human experiences which Tolstoy so deftly illustrates in *Anna Karenina*. Examining Tolstoy's purpose for Levin primarily through Gary Saul Morson's theory of "prosaics" and Levin's own weaknesses in coping with everyday life occurrences, the author's own conflicts are revealed, allowing the reader to more fully experience the power of Tolstoy's message.

Oral Presentation O12.4

DANCE MUSIC AND THE *CANTIGAS DE SANTA MARIA*

Chelsey Belt and Adriana Ponce*
School of Music, Illinois Wesleyan University

The *Cantigas de Santa Maria* are a Spanish Medieval collection of songs to the Virgin Mary. The manuscripts originated at the Castilian court of Alfonso X (called *el sabio* or “the wise”), who ruled Castile and Leon from 1252 until 1284. Alfonso compiled the songs between 1257 and 1283 after what was deemed a miraculous recovery from sickness. These manuscripts have become a valuable source for Medieval musicology, as it is one of the only sources of notated secular music from the period. The dance music of the Middle Ages was another important secular tradition which permeated all levels of Medieval life, including the church, the court, and the working class. The lyric and music of the *Cantigas* display many of the same societal elements that were impacted by dance. This paper explores the implications of the Medieval dance tradition on the music of the *Cantigas de Santa Maria*.

Oral Presentation O13.1

RURAL QUEEN: A COLLECTION OF POEMS BY AMANDA WILLIAMS

Amanda Williams and Joanne Diaz*

Department of English, Illinois Wesleyan University

This collection examines and explores the landscape, people, and culture of life in rural Southern Illinois. In my poems, I explore the themes of nature, manual labor, rural stereotypes, patriotism, and eroticism; in my preface, I discuss the difficulties involved in portraying these themes with an attention to authenticity, and I explain how I came to my understanding of what is “authentic” in the context of crafting poems. I draw inspiration from American poets Walt Whitman, Brian Turner, Edgar Lee Masters, and e.e. cummings, whose work offered insight into my poetic discussions of landscape, nature, the struggles associated with rural life, and the use of specific diction. I discuss the Early Modern poets that informed some of my formal explorations in the collection, particularly my allusion to the sonnet form, and I discuss the ways in which John Donne’s erotic verse guided my exploration of the metaphysical and visceral manifestations of love and lust in my poems. I also discuss the use of portraiture in my collection, and the ways in which I develop specific characters that exist in the landscape I create. The 29 poems in the collection, many guided by a first-person narrative voice, take the reader through experiences of work, loss, love, and a deep reverence for the idiosyncrasies of a rural life.

Oral Presentation O13.2

**A SCHEMA-THEORETIC APPROACH TO AGREEMENT AND DISAGREEMENT IN
LITERARY INTERPRETATION**

Amy Fairgrieve and Wes Chapman*
English Department, Illinois Wesleyan University

In this paper I undertake explain how we come to agree or disagree about interpretations of literary texts. The foundation for my argument is schema theory, a cognitive theory of memory structure, which I use to demonstrate how each of us develops an overall interpretation of a given story or poem. I consider how schema content is formed through cultural and individual experiences, then suggest several patterns of schema usage that occur as we read and lead to a unique interpretation. Finally, I discuss how schematic learning experienced when we discuss literature with others affects whether we agree or disagree with them. In order to support this argument, I draw from my own empirical research, consisting of undergraduate English students reading and responding to a set poem. I also draw from important figures in cognitive theory such as David Rumelhart, Mark Turner, Gilles Fauconnier, and Patrick Colm Hogan.

Oral Presentation O13.3

WATER BURIAL

Korey Williams and Pamela Muirhead*
English Department, Illinois Wesleyan University

Water Burial is an extended multi-genre meditation on the energies that fuel and guide my living. Using poetry, drama, and prose, I tussle with the multiplicity of my identity—the interconnection of race, gender, class, religion, and sexuality—grappling to understand my queer Black experience. *Water Burial* is also my mode for addressing the sociopolitical dilemma challenging nearly all LGBT people of color, specifically Black queer people (i.e. heterosexism and homophobia within the Black community as well as racism in the white gay community). The process of composing *Water Burial* involved extensive reading in Black queer theory (Marlon B. Ross, Charles I. Nero, E. Patrick Johnson, Evelyn Hammonds, Laura Alexandra Harris, etc.) as well as Black queer literature (Cheryl Clarke, Audre Lorde, Sapphire, Carl Phillips, Reginald Shepherd, and *many* others). *Water Burial* is truly an interdisciplinary undertaking, integrating literary theory, cultural studies, and personal narrative in a creative writing context.

Oral Presentation O13.4

THY FATHER AND THY MOTHER: A COLLECTION OF POETRY

Natalie Lalagos and Michael Theune*
English Department, Illinois Wesleyan University

Thy Father and Thy Mother is a collection of poetry that explores personal family difficulties. Although family is a unifying theme throughout the collection, the poems reveal various thoughts and perspectives on the situation. The collection's critical preface explores the ways in which the writing of a unified manuscript allows for a microscopic focus in each poem. This focus created an opportunity to make connections between the past and the present that had not previously been made. Additionally, this project explores the ways in which poetry can serve as a vehicle for understanding the past, and is a manifestation of the ability of poetry to transform sadness into art.

POSTER SESSION A

9:00 - 10:00 a.m.

Odd-Numbered Posters

POSTER SESSION B

2:35 – 3:35 p.m.

Even-Numbered Posters

EDUCATIONAL STUDIES POSTERS - ES

9:00 – 10:00 a.m.

or

11:00 – 12:00 noon

Lower Level – Ames Library

Note: Student's name is underlined, faculty advisor designated with *

During each poster session the author will be present to discuss her or his research with conference attendees, and answer questions.

Please remove your posters from CNS Atrium by 4:00 p.m.

Poster Presentation P1

SERIAL KILLERS

Brooke Alba, Natalie Witter, Lizabeth Kaeb, Alison Novakow, and Dr. Daryll Brown*
Business Administration Department, Illinois Wesleyan University

We chose to research and study the effects of nature and nurture on serial killers. In our paper we used numerous examples of serial killers, such as Jeffrey Dahmer and John Wayne Gacy, to add credibility to our research. We researched their childhoods extensively and found ideas that prove both the nature and nurture side of the argument. We found many commonalities in the childhoods of the to-be serial killers, and we believe these commonalities to be a big factor in determining who they were. We also read numerous articles written by professionals on this subject. These articles also provided evidence to support both nature and nurture. After reading numerous sources and giving much thought to the subject, we, as a group, came to the conclusion that nurture is more significant in determining whether or not one will become a serial killer. We can use these results to inform society on how to prevent the dangers that can happen from their actions.

Poster Presentation P2

ALCOHOLISM

Cydnee Mann, Ali Stevenson, and Darryl Brown*
Business Administration Department, Illinois Wesleyan University

Is alcoholism an addiction that we are born with (nature), or something that we learn and acquire from our surroundings (nurture), or both? The answer to this question is important both in terms of treatment programs and a general understanding of the effects of alcohol consumption. If nature plays a larger role than nurture, early identification might prevent problems later in life for some individuals. For example, if an individual has a predisposition for alcohol addiction, knowing this fact could help the individual avoid excessive drinking, or drinking altogether. Our analysis takes the position that alcoholism is *not* a disease but an ailment similar to other addictions. Our results indicate that both nature and nurture play a significant role in alcohol addiction.

Poster Presentation P3

**GENOME ANNOTATION OF A C1 MYCOBACTERIOPHAGE ISOLATED FROM
CENTRAL ILLINOIS SOIL**

Catlin Arrington, Elyse Borchik, Ethan Gelke, Ryan Holden, Sam Sorenson, Brenden Wall,
Da Wang, Anthony Bohner, Julie Anne Canter, Drew Cullet, Crystal Diaz, Kati Forman,
Munia Mustafa, Lauren Awdziejczyk, Stephen Whitfield, and David Bollivar* and Loni Walker*

Biology Department, Illinois Wesleyan University

In order to contribute more information on the genomic structure of mycobacteriophage, fifteen distinct phages were isolated from soil samples. The DNA of one phage, Shrimp, was sequenced at the University of Pittsburgh and analyzed with the computer programs DNA Master, HHpred, Phamerator, Glimmer, and GeneMark. These programs were crucial in the characterization process to analyze the coding sequence, gene number, and protein function(s). Through the characterization of Shrimp's 155,714 base pairs and 235 genes, the genome showed a close resemblance to the C1 cluster. However, the functions of many genes within Shrimp's genome have yet to be identified. The complete annotation of the genome will be submitted to the GenBank database.

Poster Presentation P4

MATERNAL INVESTMENT IN *PHYSA ACUTA*

Lauren Awdziejczyk and William Jaeckle*

Biology Department, Illinois Wesleyan University

In oviparous reproduction there is a proposed relationship between maternal resources allocated to each egg and offspring viability. This balance between producing a viable next generation without over-expending personal resources has been previously studied in amphibians and sea urchin species. The freshwater snail *Physa acuta* continuously lays clutches of 5 to 50 eggs every 12 to 24 hours. Comparisons of egg capsules (n=375) laid by four individuals over the span of one week revealed that there was little variation in every capsule volume and clutch size among eggs laid by any individual. There were differences between capsule and clutch size among individuals, however I was unable to detect correlations between individual capsular volume, or total capsular volume produced over a defined time frame, and maternal size. Differences in capsule volume predict differences in maternal investment. In order to evaluate the effects of the observed differences in maternal investment on offspring viability and size I removed different volumes of intracapsular fluid from selected egg capsules and observed the effects on the resulting juvenile. If there was no trade off between parental investment and juvenile viability, then we would expect mothers to contribute to each egg the minimum amount of nutrients required for the juvenile to survive and hatch. In *Physa acuta* capsular volume could be decreased to less than 40% of its original size and still result in viable juvenile. These manipulated hatchlings were on average smaller than their unaltered siblings. This suggests that there is an evolutionary fitness benefit to producing offspring larger than the minimum size necessary for survival.

