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John Wesley Powell Student Research
Conference

2014, 25th Annual JWP Conference

Apr 11th, 4:00 AM - Apr 12th, 3:00 PM

Complete 2014 Program

Illinois Wesleyan University

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Center for Natural Sciences
& The Ames Library

Friday & Saturday
APRIL 11-12
2014

<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-Fifth Annual
John Wesley Powell • IWU

Student Research Conference

Center for Natural Sciences and Ames Library

Friday, April 11, 2014
&
Saturday, April 12, 2014

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 of Information Technology Services in setting up computer equipment in all rooms along with Ann Aubry and Michael Gorman for registration and website consultation is greatly appreciated.

John Wesley Powell Research Conference Committee:

- David Vayo (Music)
- Leah Nillas (Educational Studies)
- Stephanie Davis-Kahl (Library)
- Edgar Lehr (Biology)
- Michael Seeborg (Economics)
- Chris Callahan (French)
- Tao Jin (Religion)

SCHEDULE OF EVENTS

Friday, April 11, 2014

| | | |
|--------------------------|--|------------------|
| 4:00 p.m. – 7:00 p.m. | Educational Studies – Poster Session and Oral Presentations | The Ames Library |
|--------------------------|--|------------------|

Saturday, April 12, 2014

| | | |
|----------------|---|------------------------------|
| 8:30 a.m. | Continental Breakfast and Poster Setup | Atrium of CNS |
| 9:00 a.m. | Poster Session A | Atrium of CNS |
| 10:00 a.m. | <i>Oral Presentations – Session One</i> | CNS |
| 11:00 a.m. | <i>Oral Presentations – Session Two</i> | CNS |
| 12:15 p.m. | Luncheon | Young Main Lounge |
| | Music Composition Performances | |
| | Keynote Address: Paul Black | |
| 2:00–3:00 p.m. | Poster Session B | Atrium of CNS |
| 2:00–3:00 p.m. | Senior Art Show and Critique | Merwin and Wakeley Galleries |

KEYNOTE SPEAKER

**“The Long Road to Exciting Results: New Discoveries in
DNA Charge Transport.”**

Paul Black, Postdoctoral Research Fellow in Translational Radiation Oncology,
Wake Forest Baptist Health

As a researcher at Wake Forest University, Paul Black's training crosses physics, biology, and chemistry, focusing on radiation chemistry. Black attended the College of William and Mary from 2003-2007 and earned a Bachelor of Science degree, with honors, majoring in Physics. At William and Mary he pursued honors research in magnetic resonance under the supervision of Professor Todd Averett. After graduating from William and Mary, he began his graduate education at the University of Rochester in the summer of 2007. He pursued research in ionizing radiation damage to DNA and protein, using magnetic resonance techniques to characterize free radicals in organic molecules under the supervision of Professor William Bernhard. He received his Master of Science degree in Biophysics from the University of Rochester in March, 2009. The author has been invited to speak at five separate conferences, with subjects ranging from DNA nano-filtration to charge transport properties of DNA to the possible influence of ionizing radiation on the origin of life on Earth. He has received multiple travel awards to attend conferences both within the United States and abroad. In 2007, he received the University of Rochester's Deans Award. In 2011, the author received the William F. Neuman Award and was awarded the Neuman Biophysics Travel Grant to attend the International Congress of Radiation Research meeting in Warsaw, Poland. He was the Biophysics and Structural Biology student representative from 2009 to 2010 and was on the organizing committee for the BSB retreat in 2010. In addition, the author has served as a session chair at the Radiation Research Society meeting in 2010. He had the honor of serving as the chair of the Gordon Research Seminar on Radiation Chemistry in July, 2012.

STUDENT PARTICIPANTS

Oral and Poster Presentations

| | | | |
|---------------------|-------------|--------------------|---------|
| Genevieve Alexander | P1 | Jonathan Gholson | P19 |
| Cassandra Anderson | ES | Mark Giannis | O4.2 |
| Samuel Aronson | P2, P3 | Allison Gibson | P20 |
| Callie Ault | ES | Jamie Gradishar | P8 |
| Lindsey Bakewell | ES | Meghan Gradle | P21 |
| Josefina Banales | O6.2 | Chelsea Green | O6.1 |
| Alexandra Bechtel | O10.1 | Baylie Gregurich | ES |
| Ben Becker | P4 | Molly Guenette | O7.3 |
| Nicole Bialeschki | O6.3 | Aaron Guenther | ES |
| Jennifer Bjorklund | P5 | Victoria Halevy | P22, ES |
| Jennifer Black | O3.3 | Paige Hasty | P23 |
| Jennifer Boll | P6, O7.1 | Aubrey Hayes | O5.3 |
| Cecilia Boyd | P7 | Casie Henrikson | P2, P3 |
| Rachel Branson | O13.3 | Christopher Jent | P24 |
| Kevin Brown | O1.1 | Devonte Jones | O12.1 |
| Abigail Brown | P8 | Antonia Jurkovic | P25 |
| Emily Brown | P9 | Jaret Kanarek | O4.3 |
| Danielle Burge | ES | Melissa Kinsella | O12.2 |
| Andrea Cain | ES | Jason Kotecki | O4.4 |
| Jennifer Carter | P8 | Shelby Kottemann | ES |
| Patrick Cavanaugh | O1.2 | Daniel Krob | P9 |
| Sidhartha Chaudhry | P10 | Joseph Krob | P26 |
| Athena Cocallas | ES | Alexander Lang | P27 |
| James Connolly | P9 | Nicholas Lazzara | P26 |
| Matthew Conrad | ES | Jiwon Lee | P28 |
| Ellen Cornelius | O8.2 | Colleen Leonard | P29 |
| Nicholas Desideri | O3.1 | Kali Lewis | P2, P3 |
| Hannah Dhue | O9.1 | Derek Lindgren | O10.2 |
| David Dickinson | P11 | Manish Mandava | P30 |
| Huy Do | P12 | Emil Maric | P14 |
| Nathaniel Douglas | O5.1, O11.1 | Paige Maurer | P20 |
| Tara Drazner | ES | Michael Mayberger | O4.1 |
| Jenna Ducharme | O7.2 | Katelyn McDonald | O7.4 |
| Jeremy Duffee | O3.2 | Colleen Melone | O13.2 |
| Kaitlin Dunn | P13 | Nickolas Miller | P24 |
| Jessica Edwards | P14 | Brenda Miller | P31 |
| Kaitlyn Eichinger | P15 | Alexandra Mitchell | P32 |
| Annika Ewaldz | O13.1 | Jason Murphy | P33 |
| Justin Feng | P16 | Patrick Nevels | O8.3 |
| Melissa Fuesting | O6.4 | Linh Nguyen | P34 |
| Yizhe Gao | P17 | Tung Nguyen | O2.1 |
| Tyler Gedvilas | P18 | Lauren Nielsen | P35 |
| Ethan Gelke | P2 | Kyle Nottingham | P26 |

THE JOHN WESLEY POWELL STUDENT RESEARCH CONFERENCE - APRIL 2014

| | | | |
|---------------------|-----------|-------------------|--------|
| Joseph O'Brien | O9.3 | Erica Vrkljan | ES |
| Colleen O'Connor | P36, O1.3 | Erin Wachtel | O10.4 |
| Brendan O'Donnell | P16 | Amanda Watts | ES |
| Brady Olson | ES | Kimberly Wenger | O2.3 |
| Leonard Onsen | P37 | Victoria Whitaker | P51 |
| Ryan Orloski | P8 | Sarah Whitchurch | P2, P3 |
| Shivum Patel | P8 | Inez White | P2, P3 |
| Stephanie Patton | P38 | Abigail White | P27 |
| Cristina Petcu | O10.3 | Stephen Whitfield | P50 |
| Kyle Pfister | ES | Kristen Woodside | ES |
| Anh Phan | O2.2 | Brianna Yarwood | ES |
| Nicole Pierce | O12.3 | Rachel Zarchy | P14 |
| Brianna Piro | P14 | Ruomeng Zhang | P52 |
| Kelsey Quitschau | ES, P39 | Xuewen Zhou | P53 |
| Joseph Richards | P40 | | |
| Kathryn Robinette | ES, O5.4 | | |
| Anjelica Rodriguez | P42 | | |
| Kevin Roenitz | O8.1 | | |
| Roberto Romay | P44 | | |
| Kathryn Rothas | O5.2 | | |
| Julia Savich | P40 | | |
| Alexander Scherer | P9 | | |
| Stephanie Schwingle | P45 | | |
| Rahul Shrikanth | P23 | | |
| Ian Simmons | P9 | | |
| Matthew Simon | ES | | |
| Megan Smeets | P23 | | |
| Elizabeth Smith | ES, P46 | | |
| Ryan Smith | ES | | |
| Tia Sprengel | O1.4 | | |
| Chloe Staub | P47 | | |
| Tyler Sterr | P22 | | |
| Julieanne Sthay | ES | | |
| Mark Swanson | P33 | | |
| Ethan Szpara | O11.2 | | |
| Christopher Tatara | O3.4 | | |
| Jakeshan Thaker | P9 | | |
| Kathryn Thomas | P48 | | |
| Brynn Tomko | ES, O11.3 | | |
| Caitlyn Trevor | O9.2 | | |
| Kristin Ullberg | P23 | | |
| Cathryn Volk | P49 | | |

**BA/BFA SENIOR EXHIBITION PRESENTATIONS
SCHOOL OF ART**

Saturday, April 12, 2014, 2:00 p.m., Merwin and Wakeley Galleries

Student Presenters:

Rebecca Ebben

Joseph O'Brien

Victoria Palacios

Refreshments will be served

MUSIC COMPOSITION STUDENT PRESENTATIONS

Saturday, April 12

12:15 p.m.

**Young Main Lounge, Memorial Student Center
(as part of the conference luncheon program)**

from Partita in A minor
The Train to Brno

Christopher Grills '14

from Suite in G major
The Gavotte of Delicious Anticipation

Christopher Grills, piano

English Horses

Joseph Bakke '16

Joseph Bakke, piano, vocal

from Prague
II. Alchemy

Caitlyn Trevor '14

David Flowers, flute
Eric Novak, oboe
Mark Timmerman, violin
Madz Negro, viola
Elena Denny, cello
Joseph Bakke, marimba

Music Performance

SELECTIONS FROM PIECES DE CLAVECIN

Christopher Grills and David Vayo*
School of Music, Illinois Wesleyan University

Soon after I came to Illinois Wesleyan as a Piano Performance major, I discovered a beautiful harpsichord that Minor Myers, Jr. had purchased for the university in 1993. I fell in love with the instrument, and realized that I had been playing the wrong keyboard instrument the whole time. I have now been accepted to a number of prestigious schools for graduate studies in Historical Performance, but as a composer I have also been interested in new music for the harpsichord. Since there was little to no interest at the university in composing for the harpsichord, I composed and arranged 20-30 individual pieces during my four years here specifically idiomatic to the harpsichord (e.g. not playable on the piano, organ, etc.). These works collectively form a group appropriately named after similar collections by French composers of the 17th and 18th centuries – Pieces de Clavecin. You will likely hear two short compositions from this collection at the conference.

Music Performance

ENGLISH HORSES

Joseph Bakke and David Vayo*
School of Music, Illinois Wesleyan University

English Horses is a neo-romantic work for piano and voice that combines aspects of late-romantic piano genres with the songs of Cole Porter and other turn-of-the-century songwriters. The harmonic aspects of the piece were inspired by the piano works of Franz Liszt and Johannes Brahms while the formal and lyrical structures are more related to modern songwriting. The purpose of this combination of seemingly different genres is to blend the lines of classical piano idioms and modern songwriting composition in a way that can be relatable to a wider audience.

Music Performance

“PRAGUE” mvt. 2, “ALCHEMY”

Caitlyn Trevor and David Vayo*
School of Music, Illinois Wesleyan University

“Prague” is a collective work containing a three-movement composition, three dance costumes, and three solo dances all inspired by my time abroad in the Czech Republic, February – May, 2012. While there, I learned a great deal about the history of the country from an arts perspective. Each movement focuses on a different aspect of their history as well as my personal experiences living there. This movement, “Alchemy,” is inspired by both the Czech Republic during the National Revival and the long Czech tradition of alchemy. The golden age of alchemy, during the 16th century, was long before the National Revival in the 18th and 19th century. However, the strong creative energy of the National Revival resonates well with the chemical energy of alchemy. The many themes and the every-changing quality of this piece are inspired by these chemical qualities that alchemy implies. Throughout these themes, I strived to keep a line of energy flowing throughout the entire piece to reflect the incredible creative vitality and drive of the National Revival. The color pallet for the costume design contains reds, oranges, and gold to connect to alchemy’s goal of turning metals into gold as well as to match the lively ingenuity and pride of the National Revival.

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

- 1.1 Kevin Brown (English)
- 1.2 Patrick Cavanaugh (English)
- 1.3 Colleen O'Connor (English)
- 1.4 Tia Sprengel (English)

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

- 2.1 Tung Nguyen (Mathematics)
- 2.2 Anh Phan (Mathematics)
- 2.3 Kimberly Wenger (Mathematics)

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

- 3.1 Nicholas Desideri (International Studies)
- 3.2 Jeremy Duffee (Political Science)
- 3.3 Jennifer Black (History)
- 3.4 Christopher Tatara (History)

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

- 4.1 Micheal Mayberger (Business Administration)
- 4.2 Mark Giannis (Economics)
- 4.3 Jaret Kanarek (Economics)
- 4.4 Jason Kotecki (Economics)

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

- 5.1 Nathaniel Douglas (Hispanic Studies)
- 5.2 Kathryn Rothas (Hispanic Studies)
- 5.3 Aubrey Hayes (Hispanic Studies)
- 5.4 Katie Robinette (Hispanic Studies)

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

- 6.1 Chelsea Green (Anthropology)
- 6.2 Josefina Banales (Sociology)
- 6.3 Nicole Bialeschki (Sociology)
- 6.4 Melissa Fuesting (Psychology)

ORAL PRESENTATIONS - SESSION 7
11:00 – 12:00 NOON
CENTER FOR NATURAL SCIENCES (E101)
MODERATOR: Ashley Tegge

- 7.1 Jennifer Boll (Nursing)
- 7.2 Jenna Ducharme (Nursing)
- 7.3 Katelyn McDonald (Nursing)
- 7.4 Molly Guenette (Nursing)

ORAL PRESENTATIONS – SESSION 8
11:00 – 12:00 NOON
CENTER FOR NATURAL SCIENCES (E102)
MODERATOR: Tom Sobyra

- 8.1 Kevin Roenitz (Chemistry)
- 8.2 Ellen Cornelius (Environmental Studies)
- 8.3 Patrick Nevels (Computer Science)

ORAL PRESENTATIONS - SESSION 9
11:00 – 12:00 NOON
CENTER FOR NATURAL SCIENCES (E103)*
MODERATOR: Victoria Palacios

- 9.1 Hannah Dhue (Theatre Arts)
- 9.2 Caitlyn Trevor (Music)
- 9.3 Joseph O'Brien (Art)

*First two presentations are in E103 and then audience walks to Art Gallery for the third presentation.

ORAL PRESENTATIONS - SESSION 10
11:00 – 12:00 NOON
CENTER FOR NATURAL SCIENCES (E104)
MODERATOR: Junru Zhao

- 10.1 Alexandra Bechtel (Economics)
- 10.2 Derek Lindgren (Economics)
- 10.3 Cristina Petcu (Economics)
- 10.4 Erin Wachtel (Economics)

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

- 11.1 Nathaniel Douglas (Hispanic Studies)
- 11.2 Ethan Szpara (Hispanic Studies)
- 11.3 Brynn Tomko (Hispanic Studies)

ORAL PRESENTATIONS - SESSION 12
11:00 – 12:00 NOON
CENTER FOR NATURAL SCIENCES (E106)
MODERATOR: Emma Peck

- 12.1 Devonte Jones (Sociology)
- 12.2 Melissa Kinsella (Sociology)
- 12.3 Nicole Pierce (Sociology)

ORAL PRESENTATIONS - SESSION 13
11:00 – 12:00 NOON
CENTER FOR NATURAL SCIENCES (E108)
MODERATOR: TBA

- 13.1 Annika Ewaldz (German and Russian)
- 13.2 Colleen Melone (Greek and Roman Studies)
- 13.3 Rachel Branson (Literature and Culture)

Presentations are 12-15 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

**MOVIN' ON UP: SODOMY IN SERVICE IN
*THE WHITE DEVIL***

Kevin Brown and Joanne Diaz*

English Department, Illinois Wesleyan University

Renaissance England was marked by change. From the late 15th century through the early 17th century, the social atmosphere in England was thrown out of order. The rise of the middle class gave people money who weren't supposed to have money. This deteriorated the established hierarchies of the time, blurring the lines between classes. Critics of John Webster's *The White Devil* (1612) have yet to address these issues in conjunction with the homoerotic tones throughout the play. Webster is using sodomy as a trope to illuminate how mobility in service is a destructive, chaotic force. By exploring these concepts together, readers can gain a better understanding of the play's portrayal of these social anxieties and their meanings.