Poster Presentation P5

**THE ISOLATION AND CHARACTERIZATION OF NOVEL BACTERIOPHAGES
FROM CENTRAL ILLINOIS**

Anthony Bohner, Julie Anne Canter, Drew Cullet, Crystal Diaz, Kati Forman, Munia Mustafa, Catlin Arrington, Elyse Borchik, Ethan Gelke, Ryan Holden, Sam Sorenson, Brenden Wall, Da Wang, Lauren Awdziejczyk, Stephen Whitfield, and David Bollivar* and Loni Walker*

Biology Department, Illinois Wesleyan University

Members of the Illinois Wesleyan University General Biology Science Education Alliance (SEA) laboratory isolated and characterized a number of distinctive mycobacteriophages. Each student collected soil samples from the central Illinois area then used streak assays and titrations to isolate unique phages that infect *Mycobacterium smegmatis*. Transmission electron microscopy (TEM) and DNA restriction enzyme digests were used to determine the morphology and tentative cluster placement of each phage. By the end of the semester, fifteen novel phages were isolated with a wide range of characteristics, despite the small sampling area. This data was submitted to the Mycobacteriophage DataBase. After analysis and class discussion, the DNA from three different phages were sent to the University of Pittsburgh for genome sequencing.

Poster Presentation P7

EFFECTS OF ALLOPREGNANOLONE ON OBJECT AND SPATIAL LEARNING

Sarah B. Hartman, Teresa Banks, Benjamin Becker, Josephine Fairall, Elise Haury, Kelli Sloan,
Scott Tesler, Kathryn Thomas, Malory Wodka, and Gregory P. Tinkler, Ph.D*.

Department of Psychology, Illinois Wesleyan University

Allopregnanolone (Allo) is a neurosteroid metabolite of progesterone. Allo modulates cognition, specifically learning and memory, but these effects are frequently confounded by its anxiolytic properties. We attempted to dissociate the anxiolytic effects of Allo from its mnemonic effects using a subthreshold pharmacological challenge with the stimulant d-amphetamine. We assessed both spatial and nonspatial memory. Spatial memory was tested in a Morris Water Maze, and nonspatial object memory was tested on a novel discrimination task. Allo, alone or in combination with d-amphetamine did not have any significant effects on spatial memory. Both Allo and amphetamine impaired novel object performance, but the combination of the two enhanced performance. The results suggest that, depending on the cognitive domain being tested, the sedative effects of Allo can be dissociated from mnemonic effects.

Poster Presentation P8

**ADRENALINE AND BEDAZZLINE: AN ENTHNOGRAPHIC ANALYSIS OF ISU'S
GAMMA PHI CIRCUS**

Sarah E. Carlson and Rebecca Gearhart*

Sociology and Anthropology Department, Illinois Wesleyan University

Through the use of visual media and collaborative ethnographic research as a method of inquiry, this poster presentation aims to gain insight into the culture of circus performance at Gamma Phi Circus of Illinois State University. Participant observation and informal interaction with the circus performers allowed me to work collaboratively with the students to create both text and images that define Gamma Phi as a unique community. This research highlights a structured atmosphere of student-driven teaching and learning that works to foster a strong sense of trust and community. These dynamics combine in a way that is necessary for the execution of the aesthetic ideals of circus performance and the creation of a show that is visually interesting and meets the standards of the group's audience, performers, and historical reputation.

Poster Presentation P9

RECIPROCAL COOPERATION IN RATS

Malory Wodka, Teresa Banks, Benjamin Becker, Josephine Fairall, Sarah Hartman, Elise Haury,
Kelli Sloan, Scott Tesler, Kathryn Thomas, and Gregory Tinkler*

Psychology Department, Illinois Wesleyan University

Reciprocal cooperation means working together with another individual to increase the likelihood of future cooperation. It can be explained evolutionarily because it promotes the fitness of individuals in certain conditions. Cooperation is common in humans, however rats display cooperative behaviors under certain conditions. This study examines conditions for cooperation in rats by testing housing conditions and prior interactions between cooperating rats in a Prisoner's Dilemma task. Furthermore, this study examines the effects of the neurosteroid Allopregnanolone on cooperation. We hypothesize that Allopregnanolone will increase social cooperation behaviors based upon its ability to increase nonspatial memory capacity. We did not find evidence that Allopregnanolone significantly influenced measures of cooperation, although there was a statistical trend towards greater cooperation in the Allopregnanolone-treated animals.

Poster Presentation P10

NATURE OF FRICTION WITHIN SYSTEM OF INTERLEAVED SHEETS

Jonathan Castro, Alejandro Mancera, and Bruno deHarak*
Physics Department, Illinois Wesleyan University

In this experiment, sheets of paper were interleaved. The static friction within the system was measured by recording the force required to pull the sheets apart as the number of sheets, and the thickness of the sheets increased. This was done in order to find function of friction relative to number of surfaces and relative to mass. This experiment proves to bring a better understanding of why an enormous amount of force is required in order to pull many interleaved sheets apart. This information proves that, in fact, friction increases quadratically, and not linearly, which is the most popular theory today.

Poster Presentation P11

**ISOLATION OF *RHODOBACTER CAPSULATUS* BACTERIOPHAGES AND
DEVELOPMENT OF OPTIMAL INFECTION CONDITIONS**

Brooke Bernardoni, Matthew R. Bockman, and David W. Bollivar*
Biology Department, Illinois Wesleyan University

Few studies have been performed regarding bacteriophages that infect photosynthetic bacteria. *Rhodobacter capsulatus* is a photosynthetic bacterium that has been used as a model system for studying the genetics of photosynthesis. It has been used as a host for bacteriophages in the past, but most of this work was performed prior to the advent of molecular biology. Three bacteriophages have been isolated that will infect *Rhodobacter capsulatus*. During the course of the studies described in this poster, it was discovered that different strains of this bacterium have very different susceptibilities to infection by bacteriophages. The isolated bacteriophages were discovered from water samples taken from a creek in the Bloomington/Normal, Illinois area. The *R. capsulatus* strain YW1C-6 showed evidence for increased susceptibility for bacteriophage infection when compared to the St. Louis strain. Following isolation and purification of these bacteriophages, optimal conditions for bacteriophage infection were developed to enhance isolation techniques for further studies.

Poster Presentation P12

**BEYOND THE SHIRT AND TIE: VALUES, BELIEFS, & PRACTICES
AMONG MEMBERS OF THE CHURCH OF JESUS CHRIST OF
LATTER DAY SAINTS IN BLOOMINGTON**

Joseph Daniels and Rebecca Gearhart*

Sociology and Anthropology Department, Illinois Wesleyan University

Using photographic and collaborative ethnographic methods, this poster presentation sheds light on the LDS (Church of Jesus Christ of Latter Day Saints) community in Bloomington, IL. I attended and participated in services, as well as interviewed members of the community for pertinent information about organization and membership. The photographs in the poster were taken during the three-hour Sunday services held in the meetinghouse during the month of February, 2012. A collaborative effort allowed for the accurate representation of aspects of the community's beliefs and practices. Due to the sacredness of some of the services, members of the community and I designed alternative strategies to represent important rituals that could not be documented in real time.

Poster Presentation P13

**EDUCATION, EVOLUTION, AND POWER THROUGH INK:
AN ETHNOGRAPHIC PHOTO ESSAY ON TATTOOISTS IN NORMAL, IL**

Elizabeth Daniels and Rebecca Gearhart*

Sociology and Anthropology Department, Illinois Wesleyan University

This poster presentation aims to illustrate how methods of visual anthropology were employed to gain insight into the culture of tattooists working at Artkore Tattoo in Normal, Illinois. It demonstrates how the use of collaborative methods of participant observation, formal interviews, photography, and informal interaction were used to create text and images that accurately represent issues that concern the tattooists. The essay highlights the importance tattooists attribute to their continuous education that facilitates in the evolution of their work and skills. It discusses why some members of the tattoo community view themselves as “craftsmen” rather than “artists.” The presentation also approaches the subject of power among the tattooists and how this affects their relationship with their clients.

Poster Presentation P14

COULOMB BLOCKADE EFFECTS IN MESOSCOPIC ELECTRONIC DEVICES

Janak Thapa, Qing Ding, and Gabriel C. Spalding*
Physics Department, Illinois Wesleyan University

In our research, we aim to examine the Coulomb blockade, where all electron current is suppressed below a (tunable) threshold voltage. This thresholding effect occurs because of the energy required for charging individual nanoparticles, and so our devices can become sensitive to single-electron transport between droplets. In our approach, two liquid-metal (gadolinium) droplets, which are coated with a monolayer of ligand-stabilized (gold) nanoparticles, were brought into contact. They do not coalesce but instead remain separated by the nanoparticles assembled at the interface. Micrometer-scale Ga droplets coated with nanoparticles were fabricated using ultrasonication and then deposited on substrates with patterned interdigitated electrodes, to form mesoscopic electronic devices. Right now, we working to lower the threshold voltage, and hope to eventually produce gated devices (self-assembling single-electron transistors).

Poster Presentation P15

**PUSHING THE LIMITS: A VISUAL ETHNOGRAPHIC EXPLORATION
OF INDOOR ROCK CLIMBING**

Katherine Filippo and Rebecca Gearhart*

Sociology and Anthropology Department, Illinois Wesleyan University

Through the use of photographs and collaborative ethnographic research methods this poster presentation raises awareness about the multi-faceted nature of indoor rock climbing and the Upper Limits climbing community. Utilizing participant-observation, formal interviews, and informal interaction, I worked collaboratively with climbers at Upper Limits to create both text and images that define the way in which these climbers create a sense of community. The aim of this poster is to highlight the physical, mental, and social aspects of indoor climbing, which are central to a climber's identity. This research allows the climbers to showcase their own abilities and experiences in an effort to promote the benefits of indoor climbing to the public.

Poster Presentation P16

COME ON UP: THE CULTURE OF IWU SLAM AND PERFORMANCE POETRY

Dariusz Jakubowski and Rebecca Gearhart*

Sociology and Anthropology Department, Illinois Wesleyan University

This poster presentation provides an intimate look at the Illinois Wesleyan University Slam and performance poetry community through the use of images and collaborative ethnographic methods. By analyzing the photographs taken during the creative process of composing poems and of the Slam event itself, the core values of openness, importance of the individual, and the vital role mentors play become apparent. The research sheds light on lesser-known aspects of performance poetry generally and on the community of Slam poets at IWU in particular.