Oral Presentation O1.2

CYCLES OF VIOLENCE IN THE SHORT STORY CYCLE

Patrick Cavanaugh and Brandi Reissenweber*
English Department, Illinois Wesleyan University

My project is a collection of short fiction that examines how decisions have consequences in other lives, other stories, and how cycles of violence are created and perpetuated. The short story cycle includes stories I have already written at Illinois Wesleyan and four new stories. It includes an accompanying analysis that looks at how my work compares to other interconnected story universes, such as those created by James Joyce, Sherwood Anderson, Jennifer Egan, and H.P. Lovecraft. Additionally, I analyze the themes created in my work and defend how they can only come about through the short story cycle form in which I chose to work. This project gives me the opportunity to create a significant, meaningful body of work and consider its greater themes and place in the literary world.

Oral Presentation O1.3

THANK YOU FOR CALLING

Colleen O'Connor and Michael Theune*
English Department, Illinois Wesleyan University

For this oral presentation, I will read a series of original poems from my Research Honors project in English Writing. My project focuses on my work at a local crisis hotline, where I regularly speak with nameless, disembodied callers in desperate need of a supportive listener, a friendly voice, or emergency suicide intervention. In this series of poems, I echo on the stark honesty of my callers' confessions and reflect upon my own years of loneliness, depression, and contemplated suicide. The resulting work intimately explores the nature of connection, family, hope, and the power of confessional poetry to provide a voice to those who feel trapped in silence.

Oral Presentation O1.4

**“DRAW YOUR SWORDS AND SHEATH THEM NOT”:
FEMINIZATION AND THE FALL OF EMPIRE IN
SHAKESPEARE’S *TITUS ANDRONICUS***

Tia Sprengel and Joanne Diaz*

English Department, Illinois Wesleyan University

In a society as hierarchical and misogynist as early modern England, it seems logical to assume that gender roles were relatively rigid. However, the reality of Renaissance England more often than not fell short of this ideal; seeing a woman wearing breeches or a man donning a dress was not all together uncommon, especially at the theatre. In his tragedy *Titus Andronicus*, William Shakespeare plays upon the unease surrounding this early modern gender-bending, specifically the intense fear of and anxiety surrounding feminization and the feminine. In *Titus*, Shakespeare uses the castration and penetration of Titus to articulate the fear of feminization and, at the same time, uses the mutilation and rape of Lavinia to illustrate the fear of the feminine and of feminine penetrability. These two anxieties coalesce and result in the fall of Rome in *Titus*, just as early modern individuals believed that they would result in the destruction of England.

Oral Presentation O2.1

CONSTRUCTION OF SPLINE TYPE ORTHOGONAL SCALING FUNCTIONS AND WAVELETS

Tung Nguyen and Tian-Xiao He*

Mathematics Department, Illinois Wesleyan University

In this talk, we present a method to construct orthogonal spline-type wavelet. B-spline functions have several useful properties such as compactly support and refinement relationship. However, except for the case of the first order, B-splines of order greater than one are not orthogonal. To induce the orthogonality while keeping the properties of B-splines, we use a class of polynomial function factors to transform the original B-splines to a spline-type orthogonal compactly-supported and refinable scaling functions in L_2 . In this paper we establish the existence of this class of polynomial factors and their construction. In addition, the corresponding spline-type wavelets and the decomposition and reconstruction formulas for their Multi-Resolution Analysis (MRA) are given.

Oral Presentation O2.2

BUS ROUTE METHOD AND ISOMORPHISM

Anh Phan and Daniel Roberts*

Mathematics Department, Illinois Wesleyan University

Two simple graphs, G and H , each of which have n vertices (with n a positive integer greater than 3) are called a graph pair of order n if the following three conditions all hold: (1) G and H union to the complete graph, (2) G and H have no isolated vertices, and (3) G is not isomorphic to H . Graph pairs of order 4 and 5 have been classified. This research took a step further to find graph pairs of order 6. During the finding, I discover the Bus Route method to make sure two graphs are not isomorphic. Two graphs G and H are said to be isomorphic if there exists a bijection, f , between the vertices of G and the vertices of H such that for every pair of vertices u and v in $V(G)$, uv is an edge of G if and only if $f(u)f(v)$ is an edge of H . The Bus Route method is based on the definition of isomorphism.

Oral Presentation O2.3

IN PURSUIT OF THE RINGEL-KOTZIG CONJECTURE: UNIFORM K-DISTANT TREES ARE GRACEFUL

Kimberly Wenger and Daniel Roberts*
Mathematics Department, Illinois Wesleyan University

Graph labeling has been an active area of research since 1967, when Rosa introduced the concept. Arguably, the biggest open conjecture in the field is referred to as the Ringel-Kotzig conjecture, which states that all trees admit a graceful labeling. In this talk, we will give a bit of background on the problem, as well as present our own results. Namely, that a certain infinite class of trees (called uniform k -distant trees) admits a graceful labeling.

Oral Presentation O3.1

BAD ROMANCE: DOMINANT PARTY STATE PATRONAGE SYSTEMS IN THE ERA OF GLOBALIZATION

Nicholas Desideri and William Munro*
International Studies Program, Illinois Wesleyan University

While much scholarly attention has been paid to national political patronage systems, few works have fully examined how these systems interact with capital flow and commodity prices. Patronage systems that prop up dominant party states are experiencing new kinds of pressures both economic and cultural. Analyzing three dominant party states from the developing world – Mexico, South Africa, and India – will shed light on how preeminent developing dominant party states pivot in accordance to market-driven forces. As countries turn their attention outward to capitalize on the fruits of globalization, the essential dynamic between domestic patron-client relationships change. Do parties attempt to recoup power through centralization of carefully delegate responsibilities to lower levels of government? Research suggests that globalizing forces encourage states to centralize their benefits and welfare systems. It is also possible that pressure to privatize public commodity industries, like oil behemoth PEMEX in Mexico, pushes states to compensate for shrinking resources by increasing direct welfare transfers to citizens.

Oral Presentation O3.2

THE NEW ECONOMICS OF AMERICAN CITIZENSHIP: HOW INCOME INEQUALITY UNDERMINES NOTIONS OF AMERICAN IDENTITY

Jeremy Duffee and William Munro*
Political Science Department, Illinois Wesleyan University

This paper explores citizenship theory in the context of social exclusion and class status. Extensive scholarly work examines how various indicators - such as income and race - affect citizenship rights. While race and socioeconomic status have long been recognized as contributing factors to social exclusion, the extent to which these factors affect the ability to exercise citizenship rights remains insufficiently analyzed given the recent increase in income inequality and increased pressure on American welfare resources. Demonstrating that federal government policies have abetted global economic changes that favor the wealthy, the paper concludes that 1.) increased income inequality has undermined political equality and inclusion 2.) social framing of poverty blames the victim rather than circumstance. The combination of these factors undermines a common sense of 'Americanness'.

Oral Presentation O3.3

**“TRIBUTE TO A GREAT LADY”:
EXPLORING THE LIVES OF TWO INFLUENTIAL
BLOOMINGTON WOMEN**

Jennifer Black and Thomas Lutze*
History Department, Illinois Wesleyan University

Sarah Davis (1814—1879) and Hazle Buck Ewing (1850—1969) were both wealthy Bloomington, Illinois, women who lived in palatial homes and were well known in the area. Though both women married, they were largely independent women who exercised control over their households, employees, daily activities, and, for the most part, finances. However, while both Sarah and Hazle were widely known and respected for their compassion and charity in the community, there were clear differences in the manner in which they conducted themselves and in their principles. Sarah was against women voting, while Hazle was a staunch supporter of the women’s suffrage movement. Sarah gave of herself on a local and personal level, while Hazle funded and was involved in many national activism movements and philanthropic projects. An examination of the letters and other documents of these two influential women from Bloomington highlights the changes and similarities in the standard for independent Illinois women just a generation apart.

Oral Presentation O3.4

**THE UNKNOWN WAR: THE 1939 SOVIET- JAPANESE BORDER WAR
AND U.S. POLICY IN ASIA**

Christopher Tatara and Thomas Lutze*
History Department, Illinois Wesleyan University

The 1939 border war between the Soviet Union and Japan is often forgotten to history. While the Nazi invasion of Poland drew Europe into war, Japan and the Soviet Union clashed along their border on the other side of the world. This conflict between Japan and the Soviet Union did not go unnoticed by U.S. diplomats stationed in those countries. This presentation explores how the United States diplomatic community assessed the conflict between the Soviet Union and Japan in regard to the United States' geopolitical interests in the region. In particular, an examination of the correspondences of the State Department with its Ambassadors in Japan and the Soviet Union reveal how even as war was breaking out around the world, the U.S. attempted to maintain its policy of non-interventionism.

Oral Presentation O4.1

**HOW DO BOND SPECIFIC, FIRM SPECIFIC AND MACROECONOMIC
FACTORS INFLUENCE CHANGES IN CORPORATE
CREDIT SPREADS?**

Michael Mayberger and Elisabeta Pana*

Business Administration Department, Illinois Wesleyan University

The recession of 2008 showcased the critical role that the corporate bond market plays in providing firms with access to capital, a role reflected by a 300% increase in corporate bonds issued from \$600 billion issued in 2007 to \$1.8 trillion issued in 2012. In this study, I investigate the bond specific, firm specific and macroeconomic factors that explain the change in corporate credit spreads within the Consumer Staples industry between 2005 and 2013.

Oral Presentation O4.2

RELATIVE INCOME CONCERNS AND LABOR SUPPLY

Mark Giannis and Michael Seeborg*

Economics Department, Illinois Wesleyan University

Traditional economic research on the number of hours that one chooses to work depends largely on wage rates and total family income. However, more recent research in behavioral economics suggests that one's relative position in the community's income distribution could also affect hours worked. This paper investigates the effect of someone's relative income will have on their actual hours worked. Relative income is defined as how one's income compares to others within the same geographical region. Cross-sectional data from 2006 to 2013 is used from the Community Population Survey to estimate the traditional labor supply function with the addition of the relative income variable. A tobit model is used to determine how ones hours of work changes from changes in relative income. The results show no conclusive evidence for a significant effect of relative income concerns.

Oral Presentation O4.3

THE EFFECTS OF BACKGROUND FACTORS ON AFQT SCORES

Jaret Kanarek and Michael Seeborg*

Economics Department, Illinois Wesleyan University

The introduction of the National Longitudinal Survey of the Youth (NLSY) 1979 and 1997 cohorts made Armed Forces Qualifications Test (AFQT) score data widely available and has thus dramatically increased its use in academic research. Resultantly, there has been much debate regarding what factors most affect AFQT scores. The most common understanding of AFQT is that it is a measure of human capital skills, and that this is what the AFQT is a suitable proxy for. However, there is evidence to suggest that many background factors, e.g. race, sex, family socioeconomic status—have both direct and indirect effects on AFQT scores. For example, growing up in poverty can directly affect AFQT scores by limiting educational resources in the home, but childhood poverty can also have an indirect effect on AFQT scores because school quality tends to suffer in impoverished neighborhoods, which in turn affects AFQT scores. The purpose of my research is to measure some of the important direct and indirect pathways through which background factors affect AFQT scores. This research, then, can elucidate what the AFQT is a suitable proxy for by examining these pathways.

Oral Presentation O4.4

ESTIMATING THE EFFECT OF HOME COURT ADVANTAGE ON WINS IN THE NBA

Jason Kotecki and Robert Leekley*
Economics Department, Illinois Wesleyan University

What is the effect of home court advantage in the National Basketball Association (NBA)? Based on the Economic Theory of Professional Sports and the concept of shirking, teams should perform better at home than they do on the road. Descriptive statistics support this expectation. Therefore it is hypothesized that a home court advantage exists through the selected variables of attendance, field goal percentage, free throw percentage, fouls called by the referee, and days of rest. Following every NBA team and every game played over a three year span (2008-2011), this paper examines the probability of producing a win at home based on the aforementioned variables. Using a logit regression analysis, it is found that a home court advantage exists through attendance and performance-based variables, as well as through a referee bias.

Oral Presentation O5.1

Veni, vi, vaig vencer:
**DIFFERENCES OF SPANISH AND CATALAN DEVELOPMENT FROM
VULGAR LATIN AND THEIR RELEVANCE TODAY**

Nathaniel Douglas and Christina Isabelli*
Hispanic Studies Department, Illinois Wesleyan University

Catalan is a minority language that boasts less than ten million native speakers across Spain, Andorra, France, and Italy. Like Spanish, Catalan is a Romance language that evolved from Vulgar Latin. Through careful analysis of the two languages, one can identify both similarities and differences in the development of phonological, syntactic, semantic, and lexical systems of Spanish and Catalan. Through use of authentic target-language materials, this paper investigates such similarities and differences between the two languages. In doing such, this paper also explores possible future social and political implications of preservation of the Catalan language within the Spanish state.

Oral Presentation O5.2

**A COMPARISON BETWEEN FORMAL MEDICAL
SPANISH TERMINOLOGY AND THE TERMINOLOGY
USED BY LOW-INCOME HISPANICS**

Kathryn Rothas and Christina Isabelli*

Hispanic Studies Department, Illinois Wesleyan University

It has been observed by Illinois Wesleyan students enrolled in the Medical Spanish course that when translating for patients in a clinical setting one of the two situations can occur: 1) the Spanish-speaking patient will use terminology unrecognizable by the student when describing their conditions or symptoms; or 2) the student translator will use terminology taught in their Medical Spanish course to describe conditions, symptoms and treatment instructions, but the terminology is unrecognizable by the Spanish-speaking patients. This miscommunication between the translator and the patient can lead to lack of treatment adherence or improper diagnosis due to a misinterpretation of the information provided. The goal of this study is to try to identify words that Spanish-speaking patients commonly utilize when describing their medical conditions and symptoms or when receiving medical instructions in order to compare these to the words and phrases being taught to students participating in Medical Spanish courses. Patients who attend the Community Health Care Clinic in Normal, IL and require a translator during their appointments will be given an oral survey consisting of three parts: 1) Image identification; 2) Selecting the term that sounds correct or familiar; 3) Providing an oral description of a common medical condition. The results from this survey may provide concrete examples in which the formal medical terminology being taught in Medical Spanish classes and published in English-Spanish medical dictionaries does not match the colloquial terminology being used by patients in the doctor's office, thus providing a possible explanation for the lack of understanding between translator and Spanish-speaking patient despite the fact both are communicating with each other in Spanish.

Oral Presentation O5.3

LANGUAGE USAGE OF A SPANISH-SPEAKING PROFESSIONAL IN CENTRAL ILLINOIS

Aubrey Hayes and Christina Isabelli*

Hispanic Studies Department, Illinois Wesleyan University

Numerous studies have investigated the maintenance and loss of the Spanish language in urban areas of the United States with large Hispanic populations; however, studies of this nature have not been conducted in smaller cities with a large Spanish-speaking community. This study explores the language usage of a Spanish-speaking professional in Central Illinois to gain an understanding of the social and cultural factors that influence the maintenance or shift in language of the Latino population from Spanish to English. An ethnographic interview conducted with a Spanish-speaking professional is examined to understand patterns of language maintenance and shift as well as the social and cultural factors that impact the usage of the English or Spanish language. Conclusions of this study may provide information essential to understanding the factors behind the maintenance of Spanish, or shift to English, in Central Illinois.

Oral Presentation O5.4

CASE STUDY: THE USES OF CODE-SWITCHING AMONG ONE BILINGUAL SPANISH-SPEAKER IN CENTRAL ILLINOIS

Kathryn Robinette and Christina Isabelli*
Hispanic Studies Department, Illinois Wesleyan University

Many researchers have investigated the various uses of code-switching among bilingual Spanish-speakers in urban cities with large Hispanic populations; however, there are few studies carried out in rural areas that also have high populations of Spanish-speakers. This case study seeks to identify the purposes of code-switching based on the analysis of transcriptions of three, fifteen minute, informal conversations with bilingual speakers of a variety of ages led by one bilingual Spanish speaker in Central Illinois, similar to a study conducted by Valdés (1982). From this study, the results may indicate the purposes of code-switching, provide additional information about bilingual Spanish speakers in rural areas of the United States, and may assist in changing the attitudes of those who believe code-switching indicates a lack of proficiency in either language.

Valdés, Guadalupe. (1982). Social interaction and code-switching patterns: A case study of Spanish/English alternation. In Jon Amastae & Lucía Elías-Olivares (Eds.), *Spanish in the United States: Sociolinguistic aspects* (pp. 209-229). Cambridge: Cambridge University Press.

Oral Presentation O6.1

DIABETES AS A HEALTH INEQUALITY AMONG NATIVE AMERICANS

Chelsea L. Green and Rebecca Gearhart*
Anthropology Department, Illinois Wesleyan University

Native American populations have a disproportionately higher rate of diabetes than any other population in the world. This research will examine the knowledge, attitudes, and beliefs about diabetes among Native Americans based on qualitative data collection among Native Americans in Illinois and on an Indian Reservation in South Dakota. Data was collected through survey responses that will help gain insight into what Native Americans know and believe about prevention and onset of diabetes, and the attitudes that shape their management of the disease. Personal interviews of Native Americans that live on a reservation were conducted to obtain an in depth understanding of the historical and cultural perception of diabetes. The findings of this research suggest that there is a disconnect between the unique set of beliefs and attitudes of Native Americans with diabetes that should be addressed in future education, treatment, and prevention programs.