Poster Presentation P17

TESTING BINARY POLYNOMIALS FOR IRREDUCIBILITY

Steven Hayman and Andrew Shallue*
Mathematics Department, Illinois Wesleyan University

A binary trinomial is a polynomial with three terms whose coefficients are either zero or one. A polynomial is irreducible if it does not have any nontrivial factors. Irreducible binary trinomials have a number of cryptographic and hardware applications. We have tested close to 5 billion binary polynomials for irreducibility. This computation was the result of combining various techniques from the literature.

Poster Presentation P18

**CRU: BUILDING CHRIST-BASED RELATIONSHIPS AT
ILLINOIS STATE UNIVERSITY**

Cassandra Jordan and Rebecca Gearhart*

Sociology and Anthropology Department, Illinois Wesleyan University

This poster explains what the Illinois State University Campus Crusade for Christ (ISU Cru) members stand for in their spiritual journey to grow in their relationship with Jesus Christ. Through the use of visual ethnographic methods (interviewing with photographs and participant-observation) to facilitate conversation and collaboration with active male and female leaders of Cru, a general consensus was reached about the main goals and beliefs of this growing evangelical Christian movement. The research illustrates the importance of a group trying to live together and grow in their relationship with Christ through evangelism and discipleship.

Poster Presentation P20

**ON EDWIN H. LAND'S RETINEX THEORY: DEVELOPING A CLASSROOM
DEMONSTRATION FOR COLOR VISION**

Joseph Lim and Bruno deHarak*

Biology and Physics Departments, Illinois Wesleyan University

The phenomenon of visual perception is a fundamental process that many take for granted. Perception of color is important because it allows for the identification of food, avoidance of possible threats from the environment and communication.

Color perception begins when light from the environment is absorbed by the color detecting photoreceptors in the retina. These photoreceptors converge onto color-coded horizontal cells, ganglion cells, lateral geniculate cells of the parvocellular division and cells of the visual cortex. Understanding this relationship, Edwin H. Land coined the term "Retinex" to demonstrate that color perception involves all levels of visual processing, from retina to cortex. The goal of this project is to develop a simplified classroom demonstration of the Retinex theory of color vision. We used Kodak® black and white film to produce two images. The first image was taken using a red filter and projected with a longer wavelength of yellow light. The second image was taken using a green filter and projected using a shorter wavelength of yellow light. When each image was projected individually all that is perceived is a yellow and black image. However, when both images are projected simultaneously and superimposed, perception of color of the full visual spectrum is possible. This demonstrates that color perception is not dependant on the wavelength of light that is reflected from an object but that it occurs by comparing the ratio of longer and shorter wavelengths of light that is reflected.

Poster Presentation P21

**THE EFFECT OF LOAD ON FRONTAL THETA RESET
IN A WORKING MEMORY TASK**

Maxwell Lustick and Joseph Williams*

Psychology Department, Illinois Wesleyan University

Working memory, an executive function that actively maintains information in the mind while other complex tasks may be performed, is used in higher order tasks such as problem solving, decision making, and planning. Effortful use of cognitive resources when utilizing working memory can be measured by comparing the levels of theta frequency in an electroencephalogram (EEG). The theta frequency band is the oscillation of the brain's electrical activity between 4-8 Hz. This study seeks to define the function of theta rhythm in the human brain and ultimately a more complete understanding of human memory. In order to do this, participants' neural activity is recorded during a visual working memory task to discover the effect of memory load on the observed theta rhythm.

Poster Presentation P22

A MULTIMODE FLUORESCENT MICROSCOPE

Boxiang Liu and Nathaniel Nesbit and Gabriel Spalding*
Physics Department, Illinois Wesleyan University

We present research related to the design and construction of a biopotential measurement device that can be utilized for Electroencephalograph (EEG), electrocardiograph (ECG), electromyograph (EMG), and electrooculograph (EOG) measurements. Novel aspects of this device include JFET-based active electrodes, the stringent use of shielding and balancing methods, as well as other low-noise techniques and components. The circuit includes a pre-amplifying stage, an active low pass filter, an active high pass filter, and a final amplifying stage. An integrator is included for the EMG measurement. A switch enables the user to pick between modes of measurement. Our goal for the immediate future is to combine multi-channel signals to control a game named Osmos, which requires directional signal and speed signal inputs.

Poster Presentation P23

**NEGATIVE AFFECT AND ITS EFFECT ON NEURAL ACTIVITY
AND REACTION TIME**

Katy McCortney and Jason Themanson*

Psychology Department, Illinois Wesleyan University

The present study examined the relationship between negative affect, reaction time (RT), and the error-related negativity (ERN). Participants were twenty-six undergraduate students from Illinois Wesleyan University enrolled in General Psychology. Participants completed two blocks of emotional flanker task stimuli. Stimuli were selected from the International Affective Picture System (IAPS; Lang et al., 2005) and varied on arousal (high, low) and affect (negative, positive). Electroencephalogram data was collected and analyzed for the ERN and RT based on the stimuli's arousal. Results showed that the ERN and response accuracy (RA) were sensitive to the arousal levels, showing more negativity and RA to the non-arousing photographs. A high correlation was found between negative arousing stimuli and the ERN and RA. These findings indicate that arousal influences response monitoring and RA. However, RT appears to be sensitive to negative affective information, with differences seen across arousal levels.

Poster Presentation P24

**METABOLIC CONTRIBUTION OF PARTICULATE MATTER ($<1\mu\text{m}$) FOR LARVAE
OF *LYTECHINUS VARIEGATUS***

Matthew McShane and William Jaeckle*
Biology Department, Illinois Wesleyan University

Echinoderm larvae possess an external band of cilia that beat in one direction for locomotion and undergo localized beat reversal when triggered by particles ($\geq 2\text{ mm}$), pushing these particles towards the mouth for ingestion. Particles below adequate size, if ingested, must be collected by passing seawater through the digestive system. We measured the ability of pluteus larvae of *Lytechinus variegatus* to capture bacteria-sized particles after exposing them to $0.513\mu\text{m}$ fluorescent beads (9.5×10^5 beads/mL) for 10 min. Beads were found in the digestive system in 75% (41 of 55) of larvae and the average ingestion rate was $39.4 (\pm 42.7 \text{ SD})$ beads/h. From these ingestion rates we calculated clearance rates (mL/ larva-h) and used literature values for bacterial energy content and larval metabolism to estimate the energetic contribution of bacteria-sized particles. Assuming 100% assimilation efficiency and 10^6 cells/mL, we found that feeding on bacteria-sized particles could provide for only 0.16% of metabolic rate.

Poster Presentation P25

**AMPEROMETRIC DETECTION OF NEUROTRANSMITTER RELEASE FROM
TASTE BUDS IN RESPONSE TO SOUR AND FATTY TASTANTS**

Aaron Moore and Melinda Baur*

Chemistry Department, Illinois Wesleyan University

The goal of this project is to elucidate the mechanism by which taste signals are transduced within taste buds using an electrochemical technique known as amperometry. The sense of taste is important for animals because it allows animals to recognize food, derive pleasure from food, and to detect food that may be unsafe to eat. The neurotransmitters serotonin and norepinephrine are released from taste cells in response to taste stimuli. Amperometry has been used to detect the release of these neurotransmitters from taste buds. This technique has been used to identify and characterize the taste responses to sour and fatty tastants.

Poster Presentation P26

**A SIMPLE EXPERIMENTAL VERIFICATION OF
MAXWELL-BOLTZMANN STATISTICS**

Carl Mueller, Patrick Dahl, and Gabriel Spalding*
Physics Department, Illinois Wesleyan University

The purpose of this research is an experimental verification of Boltzmann statistics. The goal is to design an experiment simple enough to demonstrate these ideas, which lie beyond the range of common experience, which can be completed by undergraduate students as part of normal undergraduate physics lab work. Several distinct but related experimental tests are under way. First, it will be shown that colloidal particles allowed to sediment follow the Maxwell-Boltzmann distribution. Second, it will be shown that these same colloidal particles diffusing in a spherical potential well do so in accordance with Boltzmann statistics. Finally, these same particles can be optically trapped, and from the Boltzmann statistics, we can extract the shape of the effective (optically defined) potential well.

Poster Presentation P29

ALCOHOLISM

Kristyn Paradis and Darryl Brown*

Business Administration, Illinois Wesleyan University

For years, alcoholism has been looked down upon and believed to be a matter of choice. However, more recently, scientists have come to the conclusion that alcoholism is a disease, and they theorize that it is genetically inherited. This paper will focus on the impact that both nature and nurture have on the development of alcohol dependency. If the origin of these addictions could be established, more effective treatment methods may emerge. Through extensive case studies, predominantly focusing on twins—both fraternal and identical—scientists have discovered a correlation between addictive tendencies and heredity. There is a plethora of evidence that demonstrates the physiological changes associated with addiction and their biological roots. These propensities can also be linked to a generalized “addiction gene,” which may result in other dependences. Along with these origins, there are environmental influences that can trigger and enhance certain dispositions. Peers, race, and culture all have social implications on alcoholism. These factors, along with other aspects of alcohol addiction will be explored in this paper.

Poster Presentation P30

LA UTILIZACIÓN DE LAS UNIDADES DE CUIDADOS CRÍTICOS Y DE EMERGENCIA POR PARTE DE LOS HISPANOS EN EL SUROESTE DE LOS ESTADOS UNIDOS

(The use of critical care units and emergency departments by Hispanics/Latinos in the Southwestern United States)

Jarod Pope* and Carmen Ferradans*
Hispanic Studies Department, Illinois Wesleyan University

Asistencia sanitaria y el acceso a la asistencia sanitaria se ha convertido en un tema de importancia nacional, tanto para los profesionales médicos y los políticos. Uno de los mayores grupos que se están evaluando son los latinos e hispanos que pueden o no pueden ser cubiertos por el seguro médico tradicional. Este estudio tiene como objetivo investigar la utilización de las unidades de cuidados críticos y urgencias de los hispanos y latinos en el suroeste de Estados Unidos en comparación con otras densamente pobladas zonas urbanas. Los efectos de una mayor carga de pacientes, seguro médico, y las razones principales de su uso será evaluado por los miembros de la población del estudio objetivo de uso de las instalaciones, así como las razones de aquellos que eligen no utilizar estos servicios médicos tradicionalmente caros.

Healthcare and access to healthcare has become a topic of national importance for both medical professionals and politicians. One of the largest groups that is being evaluated are Latinos and Hispanics that may or may not be covered by traditional medical insurance. This study aims to investigate the utilization of critical care units and emergency departments by Hispanics and Latinos in the southwestern United States compared to other highly populated urban areas. The effects of a higher patient load, medical insurance, and primary reasons of use will be evaluated for those members of the target study population using the facilities, as well as the reasons for those who choose to not use these traditionally expensive medical services.

Poster Presentation P31

MONTE CARLO SIMULATIONS OF ELECTRON SCATTERING EXPERIMENTS

Alan Russian and Bruno deHarak* and Mark Liffiton*

Physics Department and Computer Science Department, Illinois Wesleyan University

This project aims to look at the impact made by certain approximations in electron scattering experiments—specifically whether accounting for these approximation errors is necessary. When using a moveable gun mount, the interaction volume can be determined using a line and cylinder approximation. Data is presented comparing this approximation to the actual volume computed using a Monte Carlo method. A uniform gas distribution is compared to a cosine-squared distribution gas distribution. Additionally, an energy spectrum of a uniform beam is compared to a Gaussian beam for various polarization angles, and a comparison is made between representing the beam as a cone versus a cylinder.

Poster Presentation P32

**SOCIAL PHYSIQUE ANXIETY, SELF-ESTEEM, AND BODY IMAGE:
THE EFFECTS OF EXERCISING WITH THE OPPOSITE SEX**

Alyssa Schardt and Jason Themanson*
Psychology Department, Illinois Wesleyan University

The purpose of this study was to investigate the effects of coed exercise on social physique anxiety (SPA), body image (BI), and self-esteem (SE). SPA is the concern that others are negatively evaluating one's body or physical appearance, and is strongly related to BI and SE. Although once believed to be stable traits, SPA, BI, and SE are now recognized to vary between situations; therefore, it is reasonable to assume that different exercise environments could influence these variables. Students in pre-established physical education courses completed pre and post- questionnaires and were categorized into a single-sex, minority-sex, majority-sex, or equal-sex categories based on the number of males and females enrolled. Results indicated that SPA decreased over time in an exercise program among females, but no differences were found based on the presence of the opposite sex. However, among males, differences in BI were observed based on class categorization and time spent in an exercise program.

Poster Presentation P33

**SCANNING ELECTROCHEMICAL MICROSCOPY MAPPING OF
NEUROTRANSMITTER RELEASE SITES FROM MODEL NEURONS**

Jennifer A. Schreiber and Melinda Baur*
Chemistry Department, Illinois Wesleyan University

Scanning Electrochemical Microscopy (SECM) was used to image the topography of model neurons in the constant height mode while simultaneously measuring neurotransmitter concentration using amperometry in the collector mode. The probe of the SECM was a fabricated 5 μm carbon-fiber electrode. The electrode was calibrated to determine the distance to the surface. Topographical imaging was accomplished by moving the electrode systematically across the surface. Multiple topographical images were obtained before and after stimulation of the model neurons with KCl. Neurotransmitters norepinephrine and dopamine were detected by setting the electrode to an oxidizing potential (+0.8 v). After stimulation, neurotransmitter release was detected amperometrically during topographical mapping. Download this file and use it as a template.

Poster Presentation P34

SEARCHING FOR TOLERANCE: A CLOSER LOOK AT IWU HILLEL

Katelyn Scott and Rebecca Gearhart*

Sociology and Anthropology Department, Illinois Wesleyan University

This poster presentation demonstrates how I used participant observation, interviewing, and collaborative visual ethnographic methods to gain insight into what it is like to be a Jewish student at Illinois Wesleyan University. This poster highlights three pertinent issues that members of IWU Hillel want to convey: their lack of a sacred space of their own on campus, the various ways Jewish identity can be experienced and expressed, and how non-Jewish students relate to their Jewish identity and towards Judaism in general. This presentation allows members of IWU Hillel to have their voices heard and to further educate other students at IWU about their beliefs with the hope of bringing a greater degree of religious tolerance to campus.

Poster Presentation P35

HYPOXIA-ISCHEMIA IN THE IMMATURE BRAIN AND MECHANISMS OF REDUCING TISSUE DAMAGE

Victoria Simmons and Susan Vannucci* and Edgar Lehr**

*Research Director of Newborn Medicine, Weill Cornell Medical College, New York, NY

**Biology Department, Illinois Wesleyan University

Cerebral hypoxia-ischemia in human infants presents a complex clinical problem in that no standardized treatment currently exists. With an understanding of the cellular and metabolic changes brought about during hypoxia-ischemia in the immature brain, researchers can better understand the course of damage caused by ischemia. Such damage was induced in young rats in an attempt to learn more about the mechanisms of hypoxia-ischemia. Seven-day-old rat pups underwent permanent unilateral carotid artery ligation and then were exposed to systemic hypoxia. At 15 days of postnatal age, researchers used neuropathologic analysis, gross examination, and staining of brain slices to assess the severity of damage from hypoxia-ischemia. Hypoxic preconditioning appeared to reduce or prevent tissue damage during a subsequent hypoxic-ischemic event.

Poster Presentation P36

IMPLICIT ENCODING EXPLORED THROUGH THE FLANKERS TASK

Jaclynn V. Sullivan and Rose H. Danek*
Psychology Department, Illinois Wesleyan University

We examined the process of selective attention and its relation to implicit and explicit memory encoding. To further understand the mechanisms behind selective attention, we asked if implicit learning of irrelevant information is encoded differently than explicit learning. We used the flankers task to examine selective attention. This task involves responding to a center item (i.e. the target), while ignoring the irrelevant flankers. Participants completed the correlated flankers task as well as implicit and explicit memory tasks. The correlated flanker effect is the decreased reaction time on the trials in which the flankers that are correlated with the correct response are present versus uncorrelated trials (Miller, 1987). Results were contrary to what we expected and reasons as to why this occurred are discussed. Opportunity for participation in discussion is welcome.

Poster Presentation P37

ATTACHMENT THEORY AND THE SEXUAL DOUBLE STANDARD

Erin A. Vogel and Amanda M. Vicary*

Psychology Department, Illinois Wesleyan University

The purpose of the present study was to investigate the relationship between participants' attachment styles and their exhibitions of the sexual double standard, i.e., the tendency to judge women who have had many sexual partners more harshly than men who have had many sexual partners. According to attachment theory, anxious adults are more jealous and fearful of abandonment, while avoidant adults are more distrustful and uncomfortable with intimacy. To investigate whether people's attachment style relates to their exhibitions of the double standard, we had participants read about a fictional male or female who reported having had 12 sexual partners or 1 sexual partner. Participants then evaluated the target person on a variety of domains, such as intelligence and values. Results indicated that anxious people tended to exhibit the sexual double standard for some domains; there was no relationship between attachment avoidance and evaluation of the targets.

Poster Presentation P38

BACTERIOPHAGE GENOMES ANNOTATION

Da Wang and David Bollivar*
Biology Department, Illinois Wesleyan University

This project mainly focuses on analyzing the genomes functions of the bacteriophage Shrimp, which was purified and extracted in last semester. Shrimp is Myoviridae and belongs to the cluster C. After finishing the genome sequencing of Shrimp, we compared the similarity of those sequences to the known sequences by using DNA Master to predict the possible proteins that can be produced by Shrimp's genomes. BLAST and HHpred are used for searching our query protein sequence against all known predicted protein sequences to predict potential gene functions. The coding potential of open reading frames was detected by GeneMark. Aragorn helps to identify the locations and anticodons of tRNA genes in the Shrimp. After the annotation, although the functions of some parts of Shrimp were unknown, we found that Shrimp is very similar to phage Bxz1. The result will help the further identification of Shrimp.

Poster Presentation P39

NATURE VS. NURTURE: ATHLETIC ABILITY

Chen Hon Wang and Darryl Brown*

Business Administration Department, Illinois Wesleyan University

Athletes in the world are the best at what they do, whether it's basketball, football, soccer, or volleyball. They are the best at it. But why is that? Why can't everyone who desires achieve this level of performance? This debate and question has puzzled researchers for centuries. It is the debate of nature versus nurture. Those on the side of nature believe that the genes that a person possesses, is the sole reason why they are who they are. And the believers of nurture think that the environment in which a person grows up in is what makes them who they are. There is not a definite answer to this debate. A person's athleticism is based off of both their genes and also the kind of environment that he/she grew up in. Drawing on recent research in sports performance and evolutionary psychology, this essay takes a position in the middle and show evidence of why athleticism cannot be determined by just nature or just nurture.

Poster Presentationn P40

**WHEN WORDS FAIL, MUSIC SPEAKS: A VISUAL ETHNOGRAPHIC
EXAMINATION OF VOCAL PERFORMANCE CULTURE**

Hannah Williams and Rebecca Gearhart*

Sociology and Anthropology Department, Illinois Wesleyan University

Through the use of collaborative ethnography and photography, this poster provides insight into the vocal performance culture at Illinois Wesleyan University. Utilizing collaborative methods and visual media, this research provides an insider's perspective on the lives of vocal performers by demonstrating the qualities that members of the community find most significant. This poster visually examines the self-discipline that necessarily accompanies the lifestyle of vocal performers, as their bodies are their instruments and therefore must be well cared for. It additionally examines the self-confidence of vocal performers, in response to the critical and competitive nature of the field, and the emotional and physical connection that vocalists forge with their music.

Poster Presentation P42

**EXAMINING THE EFFECTS OF PARENTAL CONFLICT ON STUDENTS'
ROMANTIC RELATIONSHIPS AND WELL-BEING**

Elizabeth Williams and Marie Nebel-Schwalm*
Psychology Department, Illinois Wesleyan University

Illinois Wesleyan Students completed a multipart questionnaire regarding their relationships with parents, perceptions of parental conflict (CPIC), dating anxiety (DAS-A), attitudes about relationships and marriage (AARMS), experiences in close relationships (ECR-R), alcohol and drug use, study habits, and rates of depression and anxiety (DASS). Preliminary analyses indicate significant differences on the self-blame subscale of the Children's Perception of Interpersonal Conflict (CPIC) questionnaire. Students with high levels of self-blame for their parents' interpersonal conflict report higher levels of attachment-related anxiety in their romantic relationships, based on the Experiences in Close Relationships-Revised (ECR-R) questionnaire. Further analyses of the additional survey measures will also be addressed.