Oral Presentation O6.2

**THE SUSTAINED IMPACT OF IWU'S "ENGAGING DIVERSITY"
PROGRAM ON SENIORS' COLOR-BLIND RACIAL ATTITUDES**

Josefina Banales and Meghan Burke*
Sociology Department, Illinois Wesleyan University

This study utilizes a mixed-methods (quantitative and qualitative) approach to evaluate the long-term impact of IWU's Engaging Diversity Program on white students' color-blind racial attitudes. Survey data reveals that white students who participated in the program not only endorse fewer color-blind racial attitudes than they did before completing the program, but that they also have a more critical awareness of race than the control sample of non-Engaging Diversity students. Individual interviews with Engaging Diversity participants also reveal a link between these students' learned racial consciousness and their involvement as social justice leaders and advocates on campus. These findings are particularly significant given that IWU is dedicated to cultivating a socially aware and active campus climate. This program assessment, which is also grounded in scholarly research on racial attitudes and the role diversity interventions play in their maintenance, demonstrates how the Engaging Diversity program can serve as a model for other campus initiatives dedicated to meeting diversity and social justice goals.

Oral Presentation O6.3

**WOMEN AND THE GLASS CEILING IN PROFESSIONAL SPORTS:
CHALLENGES AND OPPORTUNITIES**

Nicole Bialeschki and Meghan Burke*
Sociology Department, Illinois Wesleyan University

Women continue to face a glass ceiling when attempting to work for all-male professional sports teams. As in other male-dominated fields, women struggle to find employment, and encounter a variety of gendered roles and consequences in their work. My research investigates the factors that impact their success, and the barriers that some women face along the way. I interviewed men and women who already work within the sports industry and surveyed Illinois Wesleyan University students about their opinions of working women. I found that women are moving closer to equality in the sports world, but that gender still shapes their opportunities and perceptions along the way.

Oral Presentation O6.4

COME ON DOWN: INVESTIGATING A STRATEGY TO DEBIAS THE ANCHORING HEURISTIC

Melissa Fuesting and Ellen Furlong*
Psychology Department, Illinois Wesleyan University

When an individual estimates the price of a good or service, a random number may affect the estimate due to the anchoring heuristic. When anchoring, numbers in individuals' surroundings remain within their minds and they subconsciously use the number, or anchor, as a starting point for their estimates of a numerical value, which then slants towards the anchor (Tversky & Kahneman, 1974; Chapman & Johnson, 1994). Research (Ariely, Loewenstein, & Prelec, 2003) shows anchored individuals may pay up to three times as much for a product and buy 32% more products (Wansink, Kent, & Hoch, 1998). Because anchoring affects purchases large and small, recent research investigates how to debias, or reduce the negative effects, of the anchoring heuristic. Successful debiasing strategies in the literature are not easily implemented outside the lab where anchoring affects daily purchasing decisions (Strack & Mussweiler, 1997; Chapman & Johnson, 1994; George, Duffy, & Ahuja, 2000). We thus investigated an intervention strategy we could apply in daily life with little disruption to an individual's daily routine but could reduce the negative effects of the anchoring heuristic.

Oral Presentation O7.1

**A MEASUREMENT OF NURSE VIGILANCE FROM
THE PATIENT'S PERSPECTIVE**

Jennifer Boll and Wendy Kookan*
School of Nursing, Illinois Wesleyan University

Problem: Since the landmark Institute of Medicine report, *To Err is Human*, was published in 1998, patient safety has become a major concern in healthcare systems. Although attention is being given to patient safety and preventing patient morbidity and mortality, experts indicate that little progress has been made in decreasing healthcare errors. Nurses are at the bedside twenty-four hours a day and are an important link in preventing patient healthcare errors. In an environment of patient centered care, patients are considered valued stakeholders that can help prevent healthcare errors by giving input. Vigilance is a phenomenon often identified in literature as a means to promote patient safety and well-being; however, little research has been conducted on the phenomenon of vigilance in healthcare. In one qualitative study, patients clearly watch for vigilance in nurses exhibited through a variety of behaviors. If patients can identify vigilance in nurses, then it is possible to examine relationships that may exist between vigilance and outcomes such as patient safety and well-being.

Purpose: The purpose of this study was to design a valid instrument that will measure nurse vigilance from the patient perspective.

Method: Three steps were completed to design the instrument: 1) A pool of items was developed from five domains of vigilance: knowledge, connectedness, hope, going beyond the call of duty, shared vigilance, and quality patient outcomes such as safety and quality of life. The subscales were derived from a qualitative study of patient-nurse experiences of vigilance and existing research literature. Twenty items were developed for each domain and then through card sorting the items were reduced to approximately 10 per domain to avoid repetition. 2) An expert panel, consisting of 8 professionals with knowledge about vigilance, quality, and safety was identified and will rate items for content validity. 3) A content validity index was developed to rate each individual item according to the expert analysis of its relevance to its domain of vigilance. The content validity index consists of a likert-type scale from 1-4, 1, not at all relevant to 4 very relevant. Experts will rate each item on this scale and the data will be analyzed to determine which items will be retained and which will be removed from the instrument. Items that are rated predominately as 3 or 4 are most often considered for retention.

Results: We are still in the process of collecting and analyzing the data at this time.

Oral Presentation O7.2

**EVIDENCE-BASED PRACTICE IN ACTION:
ASSURING CAREGIVER SATISFACTION IN PEDIATRIC
ASSESSMENT PROTOCOL CHANGES**

Jenna Ducharme and Ann Eckhardt*
School of Nursing, Illinois Wesleyan University

Background: Charting head-to-toe assessments requires valuable nursing time that could be spent providing direct patient care. Reducing the amount of charting through the reduction in frequency of head-to-toe assessments allows more time for direct care. Additional time for hands on patient care can increase nurse satisfaction.

Purpose: The purpose of this pilot study was to examine care provider satisfaction pre- and post-protocol change.

Methods: Student designed surveys were developed for this study and sent to care providers on the pediatric unit 2 weeks prior to the protocol change and again 6 weeks following implementation.

Results: Nurses reported that the amount of time spent charting took away from hands on patient care prior to the change. In an analysis of post-test results, nurses reported that the protocol change allowed them to spend more time with patients delivering direct, hands-on care. Physician results were insufficient to analyze.

Discussion: Overall, the protocol change yielded positive results for nurses; however, this research needs to be repeated in a hospital with a larger sample size. While data analysis of research indicates an increase satisfaction amongst nurses post-implementation, provider data was insufficient to analyze.

Oral Presentation O7.3

**IMPACT OF SCHOOL NURSE JOB SATISFACTION AND
HEALTH EDUCATION IN THE CLASSROOM ON STUDENT
HEALTH OUTCOMES**

Molly Guenette and Lisabeth Searing*
School of Nursing, Illinois Wesleyan University

School nurses have a large scope of practice (American Nurses Association [ANA] & National Association of School Nurses [NASN], 2011). However, school administrators often misunderstand, and therefore under appreciate, the school nurses' role (Junious, et al., 2004). In addition, few schools meet the 1:750 nurse to student ratio recommended by the NASN and the ANA (2011); high nurse to student ratios negatively affect school nurses' job satisfaction (Maughn & Adams, 2011). Several studies found that interventions by the school nurse positively impacted students (e.g., Bonaiuto, 2007; Denny, et al., 2012), while others have linked the presence of a school nurse with improved attendance (e.g., Pennington & Delaney, 2008; Telljohann, Dake, & Price, 2004). This study surveys nurses working at schools in Illinois, and adds to this body of research by examining the relationship between nurses' time spent on classroom health education and job satisfaction, as well as the impact of classroom education and their job satisfaction on student health outcomes.

Oral Presentation O7.4

EVIDENCE-BASED PRACTICE IN ACTION: ASSURING QUALITY OF PEDIATRIC ASSESSMENT INTERVALS

Katelyn McDonald and Ann Eckhardt*
School of Nursing, Illinois Wesleyan University

Background: Children comprise a specific, unique patient population. Nurses are responsible for head-to-toe assessment of each patient to allow full understanding of the patient's pathology. The optimal frequency of head-to-toe assessments for pediatric patients is unknown.

Purpose: The purpose of this pilot study was to monitor patient safety following the change in head-to-toe assessment frequency on an inpatient pediatrics unit.

Methods: Chart audits were performed on all patients upon discharge and with any change in status.

Results: No increase in unplanned upgrades or transfers after the change. The majority of patients were admitted for respiratory issues, gastrointestinal/genitourinary issues, or infections. Ages ranged from 2 days old to 21 years old. A total of 420 patients were included in the study. Seventeen patients had a change in status; eleven patients were upgraded to PIMCU status and six were transferred to the ICU.

Discussion: This research needs to be repeated with a larger sample size, ideally in a children's hospital. While our research has demonstrated safety in the policy change, additional studies are needed to assure safety in a wider variety of patients.

Oral Presentation O8.1

THE GUIDANCE AND DETECTION OF ASTROCHEMICALLY SIGNIFICANT CATIONS IN A VACUUM

Kevin Roenitz, Lydia Rudd, Daniel Roadman, and Manori Perera*
Chemistry Department, Illinois Wesleyan University

Astrochemistry is the study of chemical reactions that occur in space. Due to the extremely low pressure and temperature in space, many unique reactions that are impossible on earth can occur in space. The rate of reactions that occur in the interstellar medium (ISM) is very low due to (1) the distance travelled before two molecules collide and (2) the charge of the reactants to trigger a reaction. The focus of the Perera research lab is to explore the possible gas phase reactions between ions and neutral molecules that may occur in the ISM. In order to simulate ISM conditions on earth it is necessary to construct a multi-stage instrument. The first stage of the instrument consists of a supersonic ion source. Between the first and second stage is a skimmer which helps to focus the ions. The second stage of the instrument contains the first set of ion optics, a set of deflector plates, which will condense the ions into a beam. At the end of this stage is a Faraday cup which will detect the ion beam. Using this measurement, we will be able to calculate the ion source capabilities in producing various precursor ions. I have built the circuitry controlling the ion source, designed the mount for the skimmer and the Faraday cup and designed and built the deflector plates.

Oral Presentation O8.2

ASSESSING THE INDOOR TANNING BEHAVIORS AND RISK OF SKIN CANCER AMONG ILLINOIS WESLEYAN UNIVERSITY STUDENTS

Ellen Cornelius and Laurine Brown*

Environmental Studies Program, Illinois Wesleyan University

The purpose of this research is to assess the indoor tanning behaviors at Illinois Wesleyan University and formulate strategies to reduce students' risk of skin cancer. Skin cancer is widespread, and is the second most common cancer among people aged 15-24. There is strong evidence to support that many skin cancer cases seen today could have been avoided if the individual had never used an indoor tanning device. The use of indoor tanning devices is very popular among college-aged females, thus persuading this demographic to reduce their indoor tanning behavior is essential in order to reduce the rates of skin cancer. The methodology of the research included conducting an extensive literature review, interviewing three community key informants as well as 25 students, investigating the indoor tanning business in the community, and finally constructing and sending out an indoor tanning survey to Illinois Wesleyan students. Results indicated that indoor tanning is somewhat prevalent at Illinois Wesleyan: about 18 percent of survey respondents reported using them anywhere from one to over forty times in the last year. Several strategies were suggested to reduce this rate, and are being further developed.

Oral Presentation O8.3

AN INVESTIGATION OF ALGORITHM VISUALIZATION

Patrick Nevels and Mark Liffiton*

Computer Science Department, Illinois Wesleyan University

Algorithm visualization, a subfield of computer science research, is the visual representation of an algorithmic procedure or data structure. It often employs multimedia such as videos and animations. It has long been thought by computer science educators that visualizing algorithms and data structures may lead to better knowledge acquisition in computer science education. Several studies have tried to measure the effectiveness of algorithm visualization, and the results have been mixed. However, there appear to be features common among effective algorithm visualizations. Our goals for this project were twofold. First, we sought to synthesize current research by collecting features common among effective algorithm visualizations. Second, we sought to create an algorithm visualization for Professor Mark Liffiton's MARCO algorithm, employing several of the effective features and technologies we collected. In this work, we present the effective features as well as the algorithm visualization we created for the MARCO algorithm.

Oral Presentation O9.1

SHAKESPEARE'S MADWOMEN: HOW ELIZABETHAN THEATRE CHALLENGED THE PERCEPTION OF MENTAL AFFLICTIONS

Hannah Dhue and Dani Snyder*

School of Theatre Arts, Illinois Wesleyan University

I would like to write about the perception of madness in Elizabethan England. William Shakespeare's *Hamlet* will serve as my primary text and I will carefully examine Ophelia. However, it is my intent to use other works from the same era, perhaps even more examples from Shakespeare, to support my points.

Currently my research questions are as follows:

How did the theatrical representations of mad characters – particularly young women – in Elizabethan England reflect the perception of mental diseases and disorders at the time? To what extent were those representations serving as political comments? Were they typically in women characters? What does that say about the society?

Oral Presentation O9.2

THE VOICE OF SILENT FILMS: PASSING AFFECTIVE INFORMATION FROM SIGHT TO SOUND

Caitlyn Trevor and Joseph Plazak*
School of Music, Illinois Wesleyan University

Research on multi-modal perception provides support for the hypothesis that visual information can influence aural experience (McGurk, 1976; Shutz & Kubovy, 2009). This research investigated the influence of visual information on affective auditory processing by pairing positively or negatively valenced film clips with emotionally “neutral” music. Participants provided subjective ratings of valence and arousal for each clip. After a short distraction test, participants listened to the music used in the experiment once again, this time without accompanying visual information. Participants were then asked to rate the valence and arousal of each audio recording. Affective information from silent-films will alter the perceived emotionality of “neutral” music. Specifically, we predict that affective information from short film clips will “bind” to relatively neutral music. The results were variable, perhaps stemming from a lack of ecological validity.

Oral Presentation O9.3

THERE --> HERE

Jospeh O'Brien and Kevin Strandberg*
School of Art, Illinois Wesleyan University

To remember is to recollect an event or moment in the past. *There --> Here* examines the complex process of recollecting, how it is quite literally to re-collect. When a memory is accessed it is pieced together bit by bit. Details of the past event are collected from the annals of conscious thought, where they lay dormant since the event, waiting to be recalled. The focus of *There --> Here* is my own recollection of a day I spent wandering in a forest. I contrast two- and three-dimensional media to explore the complex process of remembering, examining the difficulties we face when attempting to reconcile a remembered past event with the immediacy of the here and now.

This installation is accompanied by a small series of photographs and a collection of writings.

Oral Presentation O10.1

COMPARATIVE PERSPECTIVE OF REGIONAL LEVEL BANK PROFITABILITY

Alexandra Bechtel and Amit Ghosh*

Economics Department, Illinois Wesleyan University

Using state-level data spanning the period 1966- 2012, this study provides a comparative perspective on the underlying factors that affect bank profitability between the Atlanta, Chicago and San Francisco Federal Reserve Districts. Employing panel data estimation techniques, I examine the impact of different asset categories on various measures of bank profitability. The profitability factors studied include real estate loans, loans to individuals, commercial and industry loans, and investment securities. Using a fixed effects model, I find that real estate loans during recessionary periods have a significantly negative impact on bank profitability in all three districts with the strongest impact in the San Francisco Federal Reserve District.

Oral Presentation O10.2

RESPONDENT LEARNING AND FATIGUE IN STATED CHOICE EXPERIMENTS

Derek Lindgren and Craig Broadbent*
Economics Department, Illinois Wesleyan University

Stated choice experiments have been shown to be a reliable valuation method for non-marketed goods and services. These experiments are usually conducted in a hypothetical survey form. Previous research has indicated that certain behavioral patterns in elicited respondents are inherent in the survey form and length. This study attempts to investigate if there is evidence of the behavioral patterns of preference learning and fatigue by analyzing data from two stated choice studies: 1) extensions to Constitution Trail in Bloomington/Normal, IL, 2) Riparian Forest Restoration in the Middle Rio Grande, NM. In comparing the estimated willingness to pay for each of the studies, there is evidence of a preference learning effect in both studies. Empirical evidence is not found to conclude that there is a fatigue effect. These lend evidence that researchers need to recognize that there is learning by participants in stated choice studies. As such the first few questions in a choice experimental survey may not provide stable preferences and should not be included in the value estimates.

Oral Presentation O10.3

DOES EDUCATIONAL INEQUALITY EXPLAIN INCOME INEQUALITY ACROSS COUNTRIES

Cristina Petcu and Ilaria Ossella-Durbal*
Economics Department, Illinois Wesleyan University

A wide variety of studies support the notion that income inequality has detrimental effects on a country's economic growth, levels of trust in government, and even health of its citizens. Throughout economics literature, numerous researchers have endeavored to explain the variance in income inequality across countries. One notable area of inquiry examines how dispersion in education of the labor force impacts income inequality, but it generally yields ambiguous and inconsistent results. This paper examines income inequality as a function of educational inequality in a cross-sectional analysis. It attempts to improve on previous research by utilizing more recent data such as the Gini coefficient of education calculated from the Barro and Lee (2010) dataset. Moreover, multiple regressions are analyzed which investigate the research question from a broader perspective, controlling for labor market outlook within a country, access and quality of education, socioeconomic conditions, and degree of meritocracy. Separate regressions are used grouping countries according to their level of development, due to the different institutional factors which make it difficult to compare countries across the development spectrum. This paper predicts that in accordance to human capital theory, educational inequality will positively impact income inequality.

Oral Presentation O10.4

OPEN TRADE POLICIES: FILTHY FOG OF THE FUTURE?

Erin Wachtel and Craig Broadbent*

Economics Department, Illinois Wesleyan University

This paper focuses on the relationships between open trade, environmental policies, and greenhouse gas exposures between the United States, Canada, and Mexico. Trade theory posits that opening trade will increase a country's gross national product. Furthermore, because of less government regulations in underdeveloped countries, it is predicted that for every increase in GDP in Mexico, there could also be an increase in air pollutants. This study focuses on CO₂, NO_x, N₂O, and CF₃ emissions (the major greenhouse gas emission) in three countries (Canada, Mexico and the United States) between 1980 and 2008. An OLS regression is employed to measure the impact that increases in GDP and political decisions (i.e. NAFTA and the Kyoto Protocol) can have on greenhouse gas emission. The results indicate that the first implementation of each policy has the largest impact on the environment and economic health of each country.

Oral Presentation O11.1

**THE FINAL COLONY: CATALANISM IN THE CONTEXT
OF THE DISASTER OF 1898**

Nathaniel Douglas and Carmela Ferradans*
Hispanic Studies Department, Illinois Wesleyan University

The open expression of Catalan nationalism has grown at an unprecedented rhythm. Three hundred years after Catalunya lost its independence in 1714, the region is once again seeking sovereignty. Parallel to this growth in regional nationalism, the central government in Madrid has strengthened its grip on the region. Even though this vigilance toward Catalunya has been institutionalized throughout the chapters of Iberian and Spanish history, Catalan nationalism, which forms a part of Catalanism, has appeared in more contexts than ever since the beginning of the 21st century. Without a doubt, the beginnings of the nationalist movement of Catalunya and Catalanism, which birthed the contemporary Catalan independence movement, remain in the 19th century. This investigation will postulate links between the historical events of the 19th century – above all the Disaster of 1898 and Spain's self-obsession – and the contemporary fight for Catalan independence.

Oral Presentation O11.2

IS ALL SPANGLISH THE SAME SPANGLISH?: AN ANALYSIS OF CODE SWITCHING AMONG BILINGUAL SPEAKERS OF COLOMBIAN, CUBAN, AND MEXICAN ORIGIN

Ethan M. Szpara and Christina Isabelli*
Hispanic Studies Department, Illinois Wesleyan University

Code switching is a phenomena used to describe those instances in which Spanish speakers in the United States interchange between English and Spanish during oral production. This phenomenon is thought to result from the influence of an English dominant society on the Spanish language. Linguistics research has indicated that the use of Spanish and English during conversations is governed by the grammar rules of both languages as a result of linguistic fusion. This study aims to evaluate Colombian, Cuban, and Mexican bilingual speakers for the presence of code switching during oral production through the use of ethnographic interviews. From these interviews an assessment of the similarities and variations present in the code switching used by the participants will be made leading to conclusions that may provide insight regarding the influence that the English language has on code-switching patterns.

Oral Presentation O11.3

SPANISH LANGUAGE USE IN CENTRAL ILLINOIS

Brynn Tomko and Christina Isabelli*

Hispanic Studies Department, Illinois Wesleyan University

Although English is the most commonly spoken language in the United States, the Spanish language has maintained its status across the nation. There have been a variety of studies on factors that affect language maintenance or shift, however the use of and attitudes towards the Spanish language in rural areas warrant more study. These types of studies are crucial for understanding the different factors that play a role in the maintenance of a heritage language. This study attempts to examine the use of and attitudes towards the Spanish language of a group of Spanish-speakers in Central Illinois. The data collected via a Qualtrics questionnaire, similar to the one used in Stone (1987), seeks to provide insight of the possible factors that may affect the maintenance or shift of Spanish in the community based on their usage in different domains and attitude toward the language.

Stone, Gregory, (1987). "Language choice among Mexican-American high-school students in Saint Paul, Minnesota: Some preliminary findings." In J. Matluck, T. Morgan, J. Lee, & B. VanPatten (Eds.), *Language and language use: Studies in Spanish* (pp. 147-159). Lanham, MD: University Press of America.

Oral Presentation O12.1

**STUDENT ATHLETES AND INJURY:
THE IMPACT OF IDENTITY AND COMMUNITY**

Devonte Jones and Meghan Burke*
Sociology Department, Illinois Wesleyan University

Studies have shown that those who identify strongly with athletics tend to have a harder time when dealing with sports injuries. The purpose of my study is to assess the impact that injuries have on student athletes' identities. I utilize interviews with male and female student athletes at Illinois Wesleyan University in order to determine the significance of athletics to their personal identity, their coping strategies after the injury, and the impact on athletes' community and social life. I found that most of the athletes at IWU strongly identify with their athletic role, and thus face personal and social struggles when recovering from an injury. Those struggles include normalizing the pain, putting pressure on themselves, feelings of denial, and a lack of support from coaches. All of these social barriers continue to impact the athlete's identity and recovery process.

Oral Presentation O12.2

**SELF-REPORTED EXPERIENCES OF DATING ABUSES AMONG
COLLEGE STUDENTS IN ROMANTIC RELATIONSHIPS**

Melissa Kinsella and James Sikora*
Sociology Department, Illinois Wesleyan University

Past researchers have examined the prevalence of dating violence among college-aged students in the United States. Using a self-reported survey of the experiences of current college students, this study analyzed some of the factors related to physical, emotional, and sexual abuses in their romantic relationships. From that analysis, comparisons were drawn with the research from other college-university samples, attempting to describe and explore the problem of violence in premarital relationships.

Oral Presentation O12.3

UNDERSTANDING ATTITUDES TOWARDS INTERRACIAL RELATIONSHIPS AMONG COLLEGE STUDENTS

Nicole Pierce and Meghan Burke*
Sociology Department, Illinois Wesleyan University

The number of interracial couples in the United States remains low in today's society. This study uses qualitative interviews and quantitative survey data from Illinois Wesleyan students to investigate the motivations, perceptions, and experiences of those who are currently, or were previously, in an interracial relationship. I also explore the attitudes of those who have not dated interracially, and the media's impact on perceptions of interracial couples. I find that those who dated interracially did not see race as a deciding factor, but instead focused on personality, cultural similarities and differences, and appearances. Many students saw religion, peer and family support, and socioeconomic status as factors that influence the likelihood of dating interracially. Contradictory statements were made on the portrayal of interracial couples in the media; however, most concluded that the media images are generally positive. Better understanding these perceptions among current college students may have implications for future trends.

Oral Presentation O13.1

**MARTIN LUTHER: VATER EINER ALLGEMEINEN SPRACHE?
MARTIN LUTHER: FATHER OF A COMMON LANGUAGE?**

Annika Ewaldz and Adam Woodis*

German, Russian and Asian Languages Department, Illinois Wesleyan University

Martin Luther is well known for his *95 Theses*, in which he rejects the Catholic practice of selling indulgences; but it was his groundbreaking translation of the Bible into German that instigated the standardization of the German language. After his excommunication, Luther was in hiding in the Wartburg Castle, where he translated his Bible into a vernacular and cohesive form of the German language. Many different dialects were spoken throughout Germany at the time making communication between regions difficult. Luther's translation soon became the most influential Bible in Germany and was disseminated quickly due to the recently invented printing press. By tracing the printings of Luther's Bible and the spread of Lutheranism throughout Germany, one can see how Luther's translation exerted a major influence on the dialects of specific regions in Germany, especially those of Nuremberg, Augsburg, and Strasbourg, and how Luther ultimately contributed to standardization of the German language.

Oral Presentation O13.2

HAPPY WIFE, HAPPY LIFE: A THEORETICAL APPROACH TO DUAL IDENTITY IN GREEK COLONIES

Colleen Melone and Amanda Coles*

Greek and Roman Studies Program, Illinois Wesleyan University

In the eighth and seventh centuries, as many Greek city-states expanded westward forming new settlements, some settlers married native women. Colonists who participated in intermarriage encouraged their native wives to participate in rituals at Greek sanctuaries, one of four indicators of Greek ethnicity according to Herodotus, in order to facilitate a dual identity. By applying Althusser's concept of the Ideological State Apparatus which postulates that religion imposes identity, this presentation proves that incorporating natives into Greek religion was a form of cultural conversion. Archaeological evidence of indigenous objects in Greek settlements shows that natives were able to incorporate their own cultural aspects in Greek society as long as they were not of a religious nature. When analyzed through the lens of Althusser's theory, this demonstrates that religion was an important tool used to develop Greek ethnicity. My findings are significant because they show how Greeks used religion to create a cultural identity with local populations with whom they intermarried, in order to facilitate a more peaceful community.

Oral Presentation O13.3

CARVING THE PERFECT CITIZEN: THE ADVENTURES OF SOVIET PINOCCHIO IN TEXT AND ON SCREEN

Rachel Branson and Marina Balina*

Literature and Culture Studies, Illinois Wesleyan University

In 1936, Alexei Tolstoy's *The Golden Key, or The Adventures of Buratino* was published, heralding the use of children's literature and fairy tale structure as an ideological and transformative tool for children in the Soviet Union. *The Adventures of Buratino*, framed by Alexei Tolstoy's alleged recreation from memory of Carlo Collodi's *The Adventures of Pinocchio* (1883), was a Soviet fairy tale, portraying Buratino as a hero for his fellow puppets in helping to free them from the corrupt and oppressive power of Karabas Barabas, the owner of the puppet theater. While Barabas serves as an embodiment of an exploiter and degenerate capitalist, Buratino is depicted as a true revolutionary, who is selfless, who fights for collective goals, and represents the liberator for the poor and oppressed.

As a Soviet tale, *Buratino* has several incarnations: one, of course, being Tolstoy's original text, another as a play, and two as film representations. For my project, I will track the change in visual representation of Buratino and the possible ideological implications and controversies that these changes might have as the story shifts from Tolstoy's narrative to the Soviet 1939 (employing both animation and live action characters) and Soviet-time Belarussian 1975 TV musical for children.

In addition, importance will be placed on the manner in which characters from *Buratino* are present, absent, or simply transformed from the original *Pinocchio*. The Soviet film versions will be compared to American visual representations of *Pinocchio* in the 1940 Disney film that also presented an ideologically charged visualization of an old fairy tale.

POSTER SESSION A

9:00 - 10:00 a.m.

Odd-Numbered Posters

POSTER SESSION B

2:00 – 3:00 p.m.

Even-Numbered Posters

EDUCATIONAL STUDIES ORAL AND POSTER PRESENTATIONS - ES

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 3:30 p.m.

Poster Presentation P1

**THE PREVALENCE OF LEAD FRAGMENTS FROM SHOTGUN
SLUGS/MUZZLELOADER BULLETS IN GROUND VENISON MEANT
FOR HUMAN CONSUMPTION**

Genevieve Alexander and Given Harper*

Environmental Studies Program, Illinois Wesleyan University

Recent studies have shown that lead shotgun slugs and muzzleloader bullets often fragment inside game animals. The majority of ammunition types used in firearms that are permitted by the State of Illinois for hunting white-tailed deer (*Odocoileus virginianus*) contain lead, which is toxic to both humans and animals that scavenge deer carcasses. Although many studies have examined the impact of lead bullet fragmentation in game animals from high powered rifles, few studies have documented the presence of lead fragments from shotgun slugs and muzzleloader bullets in ground venison meant for human consumption in Illinois. In this study, ground venison packets obtained from firearm-harvested and bow-killed deer during the 2013 and 2014 Illinois deer hunting seasons were x-rayed to determine the presence of lead fragments. X-ray images revealed possible lead fragments in 6/10 of ground venison packets from firearm-harvested deer. Further tests will be performed to determine lead levels in all venison packets.

Poster Presentation P2

**DEXAMETHASONE EXPOSURE AND THIGMOTAXIS IN
LARVAL ZEBRAFISH (*DANIO RERIO*)**

Ethan Gelke, Casie Henrikson, Inez White, Kali Lewis, Samuel Aronson, Sarah Whitchurch
and Brad Sheese* and Bruno deHarak*

Psychology and Physics Departments, Illinois Wesleyan University

Dexamethasone is a corticosteroid commonly used as an anti-inflammatory drug in humans. Dexamethasone is also given to pregnant women at risk of pre-term delivery to accelerate fetal lung development. Research with animal models has linked early exposure to Dexamethasone to lasting disturbances of cranial/facial morphology and brain development. The current study examined the association between early Dexamethasone exposure and anxiety-like behaviors using Zebrafish (*Danio Rerio*) as a model organism. Thigmotaxis (edge-preference) in fish is thought to be analogous to rodent wall-hugging behaviors in open field tests. Pharmacological manipulations with anxiogenics and anxiolytics produce reliable alterations in thigmotaxis consistent with the interpretation that thigmotaxis reflects anxiety-like states in fish. Immediately after fertilization, zebrafish larvae were randomly assigned to one of three conditions: 1) dexamethasone plus solvent exposure, 2) solvent exposure, or 3) control. At 7-days post fertilization, the fish were introduced to a novel environment and their thigmotactic behavior was recorded and analyzed.

Poster Presentation P3

**TEST RE-TEST RELIABILITY OF ZEBRAFISH (*DANIO RERIO*)
BEHAVIOR IN THE NOVEL TANK PARADIGM**

Casie Henrikson, Inez White, Kali Lewis, Samuel Aronson, Sarah Whitchurch
and Brad Sheese* and Bruno deHarak*
Psychology and Physics Departments, Illinois Wesleyan University

Zebrafish (*Danio Rerio*) have become an important model organism in biomedical and neuroscience research. Zebrafish have been used extensively to study teratological and pharmacological influences on anxiety-related behaviors. Anxiety-related behaviors include thigmotaxis (edge-preference) in juvenile fish and bottom preference in adult fish when these fish are introduced to novel environments. The Novel Tank Paradigm is a standard assessment of anxiety-related behaviors in Zebrafish. Pharmacological manipulations with anxiogenics and anxiolytics produce reliable alterations in Zebrafish behaviors in the Novel Tank Paradigm. The current project sought to develop an automated, inexpensive, general-purpose tracking system that would allow for high-throughput, reliable, and comprehensive assessment of Zebrafish behaviors in the Novel Tank paradigm. In addition, we used the system we developed to examine the stability of these behaviors over time. Adult Zebrafish were tested in the Novel Tank paradigm twice a day for three days. Behaviors were recorded by camera and coded both by trained human coders and by the software we developed for the project.

Poster Presentation P4

POSSIBLE NEW THERAPEUTIC TREATMENT FOR SICKLE CELL DISEASE

Ben Becker and Brian Brennan*

Chemistry Department, Illinois Wesleyan University

There are an estimated 300,000 children born with Sickle Cell Disease annually worldwide. Though it was the first disease to be demonstrated as a genetic disorder, a viable treatment for those with the genetic disorder still eludes us. The pathology of Sickle Cell Disease results from a point mutation on chromosome 11 that results in a switching of a hydrophilic amino acid, glutamic acid, for a hydrophobic amino acid, valine. The newly added valine is expressed on the surface of the hemoglobin protein in erythrocytes or red blood cells. Valine is able to interact with an exposed hydrophobic pocket in another deoxygenated hemoglobin molecule. These interactions lead to long polymer chains of hemoglobin and distort the shape of the cell into the commonly recognized sickle shape. Recreation of physiological conditions is required to induce polymerization. Syntheses of polypeptides that bind to hemoglobin are being tested for their effectiveness in delaying the polymerization time of hemoglobin. Polymerization time is measured by time at which an increase in absorption at 700nm occurs in the UV-Vis. Peptides showing possible potential include ZSF-6, ZSF-13, and ZSF-18.

Poster Presentation P5

POLYOXOMETALATE CATALYZED ORGANIC DYE DEGRADATION

Jennifer Bjorklund and Rebecca Roesner*

Chemistry Department, Illinois Wesleyan University

Polyoxometalates (POMs) have been of interest to chemists in recent years due, in part, to their ability to function as oxidation catalysts. POMs are also noted for their capabilities to act as photocatalysts. POMs are pH sensitive; most are stable only under acidic conditions. Because of their anionic character, POMs adhere to anion exchange resins, and the POM-resin adducts can serve as heterogeneous oxidation catalysts. In this work, the POM, sodium phosphotungstate, was adsorbed on the surface of the anion exchange resin Amberlite IRA 900. When pre-treated resin was stirred with a solution that was 0.10 M in sodium phosphotungstate and buffered to pH of 2.5 using a citric acid-phosphate buffer, all of the POM was taken up by the resin. The resin was used along with hydrogen peroxide and light to bleach the organic dye Rhodamine B.