Poster Presentation P43

**THE DEVELOPMENT OF A NOVEL THERAPEUTIC FOR THE TREATMENT OF
SICKLE CELL DISEASE**

Cody Wynn and Brian Brennan*
Chemistry Department, Illinois Wesleyan University

Sickle Cell Disease is a genetic blood disorder caused by a point mutation in the gene which codes for hemoglobin in red blood cells. This mutation in the protein leads to the formation of long polymeric strands of hemoglobin that cause the red blood cells to misform into the characteristic sickled shape. These sickled red blood cells are too large to fit through capillaries and thus cause the problems associated with sickle cell disease such as anemia and tissue damage. Our approach towards developing novel therapeutics involves the production and screening of large libraries of small peptides which target the point mutation in an effort to discover ligands for the protein. Once ligands have been identified, we can determine if their interactions are sufficient to prevent protein polymerization. We will present some recent progress that we have made on this challenging biochemical problem.

Poster Presentation P44

SEX DISTRIBUTION OF THE PLUMBEOUS SIERRA-FINCH (*PHRYGILUS UNICOLOR*) IN RELATION TO THE CUENCA-MOLLETURO-NARANJAL HIGHWAY IN THE ECUADORIAN ANDES

Sarah Talcushi and Given Harper*¹, Xavier Silva², Sylvia Seger², Gabriella Samaniego Regalado³, Aguilar Juan Manuel³, Pedro Xavier Astudillo³

¹Biology Department, Illinois Wesleyan University

²School for International Training

³*La Universidad de Azuay*, Ecuador

The Cuenca-Molleturo-Naranjal highway was recently constructed through the páramo region of the Cajas National Park in the Ecuadorian Andes. The impacts of this highway on the park avifauna- including many endemic and endangered species- are unknown. The purpose of this study was to determine how the highway may have influenced the distribution of male and female Plumbeous Sierra-Finches, one of the most common finch species in the park. Using point transect counts in October, 2011 we observed both sexes (N = 88 sightings) at 18 park locations. There was an equal sex ratio in transects near the highway (< 1 km), while zones farther from the highway (>1 km) had a significantly greater proportion of males. These results suggest that the preferred breeding territories were closer to the highway, which may provide greater foraging opportunities.

Poster Presentation P45

A MULTI-CHANNEL, MULTI-MODE BIOPOTENTIAL MEASUREMENT DEVICE

Boxiang Liu and Thushara Perera*

Physics Department, Illinois Wesleyan University

We present research related to the design and construction of a biopotential measurement device that can be utilized for Electroencephalograph (EEG), electrocardiograph (ECG), electromyograph (EMG), and electrooculograph (EOG) measurements. Novel aspects of this device include JFET-based active electrodes, the stringent use of shielding and balancing methods, as well as other low-noise techniques and components. The circuit includes a pre-amplifying stage, an active low pass filter, an active high pass filter, and a final amplifying stage. An integrator is included for the EMG measurement. A switch enables the user to pick between modes of measurement. Our goal for the immediate future is to combine multi-channel signals to control a game named Osmos, which requires directional signal and speed signal inputs.

Poster Presentation P46

**“JUST PLAYNG ARMY?”: AN ETHNOGRAPHIC EXAMINATION OF
THE WARHAMMER COMMUNITY IN BLOOMINGTON-NORMAL**

Robert Diehl and Rebecca Gearhart*

Sociology and Anthropology Department, Illinois Wesleyan University

This poster presentation aims to generate discussion of the community surrounding the fantasy war-game Warhammer through photography and collaborative ethnographic methods. Utilizing participant observation of weekly gaming sessions, surveying, and formal interviews, the author worked with players to create a visual and textual representation of Warhammer players as a social community that transcends the boundaries of the game. This research highlights the dynamic between fun and competition, explores the surprising demographics of the player base, and dispels some of the common stereotypes about players.

Poster Presentation P47

LIFE HISTORY THEORY AND THE SEXUAL DOUBLE STANDARD

Yuliana Zaikman and Amanda Vicary*

Psychology Department, Illinois Wesleyan University

The present study sought to examine the relationship between the sexual double standard and life history theory. The sexual double standard is the idea that a man is rewarded for sexual behavior, whereas a woman is derogated. Life history theory posits that females who grow up with estranged relationships with their fathers or in divorced households view dating and relationships differently than do other females. To investigate a possible relation between life history theory and the double standard, we had participants report on their interactions with their parents and then rate fictional male or female targets who reported having had varying numbers of sexual partners. Results revealed a relationship between the marital state of female participants' parents and their exhibition of the double standard. Contrary to expectations, results also revealed a relationship between female participants' relationships with their mothers (but not fathers) and the exhibition of the double standard.

EDUCATIONAL STUDIES POSTERS - ES

9:00 – 10:00 a.m.

or

11:00 – 12:00 noon

Lower Level – Ames Library

EDUCATIONAL STUDIES ORAL PRESENTATIONS – ES

10:00 a.m.

Oral Presentation ES

**RACIAL SOCIALIZATION PRACTICES & THE ADOLESCENT AFRICAN
AMERICAN STUDENT**

Jazmyn Becker and Sumer Seiki*

Educational Studies Department, Illinois Wesleyan University

Research on racial identity socialization of African American adolescents places emphasis on the family's racial socialization practices and its impact on racial identity development (Caughy, Nettles, & Lima, 2010). There is a lack of investigation in the ways the education institution impacts racial identity development. Yet, some studies found an adolescent's sense of racial identity to be a moderator between the student in relation to school engagement and bonding, self image, defense against discrimination, academic achievement, and group acceptance (Chabous, Riva, Green, Helair, 2012; Dotterer, McHale, Crouter, 2009). A literary review and analysis of research in various fields including black psychology, was conducted to expand our understanding of the ways the education institution contributes to racial identity development of African American adolescents. My findings suggest that reinforcement of racial identity socialization practices in the classroom is necessary for positive racial identity development of African American adolescents.

Poster Presentation ES

WAYS TO INVOLVE PARENTS IN AND OUTSIDE THE CLASSROOM

Katherine Bell and Leah A. Nillas*

Educational Studies Department, Illinois Wesleyan University

Many educators agree that parental involvement is associated with school success by creating a positive relationship where parents and teachers can communicate about the students' progress. Whether through home- based or school- based activities, parents can have a great influence on their students' academic achievement. Using different instructional methods, I provided multiple opportunities to incorporate parent's involvement in students' education. In a Kindergarten grade level classroom, a variety of lessons were implemented that included different parental roles. *Grounded theory* (Glaser & Strauss, 1967) was used as the framework in analyzing lesson plans, teacher journals, students work, and parent-teacher questionnaires. These data sources were used to generate themes defining the ways to incorporate parental involvement in and outside the classroom.

Poster Presentation ES

PERCEIVED WRITING SELF-EFFICACY IN A FIRST GRADE CLASSROOM

Melissa Bittner and Leah Nillas*

Educational Studies Department, Illinois Wesleyan University

The purpose of this research is to determine which strategies best promote self-efficacy of writing in a first grade classroom. This research was conducted in an urban elementary school. Using two questionnaires, students were asked to reflect on self-perceptions of their abilities in writing. Students were also asked about their views of self-correcting using a rubric while writing. Student work, questionnaires, and teacher journals were analyzed for common themes and trends. Data showed the students' work improved through the use of self-correction methods. Qualitative data validated these personal beliefs, as students' writing errors decreased through the course of this study. Teacher written comments confirmed increases made in students' comprehension skills. Findings suggest that self-correction rubrics should be implemented in elementary classrooms in order to increase students' skills in writing.

Poster Presentation ES

THE ROLE OF GENDER IN THE SECONDARY ENGLISH CLASSROOM

Jessica Bozek and Jeanne Koehler*
Educational Studies, Illinois Wesleyan University

Gender roles in society are constantly at work and are especially relevant in the education system: a system in which seventy-six percent of public school teachers are female, and there is a growing gap between achievement in male and female students. Issues of gender may influence how students of a particular gender participate and relate to the classroom teacher. This study explores how gender connects with and contributes to student involvement in the classroom. The study was completed using a qualitative self-study approach and included various data collection methods including field notes, quality of student work, conducting discussions, and student responsiveness to differentiated content. Through the implementation of this study, it was found that male and female students respond differently to various discussion settings and group dynamics. It was also found that the gender of the instructor greatly influences the classroom environment, causing students' involvement and participation in class work to vary. Overall, planning and conducting class discussions and group work with attention to gender differences in the classroom is essential to creating an atmosphere in which all students can thrive.

Poster Presentation ES

ENHANCING CLASSROOM DISCUSSION WITH WIKI TECHNOLOGY

Caitlin Carpenter and Jeanne Koehler
Educational Studies Department, Illinois Wesleyan University

The need to incorporate technology into the classroom is undeniably present. In our ever-changing society, education must keep up with the latest advances to best serve all students. With this knowledge, I incorporated technology – specifically, a Wiki threaded discussion forum – into a literature classroom to determine the affect its implementation would have on both the quality and type of discussion held by students. This study was completed using a qualitative self-study approach and included various data collection methods, such as student responses made on the forum, personal reflections, and reflections from students regarding the perceived usefulness of the technology in aiding discussion. The findings of this study explore the impacts of incorporating this technology into the traditional classroom environment, and also look at student engagement with the Wiki. This information is not only helpful for the teaching of literature, but also presents opportunities to reflect on the overall effectiveness of technology integration in the classroom.