Poster Presentation P6

A COMPARISON OF HEALTHCARE SYSTEMS IN ILLINOIS, USA AND CATALONIA, SPAIN

Jennifer Boll and Carolyn Nadeau*
Hispanic Studies Department, Illinois Wesleyan University

This project focuses on the differences in healthcare systems in Illinois, United States and Catalonia, Spain. The research includes a literature review on the different systems and the fundamental differences in how care is delivered. An investigation of the major differences in the cultural and political approaches to health care and how the systems provide for their patients is part of the study. Another focus is the treatment of Spanish-speaking patients in hospitals in Illinois and also the treatment of patients who speak Castilian (traditional Spanish) in hospitals in Catalan-speaking Barcelona. This comparison displays the importance of language in the two health systems and how it affects the treatment and outcomes of the patients. Also discussed is how the treatment of immigrants differs from that of natural born citizens. The purpose of this study is to analyze how the different systems work and what can be learned from how each country organizes and executes their health care system. It also sheds light on health disparities in both countries including how and why they occur and what may be some potential solutions to these avoidable health inequalities.

Poster Presentation P7

**A MINUTE NEW SPECIES OF FROG
(STRABOMANTIDAE, *PRISTIMANTIS*) FROM A CLOUD FOREST
IN SOUTHERN PERU**

Cecilia Boyd and Edgar Lehr*

Biology Department, Illinois Wesleyan University

The frog genus *Pristimantis* is distributed throughout Central and South America and contains 459 species, 123 of which are known to occur in Peru. Herein, we present a new species of *Pristimantis* from a cloud forest of the Rio Mantalo obtained at 2100 m above sea level in southern Peru. The new species is readily distinguished from other species in the genus by having a distinct red-orange groin, a smooth dorsum of brown and green coloration, and a short snout-vent length: 13.8–17.5 mm (n = 8, in adult males), and 20.1–22.2 mm (n = 2, in adult females). The new species is most similar to other small species of *Pristimantis* such as *P. trachyblepharis* and *P. minutulus*, but is discernible from both by having males with vocal slits, by its coloration, and by having a head wider than its body. Furthermore, the new species occurs at higher elevations (2100 m vs. 320–1250 m in *P. trachyblepharis* and 900–1200 m in *P. minutulus*).

Poster Presentation P8

THE ISOLATION AND ANALYSIS OF THE MYCOBACTERIUM PHAGE ZONIA

Abigail Brown, Ryan Orloski, Shivum Patel, Jamie Gradishar, Jennifer Carter
and David Bollivar*

Biology Department, Illinois Wesleyan University

The mycobacterium phage, called Zonia, was isolated in Des Peres, Missouri. This phage was determined to be a virulent phage and part of the B1 subcluster. Zonia produced two distinct plaque morphologies ranging from 2-5mm; both were circular with a dark border. A high titer lysate with a concentration of 5.9×10^{13} pfu/mL was used to isolate DNA. Through gel electrophoresis it was determined that the DNA was good quality and the concentration was 250 ng/ μ L. The DNA was sequenced at a facility in North Carolina and was determined to have 69,271 base pairs. The genome was annotated using GeneMark, Glimmer, HHpred, and DNA master and it was recognized to have 104 genes with various functions. Once the phage was annotated, similarities were found when compared to other phages in the B1 subcluster such as: Oline and YouGoGlencoco.

Poster Presentation P9

NANO-NANO: DETECTING NANOMETER SCALE MOTION AT NANOSECOND TIMESCALES

Emily Brown, James Connolly, Daniel Krob, Alexander Scherer, Ian Simmons, Jakeshan Thaker
and Bruno deHarak*

Physics Department, Illinois Wesleyan University

We are in the process of developing a detector that is capable of measuring the movement of a test mass with a spatial resolution of 10's of nanometers and a temporal resolution of a few nanoseconds. This detector will be used in future experiments that will examine weakly coupled oscillators. Essentially, the detector consists of a Michelson interferometer with the mirror for one arm mounted on the test mass. A fast photodiode is used to measure changes in the interference pattern as the test mass moves. In this presentation, we will detail, and explain, the design of the detector, as well as providing a status of its current capabilities.

Poster Presentation P10

SYNTHESIS OF CROWN-ETHER MOLECULAR RECEPTORS FOR POLYOXOMETALATES

Sidhartha Chaudhry and Rebecca Roesner*
Chemistry Department, Illinois Wesleyan University

Polyoxometalates are a class of polyatomic ions in which several transition metal-oxygen polyhedra are joined together by shared oxygen atoms to form closed, three-dimensional structures. The large diversity in size, charge, composition, and oxidation states of these anions produces a wide range of properties, and even greater range of applications, particularly in catalysis. The recovery and reuse of these anions would be advantageous in many industrial applications such as wood pulp bleaching. Crown ether complexes of alkali metal cations have been reported to interact favorably with polyoxometalates. The goal of this project is to synthesize a crown-ether molecular receptor (Figure 1) that can reversibly interact with different types of polyoxometalates in order to regulate their catalytic activity or recover them from reaction mixtures. After 4'-aminobenzo-15-crown-5 was prepared in four steps using published procedures, two of the 15-crown-5 units were coupled using a difunctional acid chloride. In a final step, the resulting amide-containing receptor will be reduced using lithium aluminum hydride. The chemical properties of the receptor will be investigated.

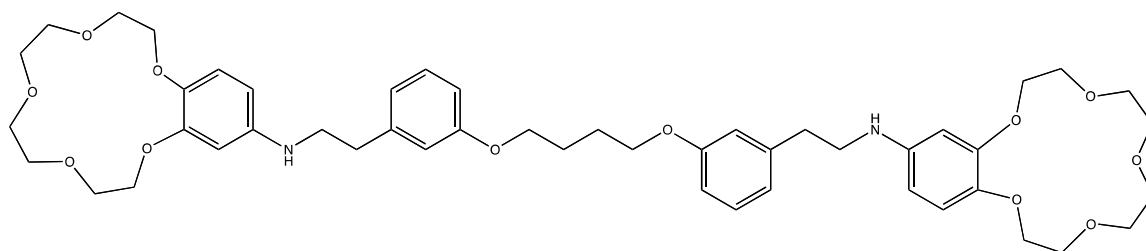


Figure 1-Proposed Molecular Receptor

Poster Presentation P11

A NEW SPECIES OF *PRISTIMANTIS* (AMPHIBIA: ANURA) FROM THE ANDES OF NORTHERN PERU

David Dickinson and Edgar Lehr*
Biology Department, Illinois Wesleyan University

In Peru, frogs of the genus *Pristimantis* can be found from Amazonian lowland forests to high elevations in the Andes. Currently there are 459 species of *Pristimantis* known, 123 of which occur in Peru. Herein, we present and diagnose a new species of *Pristimantis* that was collected between 2974 and 2986 meters above sea level in a cloud forest in northern Peru. The new species is characterized by a snout-vent length of 34.2–37.3 mm ($n = 3$, all females), having Finger I longer than Finger II, having narrow finger tips and toe tips which lack circumferential grooves, lacking a tympanic annulus and tympanic membrane, having smooth skin on dorsum and venter, and having a yellow venter. The new species is most similar to members of the *Pristimantis orestes* Group and superficially similar to *Lynchioides flavomaculatus* and *Lynchioides parkeri*, but can easily be distinguished from those in various characters.

Poster Presentation P12

DEVELOPMENT OF A ROTATIONAL STAGE FOR OPERATION AT 4K TEMPERATURE

Huy Do and Thushara Perera*

Physics Department, Illinois Wesleyan University

Simple mechanical device, such as a clock, will not function properly when placed in a low temperature environment such as outer space. While designing and building the mechanical apparatus for low temperatures, we have to consider (1) special lubricants for ball bearings (standard lubricants will freeze at low temperature, thus stalling the rotation) and (2) strict requirements for the materials we can use. High precision is also important in the machining process. To solve these problems we have investigated the performance of hybrid ball bearings that are dry lubricated with tungsten disulfide (WS_2). We use Aluminum and G10 because of its machinability and low thermal conductivity. Early test results indicate that the design works well enough. At a temperature of 77 K, the minimum torque needed to rotate the wheel is about 3.33 Nm, which is not prohibitive for our application. In the future, we plan to make improvements to the design to stabilize the rotation, increase the rigidity of the structure and perform the test on different types of ball bearings.

Poster Presentation P13

**NEURAL AND BEHAVIORAL EFFECTS OF BEING SOCIALLY
EXCLUDED BY THE TARGETS OF A WITNESSED
SOCIAL EXCLUSION**

Kaitlin Dunn and Jason Themanson*

Psychology Department, Illinois Wesleyan University

The consequences of social exclusion can be extremely detrimental to physical and emotional well-being; ranging from mild distress to extreme violence and aggression. Therefore, a greater understanding of the factors that determine these responses to social exclusion is of utmost importance. Accordingly, this study will examine the association between witnessing and experiencing social exclusion using both neural and behavioral measures. Neural activity will be collected while participants watch a computerized game of catch (Cyberball) in which two of the players are either included or excluded. Then, the participants will play Cyberball with the previous targets of the exclusion/inclusion and will then be either included or excluded themselves. It is predicted that exclusion-related neural activity will be decreased for the excluded participants who witnessed social exclusion previously as they will have mentally prepared for exclusion while watching others be excluded.

Poster Presentation P14

BACTERIOPHAGE PIRO94

Jessica Edwards, Emil Maric, Brianna Piro, Rachel Zarchy and David Bollivar*

Biology Department, Illinois Wesleyan University

Soil samples from various locations across the Midwest were collecting during the fall of 2013. Through enrichment of the soil samples, novel phages were isolated, purified, and characterized. Using bacteriophage characteristics, such as plaque morphology, lifestyle and DNA restriction patterns, it was determined that Piro94 is unique from other phages isolated in the laboratory section. The bacteriophage, Piro94, was sent to the University of Pittsburgh for sequencing. After sequencing, it was determined that Piro94 is a member of subcluster A2. It has 52,647 base pairs and a 3' overhang length of 10 base pairs. The 3' overhang sequence was determined to be CGGTCGGTTA. The genome of Piro94 was subsequently annotated. Upon BLASTing the entire genome, it was discovered that Piro94 is most similar to the bacteriophages Echid, RedRock, Pukovnik, Turbido, and Trixie. The genome was annotated using a variety of software programs including GeneMark, Glimmer, Phamerator, HHPred, and DNA Master. There were a total of 92 genes and one tRNA for which the students determined the appropriate gene lengths and potential functions. All of the data regarding the bacteriophage, Piro94, will be submitted to Mycobacteriophage DataBase and the annotated genome will be submitted to the DNA database and GenBank.

Poster Presentation P15

THE IMPACT OF BEING IN A ROMANTIC RELATIONSHIP ON ONE'S BODY IMAGE

Kaitlyn Eichinger and Marie Nebel-Schwalm*
Psychology Department, Illinois Wesleyan University

This study examines romantic relationship quality and body image. Specifically, we looked at romantic relationship attachment and support. Individuals in supportive and securely attached romantic relationships are hypothesized to have healthier body images than those who are in unsupportive, insecurely attached relationships. Additionally, we were interested in the effects of relationship quality on coping and expected that those in highly secure and supportive relationships would experience lower stress and fewer symptoms of anxiety and depression. We also looked at the relationship of these variables over time, a three month period, to see if they would remain stable. We used regression analyses determine whether relationship status predicts body image satisfaction and whether quality of relationship moderates this association.

Poster Presentation P17

DECOMPOSING COMPLETE GRAPHS INTO A GRAPH PAIR OF ORDER 6

Yizhe Gao and Daniel Roberts*

Mathematics Department, Illinois Wesleyan University

Firstly, a graph G consists of a vertex set $V(G)$, and an edge set $E(G)$ of endpoints which relate two vertices with each edge. Also, a decomposition of a graph is a list of subgraphs such that each edge appears in exactly one subgraph in the list. In the field of graph theory, graph decomposition is an active field of research. A graph pair is a pair of graphs on the same vertex set whose union is the complete graph. Abueida and Daven studied decompositions of complete graphs into graph-pairs of order four and five. We are extending their results by investigating which complete graphs decompose into a specific graph pair of order 6.

Poster Presentation P18

VOLUNTEER EXPERIENCES WITH PEOPLE WITH AUTISM

Tyler Gedvilas and Linda Kunce*

Psychology Department, Illinois Wesleyan University

Given that people with autism spectrum disorder may face increasing social isolation as they age (Orsmond, Shattuck, Cooper, Sterzing, & Anderson, 2013; Eaves & Ho, 2008), there is a need to establish a stronger system of advocates who can assist in facilitating the social integration of this growing community (Crabtree, 2011). Because volunteerism in college predicts future engagement in similar volunteer and career activities (Astin, Sax, & Avalos, 1999; Tomkovick, Lester, Flunker, & Wells, 2008), volunteering with people with ASD may promote advocacy for and social integration of people with ASD. Using a quasi-experimental design, we investigated the experiences of college students and alumni (n=88) who volunteered with one of three different populations: adults with autism, adults with intellectual disabilities, and a variety of community members in a Midwestern city. There were no significant differences in students' perceptions of the impact of their volunteer experiences on their self-esteem, self-efficacy, or mood. However, students who volunteered with people with autism or intellectual disabilities were significantly more likely to indicate greater understanding and awareness as well as future willingness to engage in advocacy activities for those populations. These findings support the idea that college volunteerism may be an avenue to future advocacy in the disabilities community.

Poster Presentation P19

OVERCOMING AUDITORY ILLUSION THROUGH OPTICAL REALITY

Jonathan Gholson and Bruno deHarak* and Joseph Plazak*
Physics Department and School of Music, Illinois Wesleyan University

Most people seem to be well-acquainted with optical illusions. Whether through everyday experience or from printed collections, one is bound to happen across numerous optical illusions during their lifetime. However, illusions can affect our other senses as well. Auditory illusions, similar to optical illusions, arise from the complexities of the brain's interpretation of sound. They are not wholly uncommon, appearing frequently in a variety of musical works and occasionally in everyday life, yet arguably occur far less regularly than optical illusions. Our ultimate goal is to develop methods of overcoming an auditory illusion, or to at least alter its significance, through a visual cue such as an animated video. As illusions are by their very definition a false reality, the ability to not only understand how these illusions are propagated, but what is needed to overcome them should be of much interest to those in the physical and psychological sciences. Furthermore, those in the performing arts may find the end results of this project to be of interest as many 21st century artists are attempting to blend sight and audio in novel fashions.

Poster Presentation P20

**THE EFFECT OF BEAD CONCENTRATION AND BEAD SIZE ON THE
CLEARANCE RATE OF *BRACHIONUS PLICATILUS***

Paige Maurer, Allison Gibson and William Jaeckle*
Biology Department, Illinois Wesleyan University

Rotifers are small, free-swimming invertebrate animals found in freshwater and marine habitats. Their locomotion and feeding mechanisms involve the beating of cilia located on the corona. Rotifers consume various sizes of prey including bacteria, algae, and protozoans. We examined the effect of particle size and particle concentration on the feeding ability of the marine rotifer *Brachionus plicatilis*. Groups of rotifers were exposed to different concentrations of polystyrene beads (0.45 μm or 4.5 μm) for ten minutes. After incubation, the number of beads within the digestive system of each rotifer was counted using fluorescence (0.45 μm beads) and transmitted (4.5 μm beads) light microscopy. From these counts, we calculated the ingestion rates (beads/animal-hour) and clearance rates (mL of water cleared of particles/animal-hour). We found that the average clearance rates of 4.5 μm beads was significantly higher than the clearance rates of 0.45 μm beads (Mann-Whitney U, $p = 0.05$, $n = 4$). For 4.5 μm , particle concentration had a significant effect on clearance rate (Spearman's, $p < 0.005$, $r = -0.819$).

Poster Presentation P22

WHAT COLOR ARE PURPLE BUTTERFLY WINGS: A STUDY OF OPTICAL STRUCTURES

Victoria Halevy, Tyler Sterr and Bruno deHarak*
Physics Department, Illinois Wesleyan University

At first glance, morpho butterfly wings appear to be a purple color. However, when they are held up to the light, they seem transparent. This is because morpho butterfly wings get their brilliant colors from the physical structure of the scales on the surface of the wing. This structure is a series of ridges spaced a few hundred nanometers apart. When light shines on these ridges, interference effects cause iridescence. We measured the spectrum of light reflected from a wing as a function of reflected angle and modeled these results mathematically. We also looked at morpho butterfly wings using a scanning electron microscope to verify the structure. Studying the structure of a butterfly wing can be used pedagogically to teach about the nature of light and to make observations about optical phenomena in the natural world.