Poster Presentation ES

**THE IMPLEMENTATION OF GROUP INTERACTIONS TO ENCOURAGE
COOPERATIVE LEARNING: CULTIVATING AN ENVIRONMENT THAT
STIMULATES PARTICIPATION OUTCOMES**

Lauren Cowles and Jeanne Koehler*

Educational Studies Department, Illinois Wesleyan University

Cooperative strategies have been studied in secondary education classrooms for the past few decades. However, this study seeks to examine the linkages between cooperative learning techniques and student participation levels, a topic which has received little attention from researchers in the past. This topic is important to not only the educational field but also particularly the social sciences because of its emphasis on student involvement in the learning process through the informal exchange of intellectual ideas and co-construction of knowledge. This study was completed using a qualitative self-study approach and included a variety of data collection methods, such as observational field notes, journal reflections, evaluations, lesson plans, and student records. The results of this study found that cooperative learning fostered student engagement and activated student participation levels. The results of this study are useful; however, it also suggests further research is needed to explore this subject.

Poster Presentation ES

**MATH WORKSHOPS: A STUDY OF CONSTRUCTIVISM, PROBLEM SOLVING,
AND DIFFERENTIATED INSTRUCTION**

Claire Current and Robin Leavitt*

Educational Studies Department, Illinois Wesleyan University

This self-study explores the elements necessary for creating math workshops to meet the needs of a diverse group of learners. I aimed to discover the ways math workshops could provide an environment for students to problem solve and construct their own mathematical understanding. I designed three workshops based on the mathematical content being covered and implemented each the day before a quiz in mathematics. Data included the comparison of the plans for the workshop with student achievement on the subsequent quiz along with field notes and reflections. Based on this data, I developed a picture of the most effective workshop format in which prior instruction in problem solving is coupled with collaborative work on tiered and open-ended tasks. Providing whole class instruction to introduce multiple problem solving strategies and familiarizing students with a variety of constructivist tasks ahead of time, math workshops can be a successful tool for differentiating instruction.

Poster Presentation ES

MAKING MULTI-AGE WORK

Mary Edwards and Robin Leavitt*

Educational Studies Department, Illinois Wesleyan University

While student teaching in a combined first and second grade class, I was faced with the challenge of meeting the diverse needs of my students. In this study I address the challenges of teaching in a multi-age classroom. My goals were to develop an inclusive classroom community while exploring effective methods of organizing students for instruction, small group work, and independent practice. I employed a qualitative methodology, collecting data in the form of field notes, journal entries, student dialogues, student work, and lesson plans. I share stories of my successes and missteps and conclude that establishing an optimal multi-age classroom community works best when social and academic student relationships across grade lines are encouraged and the benefits of multi-age grouping are discussed with students. Additionally, I found that student learning was most successful when students were placed in changing and flexible groups and worked with others of various achievement levels.

Poster Presentation ES

**ASPECTS OF PARENTAL INVOLVEMENT THAT INCREASE STUDENT
ACADEMIC SUCCESS**

Caitlin Eskew and Sumer Seiki*

Educational Studies Department, Illinois Wesleyan University

There always has been an overarching trend that parental involvement has a positive impact on the academic success of a student. Despite this idea, there is no definition of “parental involvement” so we are left without knowing which practices promote the academic success of a student. Through the study of many peer reviewed research studies and articles, I have focused my literature review on the aspects of parental involvement that have the most beneficial impact on student academic success – involvement at home and involvement in a student’s motivation (Gonzalez-DeHass, Willems & Holbein, 2005). With this information, present and future teachers and parents can improve the educational success and experience for students.

Poster Presentation ES

**MAKING MORE TIME FOR SOCIAL STUDIES: INTEGRATING SOCIAL STUDIES
INTO READING INSTRUCTION THROUGH WHOLE CLASS READ-ALOUDS**

Krista Felten and Robin Leavitt*

Educational Studies Department, Illinois Wesleyan University

It is not uncommon in many elementary classrooms today, that subjects such as social studies receive limited daily instruction time in favor of mathematics and literacy. This situation, in my second grade student teaching classroom, inspired me to study the practice of using read-alouds during literacy time to introduce and reinforce social studies content. I read selected children's literature aloud to the whole class and we discussed the story, highlighting its connections to social studies, during and after my reading. I used children's literature, field notes, and student reflection assignments to draw the conclusion that the integration of social studies into reading instruction was an engaging and practical way to expand students' exposure to and knowledge of topics in social studies. Specifically, I also concluded that read-alouds facilitated my students' application of vocabulary and their ability to make connections to other texts as well as to the world around them.

Poster Presentation ES

INTEGRATING “JUST-RIGHT” BOOKS INTO THE SCIENCE CURRICULUM

Samantha Ford and Robin Leavitt*

Educational Studies Department, Illinois Wesleyan University

In many classrooms, it is becoming more common for teachers to supplement their students' textbooks with commercial trade books. While student teaching in a fourth grade classroom, I noticed that the majority of my students had difficulty comprehending and staying engaged in their science textbook. I decided to find a wide range of books that contained science material from a specific unit and encouraged the students to self-select “just-right” books from the collection. Through data analysis of field notes and student reflections, I learned what I should take into account when choosing trade books to supplement the science curriculum, including the importance of content accuracy. I also examined my students' interactions with the trade books. I found that they generally had a positive response when granted access to a selection of books for their independent reading and used them to demonstrate their resourcefulness.

Poster Presentation ES

INCORPORATING AUTHENTIC ASSESSMENT INTO SOCIAL STUDIES

Kirsten Fredrickson and Robin Leavitt*

Educational Studies Department, Illinois Wesleyan University

This self study focuses on the incorporation of authentic assessments into the social studies curriculum of a second grade class. My goal was to incorporate assessments that were more creative and thought provoking than traditional assessments. From the literature review I concluded that authentic assessments support students' higher order thinking skills and allow students to demonstrate their knowledge in an individualized manner. Thus, I implemented assessments that included simulations, research, and literature discussions. Data collection included the lessons plans that led up to the assessments, student work, and my observations of students during the assessments. Data analysis indicated that students were actively involved in these assessment activities and were able to successfully demonstrate what they had learned, whereas their performance on traditional assessments, such as quizzes, was less successful.

Poster Presentation ES

INCORPORATING VISUALS IN A SECONDARY ENGLISH CLASSROOM

Anne Fritsch and Jeanne Koehler*

Educational Studies Department, Illinois Wesleyan University

A high school English classroom provides avenues to include elements of other disciplines, one being visual art. I incorporated visual art in lessons throughout student teaching. The focus of this self study is on the inclusion of art within three Honors English 9 classes during a *Romeo and Juliet* unit. This study uses various examples of student work as well as observational field notes to provide insight into student responses to using visuals. The data from this study as well as existing research coincide and suggest incorporating visual art into English classes is an effective way to increase student engagement and bolster understanding. In future implementation of visuals in the English classroom, it will be important to include visual art on a consistent basis and ensure students understand the educational value of visual art.

Poster Presentation ES

**BUILDING A COMMUNITY OF WRITERS:
IMPLEMENTING WRITER'S WORKSHOP IN A FIRST GRADE CLASSROOM**

Kristen Gattuso and Robin Leavitt*
Educational Studies Department, Illinois Wesleyan University

The approach to writing instruction for first graders often involves giving rigid prompts to complete, inhibiting the creativity and imagination that young writers are more than capable of exercising. In an attempt to avoid such a practice, I implemented a writer's workshop in a first grade classroom during my student-teaching experience. By explicitly teaching the writing process through mini-lessons and offering authentic writing experiences, I examined the effectiveness of writer's workshop on student motivation and writing quality. Using descriptive field notes and student work samples, I provide a narrative account of my three-month self-study and the positive response of my students. The results suggest that the writer's workshop was effective in motivating students to write as well as improving writing quality. Implementing this framework as early as first grade can help to instill a passion for writing, a skill that is increasingly necessary for academic success as students get older.

Poster Presentation ES

ATHLETIC EXPENDITURES AND ACADEMIC ACHIEVEMENT

Tommy Gilbert and Sumer Seiki*

Educational Studies Department, Illinois Wesleyan University

During the recent period of economic difficulty, public school funding has become a major source of controversy in many communities. In addition to commonly discussed topics such as standardized testing and pension plans, the monetary requirements of interscholastic athletic programs have faced considerable scrutiny. Though various organizations have conducted studies of the relationship between athletic expenditures and academic achievement, few of these localized studies have produced results that are easily extrapolated to most American schools. By analyzing a variety of research studies, I found a negative correlation between athletic expenditures and academic achievement. Additional research is necessary, however, to determine the significance of the correlation. It is clear that schools will need to grapple with difficult budget decisions in the near future, as alternative sources of athletic funding appear limited.

Poster Presentation ES

STUDENTS' COMMON MISCONCEPTIONS ON BASIC MATHEMATICS SKILLS

Brittany Gonio and Leah Nillas*

Educational Studies Department, Illinois Wesleyan University

This study investigated high school students' misconceptions on basic mathematics skills, and how these misconceptions influenced their higher-level skills over the course of an Algebra unit. This research was conducted in an urban classroom in Illinois, within four Algebra II classes and one Geometry class. Students took five mastery quizzes to assess their basic mathematics skills over the course of a semester. Mastery quizzes and teacher journals were content analyzed (Neuendorf, 2002) to determine common misconceptions among students in the areas of fractions, decimals, percentages, integers, and scientific notation. Findings illustrate common misconceptions of basic mathematics skills among high school mathematics students and how these affect their learning of advance materials.

Oral Presentation ES

**SMART BOARD LIMITATIONS AND EFFECTIVE ACTIVE
LEARNING STRATEGIES**

Timothy Gordon and Jeanne Koehler*
Educational Studies Department, Illinois Wesleyan University

Active learning strategies are necessary in creating an interactive classroom. It is notable that technology is one tool teachers must incorporate in order to increase student engagement in 21st century classrooms. Determining what technology works and exploring alternative active learning strategies such as lectures, group work, and alternative assessments sheds light on the most diverse approach to an effective, interactive classroom. This study was completed using a qualitative self-study approach and included varying data collection methods such as field observations, relevant assignments, student work, and student teaching evaluations. Results showed that while technology is a necessary learning tool, other traditional modes of learning contribute to an interactive classroom.

Poster Presentation ES

ANTI-LGBTQ + RELATIONAL-AGGRESSION IN ADOLESCENTS

Jessica Gorecki and Sumer Seiki*

Educational Studies Department, Illinois Wesleyan University

In order to counter the issue of bullying in schools, we must first paint a more complete picture of both the issue, and the motivation. Bullying victims are often left voiceless; and sexual minority or perceived sexual minority students who have been the victims of bullying delve deeper into silence. Several questions guided my research: 1) To what extent do educators recognize/discipline anti-bullying policies (including covert instances?), 2) What influences educators decisions to intervene? And 3) What are students saying about their experiences?

It is my goal that through this diversified literature review to allow these students' voices to be not only listened to, but more importantly to allow them to be heard and remembered.

Poster Presentation ES

**RETENTION THROUGH SONG
ONE TEACHER'S JOURNEY WITH SONG IN THE CLASSROOM**

Susan Hager and Robin Leavitt*

Educational Studies Department, Illinois Wesleyan University

This self-study, which investigated the use of music in the classroom, was prompted by my love and passion for singing and music. My goal was to see if incorporating songs into lessons would reinforce content in grammar, math and science and increase retention of material, as well as students' excitement for music. Additionally, I aimed to see if it would peak students' enjoyment while learning. Analysis of field notes, student journals, and other student work, suggest that using songs as a vehicle to reinforce information helps students retain content and make learning enjoyable.

Poster Presentation ES

UTILIZING THE CLASSROOM LIBRARY TO MOTIVATE STUDENTS

Jenna Jameson and Leah Nillas*

Educational Studies Department, Illinois Wesleyan University

In this research inquiry, I focused on my student teaching experiences in an urban Kindergarten classroom where I observed students developed multiple reading needs, wants, and interests. I investigated how to use the *classroom library* to motivate students in their learning and personal reading. I developed and implemented a plan that used student activity centers, questionnaires, and lesson plans that utilized my cooperating teacher's classroom library. I analyzed data using *content analysis* (Neuendorf, 2002). Classroom activities involve listening, implementing word workstations that featured books in the classroom library, using book displays to drive instruction, and incorporating literature in lessons. They were examined through student inquiries and interviews. My findings support that motivation is influenced by the way the classroom library is presented and how well it is utilized to engage students in reading.

Poster Presentation ES

**MOTIVATING HIGH SCHOOL ENGLISH STUDENTS THROUGH
PRACTICAL AND CREATIVE WRITING ASSIGNMENTS**

Courtney Keenan and Sumer Seiki*
Educational Studies Department, Illinois Wesleyan University

High school English class content in the United States is most often geared toward responding to literary texts and passing standardized tests, and because of this lack of variety and purpose in the curriculum, students are not motivated to write (Daisey, 2009). I analyzed teacher-action research studies to find ways of effectively incorporating creative and practical writing in the classroom to increase motivation and self-efficacy in students. If educators rethink the English curriculum to be more writing-centric, students will become better writers and communicators by practicing a wider variety of writing styles. Additionally, giving students freedom of choice in their assignments and providing assignments that have future relevance can help students find enjoyment in writing. Incorporating assignments that foster autonomy and individual voice is crucial to the development of our nation's writers (Cox, 2009).

Poster Presentation ES

THE IMPACT OF DIVORCE ON ADOLESCENT STUDENTS

John Koschnitzky and Sumer Seiki*

Educational Studies Department, Illinois Wesleyan University

Divorce is a rapidly growing issue in today's society and the children are the ones who are impacted the most (Dykeman, 2003). In this literature review on how divorce impacts adolescent students, including grades 4-12, several studies have been analyzed that cover the topics of family environment, academic achievement, and behavioral problems associated with divorce. The findings show divorce has several negative impacts on children including: struggling to adjust to a new family environment, decreased chances of reaching full academic potential, and an increased chance of problem behavior inside and outside of school. The information in this literature review is important because it informs parents, teachers, and administrators understand why children act certain ways while coping or adjusting to a divorce. It is crucial that we understand how children are impacted by divorce so we can help children adjust to divorce in a more positive and beneficial way.

Poster Presentation ES

**THE EFFECT OF CLASS SIZE ON LOWER LEVEL STUDENTS
ACADEMIC ACHIEVEMENT**

Andy Kozlowski and Sumer Seiki*

Educational Studies Department, Illinois Wesleyan University

We examined the process of selective attention and its relation to implicit and explicit memory encoding. To further understand the mechanisms behind selective attention, we asked if implicit learning of irrelevant information is encoded differently than explicit learning. We used the flankers task to examine selective attention. This task involves responding to a center item (i.e. the target), while ignoring the irrelevant flankers. Participants completed the correlated flankers task as well as implicit and explicit memory tasks. The correlated flanker effect is the decreased reaction time on the trials in which the flankers that are correlated with the correct response are present versus uncorrelated trials (Miller, 1987). Results were contrary to what we expected and reasons as to why this occurred are discussed. Opportunity for participation in discussion is welcome.

Poster Presentation ES

MAKING SENSE OF INSTRUCTIONAL CLASSROOM TECHNOLOGIES

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As technology becomes more ingrained in our lives, teachers are faced with the challenge of incorporating technology in their lessons to engage the “Millennial Generation”. With this challenge in mind, I incorporated technology into my classroom in order to observe the effects of technology in a high school Spanish class. This study uses qualitative data that was gathered from field notes, observations, and student responses and feedback. Through my student teaching experience I found that technology can aid in student engagement, if used appropriately, but that there were differences in student and teacher preferences with regards to technology. While the transition to using technology in the classroom can be difficult, this study provides insight to educators on the effective implementation of technology to create an engaging and meaningful learning environment.

Poster Presentation ES

THE DAILY INTEGRATION OF COLLABORATION IN THE CLASSROOM

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Collaboration and cooperation among students has been proven to promote academic learning, social skills, and self-awareness. This self-study details my experiences integrating collaborative activities into the classroom during my student teaching experience with an aim of effective collaboration. The activities fell into three categories: collaboration for review, collaborative reasoning and problem-solving, and collaboration in classroom management, and were recorded through detailed field notes and observations, video clips, pictures, student work samples, and lesson plans. I found that conceptual, discussion-based, or brainstorming activities resulted in the most successful forms of collaboration and that some level of structure was necessary for collaborative activities. This study taught me that collaboration which complements the activity increases student motivation and learning in my classroom.

Poster Presentation ES

MATH SELF-EFFICACY AND PERFORMANCE

Olivia Lett and Leah Nillas*

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Bandura states that self-perceptions can affect a student's actions, thus affecting performance in the classroom regardless of actual knowledge (as quoted in Pajares, 1995). The purpose of this research study is to determine any relationship between math self-efficacy and performance in the classroom. This research was done in an Algebra II classroom in an urban high school. Through the use of teacher journals, questionnaires, exit slips, and recent literature on the topic, research data were collected. These data sources were analyzed through the use of Betz and Hackett's (1989) self-efficacy theory. Data indicated that students with low self-efficacy often perform poorer in grade based performance and the contrary is true for students with high self-efficacy. Findings suggest that improving a student's math self-efficacy develops performance in the classroom.

Poster Presentation ES

EVALUATING EDUCATION WITHIN DISCIPLINARY ALTERNATIVE EDUCATION PROGRAMS AND JUVENILE DETENTION CENTERS

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According to the National Center for Juvenile Justice, an average of 71,000 adolescents reside in juvenile detention centers on any given day. Disciplinary Alternative Education Programs (DAEPs) and juvenile detention centers in the United States are struggling to educate adolescents properly in order to reduce recidivism and encourage academic achievement. The purpose of this study was to examine the educational system within DAEPs and to find a solution for the increasing rate of recidivism and delinquency among juveniles. Through the analysis and review of 10 current research articles, the study highlighted the importance of quality education for students within DAEPs. Findings support previous research that showed increased rates of literacy and mathematic skills decrease criminal behavior. I suggest closer relationships between students and teachers to create a more consistent educational environment, increasing the success of adolescents outside of these programs, thereby reducing the numbers of juveniles remaining in detention centers.

Poster Presentation ES

HOW CHEMISTRY STUDENTS LEARN IN AN INQUIRY-BASED CLASSROOM

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Inquiry-based learning (IBL) provides an excellent opportunity for students to develop their *habits of mind* (Llewellyn, 2005). Habits of mind are described as mental habits that are developed to render students' thinking. These include skills in higher-order thinking, critical reasoning, problem-solving, communication and decision making, and metacognition. This research study investigated how chemistry students in an urban high school learn in an inquiry-based classroom. Six inquiry-based lessons were implemented throughout the course of four weeks. Reflections were written after each lesson to assess students' learning. Student work and lesson plans were also analyzed throughout this study. The qualitative data were analyzed using Marchlucz and Wink's (2011) Active Model of Inquiry Framework. Results support that IBL allows students to think more critically about concepts, as well as be more engaged in the lessons.

Poster Presentation ES

**CHALLENGING THE CURRENT CURRICULA: A LOOK INTO
INDIVIDUALIZING TEACHING**

Caroline McMahon and Sumer Seiki*

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In many school districts in the United States, teachers are expected to follow a strict classroom curriculum, created by the administration, state, or other groups rather than the teachers. Many teachers have reported facing struggles associated with following this type of mandated curriculum. Some teachers need guidance and don't have the time or resources to be able to create a curriculum on their own, while others know their students best and feel having a mandated curriculum may prevent some students from being able to learn. My paper will explore the benefits and drawbacks of the mandated curricula currently in use. My findings suggest it is beneficial to have a set curriculum to ensure all students receive equal chances to excel and gain the proper knowledge for their grade level, but will also allow the teachers to have flexibility adjusting their curriculums to scaffold to the individual needs of their students.

Poster Presentation ES

INCORPORATING SONG AND PNEUMONIC DEVICES INTO LEARNING A FOREIGN LANGUAGE

George Mitchell and Jeanne Koehler*

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Teachers of foreign language often use strict drill tactics with students. In order to better engage and motivate my students to achieve high results when acquiring the French language, I focused on incorporating authentic French music and pneumonic devices. This study was completed using a qualitative self-study approach and included varying data collection methods such as finding popular French music, talking with French native speakers, collecting student work, and gathering student opinions on music. I discovered using music within lessons engages students in the language of French, creates a personal and meaningful connection for students with the language, and builds upon the universal appeal of music. In addition, pneumonic devices help students learn important concepts and commit them to memory. I found the power of rhyme is greater than spoken word alone. For teachers of a foreign language, this study provides support for using pneumonic devices and music in the target language within the classroom. In the future, I will continue to incorporate the use of authentic music and pneumonic devices within the lessons.