Poster Presentation P23

BACTERIOPHAGE HERCULES11

Kristin Ullberg, Megan Smeets, Paige Hasty, Rahul Shrikanth, and David Bollivar*
Biology Department, Illinois Wesleyan University

The purpose of this project is to isolate and characterize one distinctive phage capable of infecting the bacteria, *Mycobacterium smegmatis*. Hercules11 was isolated from a soil sample collected outside of Munsell Hall on the Illinois Wesleyan University campus. The bacteriophage, or phage, was isolated via enrichment and further purified using streak assay techniques. Hercules11 was characterized as having a 2.0 mm diameter, transparent plaque morphology, lysogenic lifestyle, and unique DNA restriction patterns. North Carolina State University's Genomic Sciences Laboratory sequenced the genome of Hercules11. After Auto-Annotation by DNA Master software, it was determined that Hercules11 had 90 genes comprised of 49,529 base pairs. A nucleotide BLAST revealed that Hercules11 is closely related to other phages including JHC117, Bxz2, and Jobu08, placing it in the A3 subcluster. In order to annotate and analyze the genome, the programs GeneMark, Glimmer, and DNA Master were used. Potential protein functions were compared to results from similar proteins using HHPred and BLASTP. Genome data will be submitted to the online Mycobacteriophage Database. Upon completion, the annotated genome will be submitted to GenBank, an online DNA database.

Poster Presentation P24

THREE DIMENSIONAL TRACKING OF MULTIPLE OBJECTS

Christopher Jent, Nickolas Miller and Bruno deHarak*
Physics Department, Illinois Wesleyan University

It is known that *Artemia* spp. increase their speed in warmer water. What is not known is how much of this increase is due to the decreased viscosity of the liquid at higher temperatures, and how much is due to the increased metabolism of the *Artemia* spp. at higher temperatures. We developed an automated system for tracking the motion of multiple objects in 3 dimensions. This system could be used to calculate the motion of *Artemia* spp. in a temperature and viscosity controlled environment. From that one could determine what the effects of these variables are on *Artemia* spp. motion.

Poster Presentation P25

NORMATIVE BELIEFS AS A MEDIATOR BETWEEN BODY DISSATISFACTION AND DISORDERED EATING

Antonia Jurkovic and Marie Nebel-Schwalm*

Psychology Department, Illinois Wesleyan University

Mintz and Betz (1988) found that a majority of college women were classified as having an eating disturbance (61%), showing that being concerned with one's body and practicing maladaptive weight control techniques has become normative in this population. One risk factor that is well-researched is body dissatisfaction (Klemchuk, Hutchinson, & Frank, 1990). Although studies have shown that disordered eating has become normative, research is lacking in the measurement of actual individual normative beliefs. How appropriate or acceptable an individual believes maladaptive weight loss strategies are may predict which individuals are at a higher risk.

Female students recruited from IWU will complete a demographic measure, as well as the Photographic Figure Rating Scale in order to measure body image, (Swami et al, 2008), the EAT-26 as a measure of eating disorder symptomatology (Garfinkel & Garner, 1979), and the Disordered Eating Normative Scale, which we created. We will test for mediation using a four-step regression procedure as explained by Baron & Kenny (1986). We predict that normative beliefs will at least partially mediate the relationship between body dissatisfaction and maladaptive eating behaviors.

Poster Presentation P27

**EGGSHELL POROSITY IN RELATION TO BROOD HATCHING
PATTERNS IN HOUSE WRENS (*TROGLODYTES AEDON*)**

Alexander Lang, Abigail White and Given Harper* and William Jaeckle*
Biology Department, Illinois Wesleyan University

In bird species, the eggs of a clutch may hatch asynchronously over several days, which results in offspring that differ considerably in size shortly after hatching due to the growth advantage of earlier hatched siblings. As a result, the last-hatched nestlings may be outcompeted for food by older siblings and die of starvation. In contrast, if the eggs of a clutch hatch synchronously (i.e., within a day of one another), siblings are similar in size. Maternal incubation can influence brood hatching patterns in that commencement of incubation prior to laying the penultimate egg results in an asynchronously hatched brood, whereas delaying incubation until the penultimate or ultimate egg is laid results in a synchronously hatched brood. Variation in eggshell porosity (i.e., total eggshell pore area \div eggshell thickness) may also explain differences in developmental rates and hatching spans among siblings. Eggshell pores permit gas exchange to/from the developing embryo, and higher rates of gas exchange may accelerate rates of development. In this study, we assessed within- and among-clutch variation in eggshell porosity by determining the number of pores, pore diameter, and eggshell thickness in a population of House Wrens (*Troglodytes aedon*). We then compared those data to the commencement of incubation by females. We found that females that initiated full incubation before laying all of their eggs produced eggshells with more pores and slightly greater porosity, on average, than females that delayed incubation until clutch completion.

Poster Presentation P28

**DEVELOPMENT AND CHARACTERIZATION OF
MULTI-FUNCTIONAL PROBES AND THEIR USE IN THE
DETECTION OF NEUROTRANSMITTER RELEASE EVENTS**

Jiwon Lee and Melinda Baur*

Chemistry Department, Illinois Wesleyan University

Ultramicroelectrodes are useful for neurotransmitter release from cells because they can be positioned very close to the cell surface and they can detect very small amounts of neurotransmitter molecules. Ultramicroelectrodes were fabricated by inserting a carbon fiber into a glass capillary tube, pulling the tube to a fine tip, sealing the tip with epoxy resin, and threading a wire through the electrode. The electrodes were characterized with cyclic voltammetry in a Ruthenium Hexamine Chloride solution. These electrodes can be used to detect neurotransmitter release from a cell by positioning it very close to the cell surface. Release of neurotransmitters from a cell surface can be detected by amperometry. Full fusion, kiss-and-stay fusion, kiss-and-go fusion, and pre-foot are the different mechanisms of exocytotic release that have been characterized in model neurons.

Poster Presentation P29

**THE DEVELOPMENT AND CHARACTERIZATION
OF DUAL ELECTRODES FOR USE WITH
SCANNING ELECTROCHEMICAL MICROSCOPY**

Colleen Leonard and Melinda Baur*
Chemistry Department, Illinois Wesleyan University

Scanning Electrochemical Microscopy (SECM) utilizes electrode probes that can be positioned just abutting cells and can detect the presence of small quantities of chemicals known as neurotransmitters. In order to detect neurotransmitter release from PC12 cells, used as model neurons, the electrode must be positioned very close to the cell surface to detect the change in current that accompanies the oxidation/reduction of the neurotransmitters released. The peaks in current were analyzed in order to detect differences in release mechanisms, such as slow or fast-release. Furthermore, dual electrodes were made and characterized in order to monitor two different locations on a cell simultaneously. They can also be modified to observe two different electrochemical processes, such as amperometry and potentiometry.

Poster Presentation P30

EXPRESSION OF GENE PRODUCT 126 FROM PHAGE GIZMO AND CREATION OF A SUBSTRATE

Manish Mandava and David Bollivar*

Biology Department, Illinois Wesleyan University

Endonucleases are enzymes which cleave DNA at specific nucleotide sequences. Homing Endonucleases (HEase) are a group of endonucleases that reside as open reading frames within self-splicing introns or inteins. After expression of the gene containing the HEase the HEase goes on to cleave a target site in a homolog of the hosting gene to induce homologous recombination turning the vacant homolog into a homing endonuclease gene (HEG). It is predicted that gene product (gp126) from the mycobacteriophage Gizmo encodes a HEase. To test whether the gene encodes a HEase the phage sequence of gp126 Gizmo was transferred into the his-tag containing plasmid (PET14b). The protein has been expressed and purified. To test the activity of the HEase a substrate is being created that will allow the predicted function to be directly tested in an enzyme assay.

Poster Presentation P31

ISOLATION AND CHARACTERIZATION OF NEW BACTERIOPHAGES FOR *RHODOBACTER CAPSULATUS*

Brenda Miller and David Bollivar*

Biology Department, Illinois Wesleyan University

Six new bacteriophages that infect the photosynthetic α -proteobacterium *Rhodobacter capsulatus* were isolated from water samples collected downstream of the Bloomington-Normal Water Reclamation District. These phages were designated *Rc-Saxon*, *Rc-Spartan*, *Rc-Titan*, *Rc-Rhea*, *Rc-Cronus*, and *Rc-Oceanus*. Each phage produced circular plaques with morphologies varying in diameter and opacity. DNA was isolated from these phages using the purified high-titer lysate obtained during the isolation process. The isolated DNA from *Rc-Spartan* and *Rc-Saxon* was sent to the University of Pittsburgh, and the DNA from *Rc-Titan*, *Rc-Cronus*, *Rc-Rhea*, and *Rc-Oceanus* was sent to ACGT, Inc. to be sequenced. Genome sizes were all approximately 40,000 bp. *Rc-Spartan* and *Rc-Cronus* have been characterized at the molecular level, and draft genome sequences for the remaining phages are in the process of being assembled for characterization at the molecular level. These sequences will then be compared and examined to determine their phylogenetic relationships.

Poster Presentation P32

THE ROLE OF THE MEDIAL SEPTAL AREA IN REGULATING THETA RHYTHM IN THE ANTERIOR CINGULATE CORTEX

Alexandra Mitchell and Joseph Williams*

Psychology Department, Illinois Wesleyan University

The theta rhythm is an EEG brain wave pattern in the frequency range of 4-8 Hz that is thought to be involved in learning and memory. Previous research has indicated that the medial septal area (MSA) of the brain controls the theta rhythm in the hippocampus. The current study examines whether the MSA also regulates the theta rhythm in the anterior cingulate region of the prefrontal cortex. Four Long-Evans rats underwent surgical implantation of a recording electrode in the anterior cingulate cortex (ACC). A guide cannula was also inserted into the MSA to deliver various drugs to temporarily lesion the MSA. Substances delivered to the MSA included muscimol, which activates GABA receptors, scopolamine, which blocks acetylcholine receptors, and alcohol. Saline was also delivered as a control treatment. Theta rhythm in the ACC was recorded during administration of each treatment to determine if inactivation of the MSA decreased ACC theta power. Results will be discussed.

Poster Presentation P33

**OSTRICHES, HOUSE SPARROWS, AND CHICKENS...OH MY!
UTILIZING CORROSION CASTS TO VISUALIZE EGGSHELL
PORE MORPHOLOGY**

Jason Murphy, Mark Swanson and William Jaeckle* and Given Harper*
Biology Department, Illinois Wesleyan University

Avian eggshells serve the dual purposes of protecting the developing embryo from the external environment, while also facilitating the required exchange of CO₂, O₂, and H₂O gases. This trans-shell gas exchange is enabled by pores that span the eggshell. To visualize the three-dimensional morphology of eggshell pores we devised a novel application of PU4ii (vasQtec), a polyurethane-based resin which was originally developed to create replicas of the internal spaces of blood vessels. We applied liquid Pu4ii resin to the concave (inner) side of fragments of the eggshells of the ostrich (*Struthio camelus*), house sparrow (*Passer domesticus*), and the domestic chicken (*Gallus gallus*). After full resin polymerization (22 °C, 5 days), the hard CaCO₃ portions of eggshell were dissolved in 5% HCl (22 °C) and any residual organic material was removed using 10% NaOH (22 °C). The resulting casts were then rinsed with distilled water, freeze-dried, and examined using a JEOL-5800 scanning electron microscope. Eggshell pores of all three species were successfully cast and imaged. Casts of the pores of ostrich eggshells revealed a complex network of interconnected spaces, while pores of the eggshells of the domestic chicken and house sparrow were unbranched and varied in diameter throughout their length. This technique has many potential applications, including the calculation of more accurate estimations of gas flux across the shell than in previous studies, as well as comparisons of the distribution and morphology of eggshell pores among birds from different taxonomic groups.

Poster Presentation P34

ELLIPTIC CURVES AND CRYPTOGRAPHY

Linh Nguyen and Andrew Shallue*

Mathematics Department, Illinois Wesleyan University

An elliptic curve (E) over field K is the graph of an equation: (E): $y^2 = x^3 + ax + b$ (field $\neq 2, 3$) (discriminant $\Delta = 4A^3 + 27B^2$) where K is: complex numbers C, real numbers R, rational numbers Q, finite field(integers mod $p(F_p)$), etc. ; a and b are elements of K.

Cryptography plays an important role in today's world since security is one of the main concerns for the safety of everyone. In our current research project, we are considering using the Icart function to map the corresponding elements from the set of remainders mod p (p is a prime congruent to 2 mod 3) to the points(x,y) on the elliptic curve in order to encode the data. A survey will be presented on these topics, including information about the elliptic curves, Icart function and their application to the Diffie Hellman system.

Poster Presentation P35

TRUST-BASED RELATIONAL INTERVENTION (TBRI) FOR ADOPTED CHILDREN RECEIVING THERAPY IN AN OUTPATIENT SETTING

Lauren Nielsen and Robert Lusk*

Psychology Department, Illinois Wesleyan University

This study explored the relationship between Trust-Based Relational Intervention (TBRI) and treatment outcomes for adopted children participating in treatment services through The Baby Fold's Adoption Preservation Program. Adopted children who have trauma histories may have their adoptions disrupted if they do not receive the proper therapy to improve their overall functioning (Purvis, Cross, & Pennings, 2009; Davis, 1999). This study investigates a new intervention, TBRI, and its impact on children with trauma histories who are receiving outpatient therapy at a local child welfare center. Specifically, this study examines whether family functioning and child functioning are improved after receiving the intervention for six months. Results are analyzed and discussed, the clinical implications of findings are highlighted, and directions for future research are identified.

Poster Presentation P38

CARBON CHRONOSEQUENCE OF A NORTHERN LOWER MICHIGAN FOREST ECOSYSTEM

Stephanie Patton and Brian Walter^{1*} and Lucas Nave^{2*}

¹Biology Department, Illinois Wesleyan University

²Department of Ecology and Evolutionary Biology, University of Michigan Biological Station

Forests serve as an important terrestrial carbon (C) reservoir and an integral part of the global C cycle. Disturbances, such as harvesting, affect this cycle and decrease the ability of forests to sequester C. We measured a 128 year chronosequence of soil, root, and above-ground C storage in forest stands of northern lower Michigan, USA. All forest plots experienced a disturbance of clear-cutting from 3-128 years ago. The Oe horizon of the 128 year old stand had significantly greater C storage than younger stands. Mineral soil at 0-10 and 10-20cm showed a different C storage relationship than the organic soil horizons. There was no effect on C storage of soil depths greater than 20cm. Standing tree biomass increased asymptotically, but all other areas of C sequestration did not differ across stands. These results show that forests vary in their recovery from disturbance.

Poster Presentation P39

WHAT'S ON YOUR MIND?: FACEBOOK AND THE DEVELOPMENT OF SPANISH IDENTITY IN THE UNITED STATES

Kelsey Quitschau and Christina Isabelli*
Hispanic Studies Department, Illinois Wesleyan University

As the Spanish-speaking population in the U.S. continues to increase, researchers find more ways to observe and analyze the use and role of the first language in bilingual speakers. Various studies conclude that this population continues to use their first language in order to maintain their cultural identity while acculturating to their lives in the U.S. With the growing amount of social media outlets, bilingual Spanish-speakers in the U.S. are provided with more forms of expression and ways to create their cultural identity. This study attempts to analyze the creation of this identity through the language used on Facebook by five native speakers in the Northwest suburbs of Chicago. This study will show that these individuals possibly use their first language to show affiliation with other Spanish-speakers.

Poster Presentation P40

OPTICAL CLOAKING BY ABERATION CORRECTION

Joseph Richards, Julia Savich, and Gabriel Spalding*
Physics Department, Illinois Wesleyan University

Light incident on a material is scattered and then continues its propagation in seemingly random directions. If one can force light to pass through a material and not scatter, however, then one could “see” through the material. This scattering of light can be described as aberration within the light. A technique used for “Aberration Correction” is adding phase-shifts to regions of light allowing for all wave fronts of light to interfere in a constructive manner. This is accomplished in the use of a Spatial Light Modulator (SLM). The SLM, an array of linearly aligned crystals, allow for added phase shifts to light incident on the SLM. By shifting the phase of light, it is possible to allow light to pass through some material without having the light be scattered by the material. This case allows for one to “see” through the material, on account of the light passing through the material rather than being scattered by it. This technology has potential to be used for non-invasive surgeries as well as being a strong starting point for research into optical cloaking. If a procedure for allowing light to pass through a material is developed, then the procedure could be used for the purpose of Optical Cloaking. By expanding the region in which one “sees” through a material so that one encloses the entire material, one would cloak the entire material rather than “see” through some region of it. This procedure would have applications in both medical and military technology.

Poster Presentation P42

**AXONAL SPROUTING FROM CONTRALATERAL CORTEX
FOLLOWING MIMICKED COMPENSATORY REHABILITATION
AFTER STROKE**

Anjelica Rodriguez and Abigail Kerr*

Psychology Department, Illinois Wesleyan University

Rehabilitative strategies after stroke often fall short of the needs of stroke victims, such that they may be detrimental to recovery. For instance, compensatory training with the unaffected limb may lead to improved daily functioning, but may also prevent adequate recovery of the injured limb. We are looking into the anatomical mechanisms of compensatory rehabilitation using a rodent model of stroke. We mimicked compensatory training that is seen in rehabilitative therapies after stroke using C57BL/6 mice. These mice were trained on a skilled reaching task with their dominant limb before stroke was induced. After stroke, the mice received post-operative behavioral training that mimicked compensatory training. That is, mice were forced to use the non-dominant limb (i.e. good limb, contralateral to stroke, less-affected limb) during daily skilled reach training or no reach training (control). Mice that received good limb training had impaired functioning of the bad limb compared to controls that received no initial good limb training. This behavioral effect persisted with as many as 28 days of focused training of the bad limb. Mice were then sacrificed and their brain tissue was sliced and processed with immunohistochemical staining. Axonal proteins were targeted using anti-Pnf-h, and axonal growth inhibitory proteins were targeted with anti-Nogo-A. The number of axons crossing between hemispheres was quantified in the corpus callosum along with the number of axons surrounding the lesion. Growth inhibitory proteins were quantified around the lesion.

Poster Presentation P44

OSTRACISM: HOW WITNESSING THE PERPETRATORS INFLUENCES SUBSEQUENT EXPERIENCES OF THE TARGET

Roberto Romay and Jason Themanson*

Psychology Department, Illinois Wesleyan University

Ostracism refers to being ignored or excluded by others. Ostracism is common among social groups and victims of ostracism suffer a variety of negative consequences. Although humans see it perpetrated everywhere, little research has examined the effect of observing ostracism on one's thoughts, feelings, and behaviors. Our project examines how witnessing ostracism influences a person's subsequent neural and behavioral reactions to being the target of exclusion. Measures of neural activity were obtained from participants while engaged in computerized social interaction (Cyberball). Self-report measures of emotional states and levels of distress were collected following the interaction. Two hypotheses are considered. If the heightened affective state brought on by witnessing exclusion persists, then participants who witness exclusion will exhibit increased distress and associated neural activity during their exclusion experience. Alternatively, if self-regulatory processes are activated, then participants who witness exclusion will exhibit decreased distress and associated neural activity during the experience.

Poster Presentation P45

A TYPOLOGY OF WRITTEN SPANISH OF JUNIOR HIGH BILINGUAL STUDENTS IN CENTRAL ILLINOIS

Stephanie Schwingle and Christina Isabelli*
Hispanic Studies Department, Illinois Wesleyan University

In sociolinguistic studies on bilingual speakers, studies have focused on oral language usage. Few conduct studies on the written usage of bilingual speakers, especially in smaller communities with concentrated populations of Spanish-speakers. This study focuses on a typology of written Spanish, regarding the use of lexicon, syntax and code switching of junior high bilingual-speakers in Central Illinois. The data will be collected using open-ended prompts that are to be responded to in Spanish. The responses will evidence written language usage, regarding the aforementioned characteristics, and give insight to written language ability of the Spanish speakers.

Poster Presentation P46

CREATING AND IMPLEMENTING A TEACHING MODULE FOR THE HIGH SCHOOL BIOLOGY CLASSROOM

Elizabeth Smith and William Jaeckle*
Biology Department, Illinois Wesleyan University

The “nature of science” is an educational concept that encourages science teachers to teach students about the origin, nature, methods, and limits of human knowledge. One way for students to experience the nature of science is through the creation and implementation of hands-on experiments. As a future biology teacher, I created a teaching module that incorporates an inquiry-based experiment that could be implemented into a high school biology curriculum. In this experiment, egg masses from the locally common freshwater snail *Physa acuta* were used to test the effect of rearing temperature on the rate of embryo development and survival. Within each egg mass are embryos that are contained within separate capsules. Materials present within the capsule nourish the developing embryo. For this teaching module, a detailed protocol was developed and then implemented by students enrolled in Biology 209 (Biostatistics and Experimental Design). Groups of students collected egg masses (<24 hours old), divided each mass into two pieces with a similar number of egg capsules, photographed and measured each capsule, and distributed each ½ mass into a reference temperature incubator (23°C), and either a low (20°C), or high (26°C) temperature incubator. Students examined each ½ egg mass until offspring hatched from the capsule as juvenile snails or died; the date and time of each examination was recorded. At the end of the collection period, each group of students will use statistical tests to examine the effect of rearing temperature, the snail mother, egg capsule size, and embryo size on the time to hatching among all egg masses. To evaluate the pedagogical value of this experience, each student will complete a questionnaire to assess directly how this exercise influenced their understanding of experimentation and quantitative analysis.

Poster Presentation P47

**THE USE OF DISCOURSE MARKERS *SO* AND *ENTONCES* OF A
SPANISH-ENGLISH BILINGUAL SPEAKER**

Chloe Staub and Christina Isabelli*

Hispanic Studies Department, Illinois Wesleyan University

A 2008 study on the use of discourse markers *so* and *entonces* suggests that markers from one language may replace markers from the other (Potowski). While this provides a foundation for further research, there has yet to be a study that takes into account possible psychological factors behind marker usage throughout a conversation. This study will not only account for the function of markers *so* and *entonces*, but also the emotion of the speaker in that moment of use, and the surrounding content of the conversation. Data will be collected through two fifteen-minute interviews with a bilingual individual. The goal will be to explore the connection between emotion, content, and marker function with the usage ratio of *so* to *entonces*. A description of these potential connections may provide insight into the psychology behind this widespread form of code-switching.

Potowski, K. (2008). A comparative study of bilingual discourse markers in Chicago Mexican, Puerto Rican, and MexiRican Spanish. *International Journal of Bilingualism*, 12(4), 263-279.

Poster Presentation P48

EFFECT OF THREE INFORMATIONAL STRATEGIES ON COWORKER ATTITUDES TOWARDS HIRING PEOPLE WITH AUTISM

Kathryn Thomas and Linda Kunce*

Psychology Department, Illinois Wesleyan University

Misconceptions and stereotypes about disabilities are often the largest obstacle to the hiring of people with disabilities. Vocational rehabilitation professionals have argued that employers should be given information about the benefits of hiring people with disabilities to counteract inaccurate knowledge about disabilities. The present experiment is designed to examine the efficacy of informational passages with respect to influencing behavioral intentions toward hiring people with autism spectrum disorder (ASD). This study is grounded in the Theory of Planned Behavior (Ajzen, 1985, Ajzen, 1991), which has been used to help researchers and applied professionals better understand employers' intentions to hire people with disabilities (Fraser et al., 2011). Results showed a significant gender effect such that women tended to be more positive towards hiring initiatives for people with ASD than men. Providing information about business benefits significantly improved men's reactions to hiring initiatives without significantly changing women's reactions.

Poster Presentation P49

CAN MUSICIANS TELL SHARP FROM FLAT?

Cathryn Volk and Joseph Plazak*
School of Music, Illinois Wesleyan University

A musician's awareness of intonation (i.e. "being in tune") is an important skill. While musicians are highly sensitive to "out of tune" notes, research suggests that this sensitivity is categorical rather than absolute (Siegel & Siegel, 1977). If intonation is heard "categorically," musicians' classification of intonation errors (both magnitude and direction), would be expected to be poor. This experiment was designed to determine whether or not musicians could categorically perceive mistuned musical intervals, as well as to investigate the relative limits of absolute intonation perception. Ten undergraduate music students were tested on their ability to identify intonation errors within an 3AFC paradigm. The results found that while participants were able to identify mistuned intervals, they struggled to correctly identify the directionality of these intonation errors. The results are consistent with the hypothesis that musicians perceive intonation "categorically," and more specifically, that they struggle to hear the difference between sharp and flat intervals.

Poster Presentation P50

MULTIFIBER ELECTRODES FOR THE DIRECT DETECTION OF NEUROTRANSMITTER RELEASE FROM TASTE BUDS

Stephen Whitfield and Melinda Baur*

Chemistry Department, Illinois Wesleyan University

Mammalian taste buds are known to contain releasable stores of norepinephrine (NE) and serotonin (5-HT), both of which are electroactive neurotransmitters amenable to detection by amperometry and cyclic voltammetry. However, repeated attempts to detect the release of NE and 5-HT in isolated mouse taste buds (approx. width of 50-70 μm) with single carbon fiber electrodes have been unsuccessful. The taste bud is a tight collection of 50 to 100 taste cells, only about 20 percent of which contain NE and 5-HT, and therefore the probability of positioning a single carbon fiber electrode (5-7 μm in diameter) at a release site is very low. We have found that it is possible to greatly increase the probability of finding release sites using carbon fiber electrodes containing approximately 10 to 40 carbon fibers, each having a diameter of 7 μm . These multifiber electrodes have overall diameters between 30 and 70 μm (including the glass insulating sheath) and therefore cover between 50 and 100% of the exposed surface of the taste bud. It was possible to use amperometry at these electrodes to directly detect calcium-dependent vesicular release of neurotransmitter by depolarization with KCl and by stimulation with sweet, sour, and bitter tastants. Furthermore, we have used this approach to demonstrate that mouse taste buds release neurotransmitters in response to stimulation by linoleic acid. These results demonstrate that multifiber electrodes promise to be important tools for investigating the sense of taste and the mechanism of neurotransmission between taste cells and between the taste buds and the afferent neuron. Additionally, multiple-chamber multifiber electrodes are in development which will allow for simultaneous, independent assessment of distinct areas of the taste bud.

Poster Presentation P51

NEURAL ACTIVITY IN A CHAT ROOM ENVIRONMENT

Victoria Whitaker and Joseph Williams*

Psychology Department, Illinois Wesleyan University

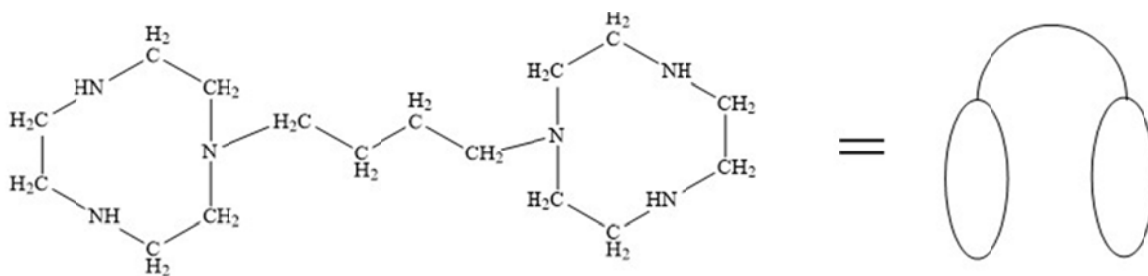
The present study used a chat room paradigm to examine the effects of social ostracism on brain activity in the frontal lobe via EEG. Previous research has suggested that frontal lobe activity changes during the experience of social ostracism. Participants were placed in a chat room with two other individuals. Unknown to participants, these individuals were actually confederates in the study. This experiment consisted of three primary phases. In the first phase, confederates actively included the participant in the chat room conversation. In the second phase, they were completely ignored (social ostracism). Confederates re-included the participant in the last phase of the chat room conversations. The purpose of the present study was to investigate what variables may influence the experience of social ostracism, such as gender and attractiveness of the ostracizing students.

Poster Presentation P52

THE DEVELOPMENT OF A SUPRAMOLECULAR RECEPTOR FOR ENVIRONMENTALLY FRIENDLY OXIDATION CATALYSTS

Xuewen Zhou, Ruomeng Zhang and Rebecca Roesner*
Chemistry Department, Illinois Wesleyan University

Polyoxometalates (POMs) are anionic, metal-oxygen clusters with large, spherical, cage-like structures. The Keggin structure is one of the best-known POM structures. POMs are environmentally benign oxidation catalysts that can activate green oxidizing reagents such as oxygen and hydrogen peroxide. POMs have been widely used for bleaching paper pulp, treating organic dye pollutants, and converting solar energy to chemical energy. After a chemical process complete, POMs can be extracted from the mixture and recycled for future use. Our research focuses on building macrocyclic receptors to be used for recognizing and recovering POMs. The receptor molecule currently under investigation has an earmuff shape and consists of two triazacyclononane (TACN) units that are bridged together using a hydrocarbon chain. The TACN units will be protonated at low pH and their resulting positive charge will attract the POMs. The length and structure of the bridge can be modified to accommodate POMs of different sizes and charges.



EDUCATIONAL STUDIES

POSTER PRESENTATIONS - SESSION 1

**April 11, 2014, 4:00 – 5:00 pm
AMES LIBRARY BASEMENT**

- 1.1 Kelsey Quitschau
- 1.2 Callie Ault
- 1.3 Matthew Conrad
- 1.4 Cassandra Anderson and Tara Drazner
- 1.5 Aaron Guenther
- 1.6 Athena Cocallas
- 1.7 Brady Olson
- 1.8 Danielle Burge
- 1.9 Kyle Pfister
- 1.10 Amanda Watts

ORAL PRESENTATIONS - SESSION 2

**April 11, 2014, 5:00 – 6:00 pm
BECKMAN AUDITORIUM
MODERATOR: VICTORIA HALEVY**

- 2.1 Andrea Cain
- 2.2 Kristen Woodside
- 2.3 Briana Yarwood

POSTER PRESENTATIONS - SESSION 3
April 11, 2014, 6:00 – 7:00 pm
AMES LIBRARY BASEMENT

- 3.1 Lindsey Bakewell
- 3.2 Shelby Kottemann
- 3.3 Kathryn Robinette
- 3.4 Erica Vrkljan
- 3.5 Matthew Simon
- 3.6 Victoria Halevy
- 3.7 Elizabeth Smith
- 3.8 Baylie Gregurich
- 3.9 Ryan Smith
- 3.10 Julieanne Sthay
- 3.11 Brynn Tomko

Poster Presentation ES P1.1

**BRINGING LANGUAGE TO LIFE:
CULTURE IN FOREIGN LANGUAGE LEARNING**

Kelsey Quitschau and Jeanne Koehler*

Educational Studies Department, Illinois Wesleyan University

Culture is often an afterthought in the high school Spanish classroom given the emphasis on reading and writing in a foreign language. Lexical and grammatical components of the language overshadow the inclusion of the Spanish culture. Several researchers, however, have conducted studies and presented data arguing that the incorporation of culture into the curriculum is necessary. Cultural information may increase student engagement in the classroom, as well as lead to higher communicative competence. In this literature review of educational research, I explored the relationship between culture and language and the benefits of incorporating culture into foreign language learning. Based on the literature, I have developed lesson plans that integrate cultural aspects of the target society into the curriculum in order to bring the language to life in the classroom.

Poster Presentation ES P1.2

ACCOMMODATING FOR DIVERSE LEARNING NEEDS THROUGH DIFFERENTIATED INSTRUCTION IN THIRD GRADE MATHEMATICS

Callie Ault and Leah Nillas*

Educational Studies Department, Illinois Wesleyan University

Differentiated Instruction (DI) is a method of instruction that applies accommodations based on the strengths and weaknesses of diverse learners (Tomlinson, 2001). As a student teacher in an urban third grade classroom, I recognized my students' diverse learning needs and wanted to meet those needs through differentiated instruction in the mathematics curriculum. I developed a plan to differentiate mathematics lessons and used content analysis (Neuendorf, 2002) to discover effective techniques of implementing differentiated instruction. I analyzed qualitative data such as lesson plans, observation notes, and students work for differentiating strategies including visual learning, verbal or auditory learning, individualized instruction, and managing student anxiety. My findings suggest that mathematics performance is positively influenced by the proper implementation of differentiated instruction, based on students' individual learning needs.

Poster Presentation ES P1.3

**COOPERATIVE LEARNING AND PROBLEM SOLVING:
DECREASING STUDENT ANXIETY IN THE HIGH SCHOOL
MATHEMATICS CLASSROOM**

Matthew Conrad and Jeanne Koehler*

Educational Studies Department, Illinois Wesleyan University

In the high school classroom, students overcome with math anxiety face extreme difficulty acquiring new math facts and skills. Anxiety levels are exasperated by the growing number of standardized tests. Student failure only breeds greater anxiety and places students further and further behind. Research focused on math anxiety indicates a cooperative learning classroom can give students a chance to become more engaged and more involved in their learning process and decreases their anxiety. In this literature review of educational research, I explored factors that contribute to student anxiety and possible teaching techniques that can effectively minimize it. Based upon the empirical research, cooperative learning and opportunities for problem solving are two ways in which math teachers can minimize student anxiety. To expand this research, I have explored literature on how technology can be used to increase student opportunities for collaboration and problem solving.

Poster Presentation ES P1.4

TOTAL PHYSICAL RESPONSE: SHAKING UP THE CLASSROOM

Cassandra Anderson, Tara Drazner and Leah Nillas*
Educational Studies Department, Illinois Wesleyan University

Traditional classroom settings cater towards audio and visual learners and often ignore the needs of kinesthetic learners. This may cause students to fall behind due to content lessons not being aligned with their learning styles. During Cassandra and Tara's student teaching experience, they addressed the diverse needs of all students in their classrooms. They conducted self-studies in which they integrated Totally Physical Response (TPR) in first and fifth grade classrooms. Cassandra integrated TPR into five lessons and Tara integrated TPR into three lessons. They content analyzed major data sources such as video and audio recordings, photographs, lesson plans, and field logs. Additional data sources included sample student work and students' responses to questionnaires. TPR integration through dance, drama and reader's theater supported improvement in student behavior and the mastery of content. The needs of all students were met when TPR was integrated in the content areas.