Poster Presentation ES

USING HANDS-ON ACTIVITIES AND MANIPULATIVES IN KINDERGARTEN

Sarah Pierpoint and Leah Nillas*

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This is a study exploring how hands-on activities, including the use of physical and virtual manipulatives, facilitate students' learning. The research was conducted during a student teaching semester in a rural elementary school, specifically in a Kindergarten classroom. There were sixteen students in the classroom, all between the ages of five and six years old. Three major data sources were analyzed: photographs, sample student work, and teacher journals. Photographs were content analyzed and students' work and teacher journals were analyzed using Glaser and Strauss's (1967) Grounded Theory. Additional supplemental data sources included student verbal responses and lesson plans. Students' participation, engagement, collaboration, and performance were emerging themes from the data analysis. Findings support that hands-on activities have positive influence on students' learning when supplemented with other teaching practices.

Poster Presentation ES

**ADDRESSING STUDENTS' ANXIETY LEVELS IN A HIGH SCHOOL
MATHEMATICS CLASSROOM**

Robert Rachford and Leah Nillas*

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In our ever-changing world, the use of technology is at all-time high. With the advent of our new technologies come new jobs and opportunities based on an education in mathematics and science. Now, more than ever we should be seeing an increase of students who enter college with a degree focused in these areas. Instead we are seeing little growth in these fields and anxiety is to blame.

This self-study was conducted to understand the ways in which: assessment, goal setting, teaching style, and technology affect student's anxiety levels in mathematics. The study was conducted in an urban high school. Questionnaires, teacher journals, and lesson plans were analyzed. Students were asked to rate their anxiety levels during different classroom activities. Students were also asked what type of teaching styles, goals, technology use and assessments raised or lowered their anxiety levels. Several of these items were found to affect students anxiety levels in varying ways.

Poster Presentation ES

**DIFFERENTIATING READING:
ONE TEACHER'S JOURNEY IMPLEMENTING LITERATURE CIRCLES**

Jenifer Rank and Robin Leavitt*

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For this self-study, I developed and implemented a literature circle unit in a fourth grade classroom using Roald Dahl books at a variety of reading levels during the three weeks of my full time student teaching. The goal of this study was to use a literature circle format as a means to reach the needs of all students with varying degrees of reading abilities and styles of learning. I collected data in the form of student work, student journals, video taped conversations with students, and my own field notes. By considering the journey of three specific students, an advanced student, a student performing at grade level, and a low performing student, I found literature circles were especially useful for reaching the needs of all students. The results highlight the importance of using a differentiated reading program, with literature circles as one such format.

Poster Presentation ES

**THE UNTOLD HISTORY IN TEXTBOOKS: THE BIAS AND ABSENCE OF HISTORY
IN U.S. HISTORY TEXTBOOKS AND THE IMPACT ON BLACK STUDENTS**

Stephen Rudnicki and Summer Seiki*
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The purpose of this literature review is to recognize the shortcomings of history textbooks in secondary education and discover how to bring change to history classrooms. The main problem with history textbooks is the amount of pertinent information that is simply not included within the text. In today's society, a lot of African American history is left out of textbooks and this makes it difficult for black students to make meaningful connections to the material, while also decreasing their interest in learning about history. The findings show how alternative teaching methods can effectively include more African American history which, and as a result these efforts can increase African American students' interest in history overall. This research is important because teachers, administrators, and parents can see how controlling history affects students in today's classrooms and how it can impact students in future classrooms as well.

Poster Presentation ES

CALCULATING AN APPROACH TO DIFFERENTIATION IN MATH

Emily Schimick and Robin Leavitt*

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Upon determining the needs of the students in a second grade classroom during my student teaching, I embarked upon a self-study about how I could differentiate my instruction in elementary mathematics. I set out to discover which instructional strategies I could implement in the classroom to ensure that every student felt appropriately challenged, motivated, and interested in mathematics. I incorporated a variety of manipulatives, math games, and group activities, among other methods, to engage students in mathematics. The photographs and field notes I took during daily activities- along with student work and test data- indicated that students enjoyed mathematics when concepts were presented in a variety of manners. This often led to noticeable improvements in students' math skills. This study expanded my understanding of the instructional methods that enhance student enjoyment and comprehension in mathematics.

(135 words)

Poster Presentation ES

GLOBAL EDUCATION THROUGH CHILDREN'S LITERATURE

Emily Schmidt and Robin Leavitt*

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In this study I examined multicultural education and global education. Today, children live in a global society, thus it is necessary to provide them with meaningful learning experiences that familiarize the belief systems, values, and history of cultures and countries from around the world. A review of literature explores implications and effects that the curriculum had on students and its practical uses in everyday instruction. My focus of the study evolved to encompass the use of children's literature as an instructional tool for global education. I discovered the crucial role that children's literature plays in a student's emotional, social and academic development. This genre of Children's literature helps students make tangible sense of unfamiliar global concepts through stories and illustrations that generate classroom discussion, serve as a safe setting for the exploration of social and moral issues, and allow students to picture the world from the perspective of another.

Poster Presentation ES

INTEGRATION OF FINE ARTS IN A WRITER'S WORKSHOP

Amanda Stoeke and Robin Leavitt*

Educational Studies Department, Illinois Wesleyan University

I implemented a creative writer's workshop as my self-study inquiry during my student teaching experience in a second grade classroom in response to the absence of a structured writing program. This six-week program utilized music and visual arts as brainstorming tools in an effort to learn how a creative writer's workshop might influence students' writing, attitudes towards writing, and classroom community. Data collection included student work samples, field notes, student interviews, and videos. Analysis of this data leads me to conclude that through the inclusion of fine arts in writing, a community of inspired writers is created and creativity of student stories is also increased, based on comparisons to student work done prior to this study. The results highlight the positive effects both fine arts and a writer's workshop have in the classroom, such as increased student interest, more detailed writing, and the formation of positive peer relationships.

Oral Presentation ES

**BRIDGING THE DIVIDES: CREATING A SAFE AND COLLABORATIVE
CLASSROOM FOR DIVERSE STUDENTS**

Mary Tackett and Sumer Seiki*

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Despite the diverse student populations in our schools, students of difference races and cultures are not interacting (LeClair et al., 2009; Pappamihel, 2002; Tatum, 1997; Yoon, 2008). This literature review identifies how future teachers can create classrooms that foster relationships between these diverse students. Through analyzing recent education and psychology journal articles, I found that teachers can serve as mediators and create connections between diverse students through pedagogical, attitudinal, and classroom procedures. The lack of interracial collaboration between students is a loss or potential meaningful relationships; if students cannot learn to respect and work with one another in school, they will not be able to work together in this growing global economy.

Poster Presentation ES

**ACTIVITIES IN THE MATHEMATICS CLASSROOM THAT
PROMOTE MATHEMATICAL FLUENCY**

Sevasti Tagaris and Leah Nillas*

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Mathematics, in and of itself, is a language— reading notations, writing solutions, and communicating explanations. The importance of developing mathematical fluency is frequently overshadowed by an emphasis on implementation of memorized formulas in mathematics classrooms. The National Council of Teachers of Mathematics (NCTM) has recognized the relevance of using mathematics as a language as early as 1989 and promotes learning to communicate mathematically as a major goal for students. Hufferd-Ackles, Fuson, and Sherin (2004) recognize the importance of *a math-talk community* in the classrooms to encourage students' understanding of mathematics. This self-study focuses on the advantages of writing, reading, and speaking mathematics in students' learning. It is conducted the study in two Algebra II classes at a rural high school in Central Illinois. Different activities, students' work, and analyzed personal reflective journals are content analyzed to draw conclusions on the ways these instructional activities promote mathematical fluency and mathematical understanding.

Poster Presentation ES

WHAT WE SEE AND WHY IT MATTERS: HOW COMPETENCY IN VISUAL LITERACY CAN ENHANCE STUDENT LEARNING

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In today's world, we use more visuals than ever before. Research suggests that the balance between words and images has shifted considerably calling for new forms of literacy (as cited in Brumberger, 2011). Visual literacy goes above and beyond the traditional concepts of reading and writing, expanding literacy to include visuals. The analysis and review of current visual literacy research suggests teaching visual literacy is necessary for students to become capable of navigating the visually driven world we live in today. The research highlights the importance of incorporating visuals into the literacy curricula, and explores practical uses of visual literacy in present day society. Findings suggest that the ability to create images will help students better learn to decipher, understand and communicate with images. If there is a better understanding of how and why visuals are developed, then the use of visuals can become more effective, ergo enhancing student learning.

Poster Presentation ES

TEACHING WITH TECHNOLOGY IN A 2ND GRADE CLASSROOM

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Today technology is becoming increasingly common in educational environments. In the past decade, integrating SmartBoards into classrooms all over the world and incorporating SmartBoards into the daily curriculum has become a focus of many educators. The purpose of this research is to determine how technology aids students to learn concepts and skills.

This self-study was conducted in a second grade classroom in an urban, low-income elementary school. Student work, teacher journals, and recent literature served as data for this study. Mishra and Koehler's (2006) TPACK (Technological, Pedagogical, and Content Knowledge) Framework was used in analyzing these qualitative data.. Data showed that technology integration facilitated students' learning of concepts and skills. This research provides educators with an overview of how SmartBoards can be integrated in an elementary classroom.

Poster Presentation ES

INCLUDING THE INTERACTIVE WHITE BOARD IN A CLASSROOM

Andrew Werkema and Leah Nillas*

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In the last decade, a new technology has started to make its way into countless classrooms around the world. This technology is the Interactive White Board (IWB) system. This self study project shows ways a teacher can integrate the IWB technology in an elementary school classroom. This study was conducted in a first grade classroom in an urban area through analyzing lessons, student work, and teacher journals. The lessons that were taught all included the use of an IWB in different ways, including viewing of online sources, accessing curriculum materials, providing interactive materials, documenting student or teacher work, modeling, and creating opportunities for students to be active learners. I found that the IWB is an effective tool in both delivery of materials during lessons and assessment.