Poster Presentation ES P1.5

**WATCHING YOUR WAY TO LITERACY:
USING FILM IN THE ENGLISH CLASSROOM**

Aaron Guenther and Jeanne Koehler*

Educational Studies Department, Illinois Wesleyan University

High school students who struggle with low literacy often face repeat failures in the English classroom. Teachers of low literacy students who have incorporated film when teaching texts have found that including both may increase motivation, interest, and literacy levels. In this qualitative self study of student teaching, I examined how to effectively include film when teaching texts in the English classroom. Based upon field notes and student exams, I found the use of film filled comprehension gaps and engaged students more deeply with the text. This self study lends support to prior research.

Poster Presentation ES P1.6

USING MOBYMAX TO DIFFERENTIATE ELEMENTARY MATHEMATICS INSTRUCTION

Athena Cocallas and Leah Nillas*

Educational Studies Department, Illinois Wesleyan University

Using technology as a tool to differentiate instruction in a classroom meets the needs of many students by increasing interest and motivation and connecting the students to the material (Morgan, 2014). The purpose of my self-study is to determine the benefits of using technology as a tool in differentiating mathematics instruction. I implemented MobyMax, an online intervention program with progress monitoring, into a 4th grade classroom every day for three weeks. MobyMax provides differentiated curriculum based on a test each student takes at the beginning and a series of ability level dependent assessments students take throughout the year. The students worked on the program for a minimum of 20 minutes of mathematics instruction everyday during school, and if possible, at home. I wrote field notes about six specific students, noted the numbers of correct problems that all students completed in a week, and collected other quantitative data recorded by MobyMax. I quantitatively analyzed these data sets to show that students met the Common Core Math State Standards that they had not previously mastered.

Poster Presentation ES P1.7

MATHEMATICAL TEAMWORK: COLLABORATIVE LEARNING IN THE HIGH SCHOOL CLASSROOM

Brady Olson and Jeanne Koehler*

Educational Studies Department, Illinois Wesleyan University

Picture a typical high school mathematics classroom: students suffer from anxiety, are disengaged, and struggle to communicate with one another about the content. Education researchers have found benefits with incorporating collaborative learning including increased confidence levels, expansion of positive problem solving attitudes, interpersonal skills, and an increased sense of excitement towards mathematics. My qualitative self study investigated how to effectively integrate collaboration to maximize its benefits in my classroom. Through analyzing observational field notes, lesson plans, and candid pictures of group activities, I found students actively cooperated to problem solve, students developed a sense of teamwork in order to find success with math, and students gained independence and moved away from reliance upon the teacher. Overall, as the students become more comfortable with cooperation, the more productive the collaborative learning activity can be.

Poster Presentation ES P1.8

VALUING LEARNING STYLES' ROLE IN STIMULATING POSITIVE LEARNING EXPERIENCES

Danielle Burge and Leah Nillas*

Educational Studies Department, Illinois Wesleyan University

“The basic idea of learning styles is that different people have different ways of learning, and if instruction is matched to the individual’s styles, he or she should learn better” (Bishka, 2010, p. 10). Students establish these personal ways of learning by determining which method of learning best suits them. Educators can assist students in seeking their personal preferences by providing them with different learning environments and finding which one best suits them. In this review of literature on learning styles, I analyzed and synthesized several research studies focusing on the significance of different learning styles, student preferences and approaches to personal learning, and different methods of strategies used in the classroom when assessing learning styles. With the information presented in this review, assessing different learning styles, determining student preferences or approaches to learning, and using alternate strategy, teachers can provide supportive learning environment to stimulate successful learning experiences.

Poster Presentation ES P1.9

**BRINGING THE PAST TO PRESENT: INCORPORATING
TECHNOLOGY IN PRIMARY SOURCE LEARNING**

Kyle Pfister and Jeanne Koehler*

Educational Studies Department, Illinois Wesleyan University

In the high school history classroom, effective incorporation of technology in primary source learning is an infrequently tapped well of possibilities. Teachers often become rooted in traditional methods of history education which isolates a new generation of students. Due to lack of knowledge, implementation, and planning, technology is being underutilized as a way of teaching using primary sources. History teachers who blend technology and primary sources find students more motivated and engaged while promoting higher level critical thinking skills. In this literature review, I explored empirical studies of how educators incorporated technology in their classrooms as well as the success and failures of teaching history using primary sources. Based upon the literature, I found that teacher ability and effective planning were critical to success.

Poster Presentation ES P1.10

READING WITHOUT UNDERSTANDING: LITERACY IN THE SECONDARY HISTORY CLASSROOM

Amanda Watts and Jeanne Koehler*

Educational Studies Department, Illinois Wesleyan University

In high schools today, students are struggling with literacy despite its increased importance. Although performance on various standardized tests indicates the prevalence of this issue, many teachers are uncertain about how to address it. Teachers who incorporate various literacy strategies, both general and disciplinary, assist students in developing these crucial literacy skills. In this qualitative self study of student teaching, I explored the use of different literacy techniques in a high school history classroom. I incorporated active reading strategies, graphic organizers, political cartoons, and disciplinary literacy. Based upon my observations and student work samples, my preliminary findings indicate that different methods appeal to different students. As a result, including various strategies in the history classroom may be important to helping improve literacy levels in a diverse classroom of learners.

Oral Presentation ES O2.1

**THE ART OF MATHEMATICS: INCORPORATING FINE ARTS
INTO THE SECONDARY MATH CLASSROOM**

Andrea Cain and Jeanne Koehler*

Educational Studies Department, Illinois Wesleyan University

In the high school mathematics classroom, students appear apathetic toward a topic they view as rigid. Students rarely view math as a subject for expressing creativity or exploring the world around them. Teachers who include more artistic and creative lessons are finding that their students' interest in math increases and their academic progress follows (Khan 2010). In this qualitative self-study of student teaching, I explored how to integrate fine arts within math lessons. Based upon student feedback, field notes, and research, I found the fine art activities connected to math instruction improved student interest and engagement with the lessons. While the critique of this type of integration is that it may interfere with skill development, I found fine arts may motivate students to learn new math skills.

Oral Presentation ES O2.2

STUDENTS ASK THE QUESTIONS: USING STUDENT-GENERATED QUESTIONS TO FACILITATE CLASSROOM DISCOURSE

Kristen Woodside and Leah Nillas*

Educational Studies Department, Illinois Wesleyan University

Student-generated questions help students understand teacher expectations, develop their thinking, and comprehend subject matter, and allow teachers to plan lessons that meet students' needs and interests (Almeida, 2010). In an effort to generate student questions during my student teaching in a fourth grade classroom, I implemented a self-study in which I encouraged my students to generate their own questions in language arts. I taught them what a higher order question is (Bloom's Taxonomy, 1965) and provided them opportunities to generate such questions at the end of multiple lessons. Students participated in a full-class discussion where they generated and discussed their questions with each other. Through field notes and student work samples, I found that my students were successful in generating higher order questions. Audio recordings and an end of semester student questionnaire showed that students were engaged and excited about participating when they were able to discuss their own questions.

Oral Presentation ES O2.3

CHOREOGRAPHING A CLASS: INCORPORATING MOVEMENT INTO THE SECONDARY ENGLISH LANGUAGE ARTS CLASSROOM

Brianna Yarwood and Jeanne Koehler*

Educational Studies Department, Illinois Wesleyan University

At the high school level, students are expected to remain stationary for nearly eight hours a day, making it difficult for students to pay attention and engage with the material in classes, including English class. Recent research suggests that incorporating movement in the high school English classroom can be beneficial to students' physical well being as well as their comprehension, retention, and enjoyment of course content. In this qualitative self study of student teaching, I used my background as a dancer to explore how introducing movement can further understanding of course material and increase engagement. Based on field notes, in-class activities, and student feedback, I found that using the traditional classroom space in unconventional ways to encourage mobility engaged students and improved their understanding of course content.

Poster Presentation ES P3.1

**COMPREHENDING MATHEMATICS:
IMPROVING STUDENTS' MATH LANGUAGE**

Lindsey Bakewell and Jeanne Koehler*

Educational Studies Department, Illinois Wesleyan University

High school mathematics teachers tend to focus on teaching computations rather than focus on mathematical vocabulary development. Using strategies that allow students to increase their communication of mathematics has been shown to help students develop mathematical vocabulary while also strengthening their computational abilities. In this qualitative self-study of student teaching, I explored how to implement certain instructional strategies to enhance students' vocabulary acquisition. Based on lesson plans, field notes, pretests, posttests, and student work, I found giving students opportunities to communicate using the math language and through various means helped to improve student knowledge of mathematical vocabulary.

Poster Presentation ES P3.2

DIFFERENTIATION STRATEGIES THROUGH READING CENTERS

Shelby Kottemann and Leah Nillas*

Educational Studies Department, Illinois Wesleyan University

“As the diversity of the K-12 student population increases, it is critical that teachers differentiate their instruction to meet all students’ needs” (Parsons, 2013, p.42). In an effort to determine how I can differentiate language arts instruction for a diverse group of students, I conducted a self-study through reading centers in a first grade classroom. I began by assessing my students’ intelligences according to Gardner’s Multiple Intelligences Theory, and I observed each student, taking note of their habits and tendencies in the classroom. I used this data collected on students’ learning tendencies and intelligences to place them into groups and plan language arts lessons for reading centers. In these lessons, I explored the various ways I could differentiate for different types of learners, such as incorporating movement in teaching kinesthetic learners and oral discussion with auditory learners. Examining the data I collected from video recordings of these lessons, samples of student work, and my own personal field notes, I identified the strategies I used to differentiate my instruction for students. The results that I gleaned from this research illuminate methods a teacher can use in order to implement differentiation in their own first grade language arts classroom.

Parsons, S. A., Dodman, S. L., & Cohen Burrowbridge, S. (2013). Broadening the view of differentiated instruction. *Phi Delta Kappan*, 95(1), 38-42.

Poster Presentation ES P3.3

INFLUENCING STUDENT LITERACY: AUTHENTIC TEXTS IN THE SPANISH SECONDARY CLASSROOM

Kathryn Robinette and Jeanne Koehler*

Educational Studies Department, Illinois Wesleyan University

In the secondary Spanish classroom, students struggle to acquire literacy given the mandatory requirement to take Spanish and the prescribed curriculum. Educators who incorporate authentic texts into their academic teaching find these texts improve student literacy and engagement. In this qualitative self-study of student teaching, I explored how to successfully integrate authentic texts in the Spanish classroom as well as what the benefits of including these texts. Based upon student feedback, field notes, and research, I discovered authentic resources positively impacted student language comprehension as well as conversational Spanish.

Poster Presentation ES P3.4

TECH-TALK: USING TECHNOLOGY TO TEACH BILINGUAL STUDENTS

Erica Vrkljan and Leah Nillas*

Educational Studies Department, Illinois Wesleyan University

Technology used in a constructive way, such as the interactive whiteboard (IWB), effectively diminishes the reading achievement gap between English language learners (ELL) and non-ELL students (Lopez, 2009). Within the last decade, the variety of available technologies for the classroom has grown significantly, while the presence of English language learners and English as a second language (ESL) students has also experienced a significant increase within our nation's schools. This self-study was designed in response to these changes by investigating how technology can be used to teach language arts skills to bilingual students. The technologies of SMARTboard, iPad, and Internet websites were utilized to teach the language arts concepts of setting, sequence of events, and phonemic awareness to bilingual kindergarten students. Through content analysis of field notes, student work samples, and questionnaires, the researcher hoped to determine how the use of technology enhances students' application of language arts skills. This researcher also wished to explore the students' perceptions of using technology for learning. The integration of technology can significantly improve ELL and ESL students' comprehension of language arts skills while addressing their unique needs as learners.

Poster Presentation ES P3.5

ENGAGING IN HISTORY THROUGH DEBATE: IMPROVING STUDENT ENGAGEMENT AND CITIZENSHIP SKILL DEVELOPMENT

Matthew Simon and Jeanne Koehler*

Educational Studies Department, Illinois Wesleyan University

Teachers in the high school history classroom often employ traditional methods of teaching that fail to engage students in meaningful thinking or engagement in the material. Through incorporating debate in the history classroom, teachers have found that student engagement improves and that students develop the skills to be effective citizens in a democracy. In this qualitative self-study of student teaching, I inquired how to effectively incorporate debates into the history classroom and how to focus on student engagement and citizenship skills. Based upon lesson plans, field notes and videos from student teaching, I found that debates improved student engagement and provided opportunities for students to build citizenship skills.

Poster Presentation ES P3.6

EMPOWERING STUDENTS WITH CLASSROOM LEADERSHIP OPPORTUNITIES

Victoria Halevy and Leah Nillas*

Educational Studies Department, Illinois Wesleyan University

Modern classrooms place an emphasis on incorporating student voice and student leadership in the classroom. Increasing student leadership opportunities helps students learn citizenship, practice participation, and experience agency (Morrison, 2008; Thomson, 2012). The purpose of this study is to examine the ways students responded to the challenge of leadership opportunities when they were presented in the classroom. This self-study was conducted in a self-contained 5th grade urban classroom. Students practiced leadership opportunities by setting goals, participating in collaborative social-emotional learning, and applying for leadership positions in the classroom. Data sources included teacher notes about conferences with students, student leadership role applications and teacher field notes. In order for students to rise to leadership opportunities, the teacher needed to make leadership a priority in the classroom by incorporating it into daily classroom routines. Once the teacher made leadership part of the school routine, students fulfilled leadership roles in the classroom and suggested their own ideas for leadership roles and activities.

Poster Presentation ES P3.7

**SNAILS? INCORPORATING THE NATURE OF SCIENCE AND
PRIMARY LITERATURE INTO THE
HIGH SCHOOL BIOLOGY CLASSROOM**

Elizabeth Smith and Jeanne Koehler*

Educational Studies Department, Illinois Wesleyan University

In the high school Biology classroom, science is taught to be fixed, unchanging, and uninteresting to students. By incorporating the Nature of Science and primary literature articles into the science classroom, students can delve deeper into the ever-changing biology curriculum while also becoming a part of the scientific community. Teachers who incorporate these aspects into their academic teaching are finding that students are retaining the curriculum as well as probing deeper into the content by asking more thought-provoking questions (Handler & Duncan, 2006; Brill & Yarden, 2003). In this literature review of educational research, I explored how incorporating the Nature of Science and primary research articles benefitted high school biology students. Based upon the literature, I have developed lesson plans that integrate the Nature of Science into the high school biology classroom.

Poster Presentation ES P3.8

TEACHING SOCIAL JUSTICE ISSUES USING INFORMATIONAL TEXTS

Baylie Gregurich and Leah Nillas*

Educational Studies Department, Illinois Wesleyan University

In response to the increasing diverse population of the world and in our schools, it is necessary that teachers modify their instruction to prepare students to become accepting and respectful citizens in our society. For this self-study, I designed lessons to accommodate the new requirement of using *informational texts* in the classroom while simultaneously enriching my elementary students' knowledge on social justice issues. I implemented a three-lesson language arts unit with a focus on identifying the main idea and details of *informational text*. Each *informational text* introduced one of the following social justice issues — family differences, world's children, and houses of the world. Per lesson, I collected students' work that assessed their understanding of identifying the main idea and details. I documented and reflected upon class discussions of each of the three social justice issues using video or audio recordings, and also photographed the texts that were used in instruction. Some teachers avoid incorporating social justice issues in their lesson plans due to their belief that younger students are not ready for such complex and meaningful discussion. However, I found that creating lesson plans that use *informational texts* with social justice themes was an effective way to accommodate the Common Core State Standards while enhancing students' understanding of social justice issues.

Poster Presentation ES P3.9

**MOTIVATION IN AN URBAN HIGH SCHOOL MATH CLASSROOM:
DIFFERENT INSTRUCTIONAL STRATEGIES
AND IMPLEMENTING TECHNOLOGY**

Ryan Smith and Jeanne Koehler*

Educational Studies Department, Illinois Wesleyan University

Urban students who struggle with student motivation and academic performance in the mathematics classroom often indicate that the subject is boring and not connected to their lives. Educational research suggests implementing different instructional strategies and incorporating technology address issues of student motivation and engagement. In this qualitative self study during student teaching, I researched how to effectively implement various instructional strategies and how to design more engaging lessons. The findings indicate that different instructional approaches as well as math problems connected to student interests help increase student engagement in the math classroom.

Poster Presentation ES P3.10

HARMONIC LANGUAGE ARTS: MUSIC INCLUSION IN THE SECONDARY ENGLISH LANGUAGE ARTS CLASSROOM

Julieanne Sthay and Jeanne Koehler*

Educational Studies Department, Illinois Wesleyan University

Students are required to take four years of high school English, and the mandatory nature of English coupled with a scripted curriculum negatively impact student interest and motivation. English teachers who incorporate music into their academic teaching are finding music can improve student engagement, motivation, and learning (Goering & Burenheide, 2010). In this qualitative self study of student teaching, I explored questions including whether the addition of music is worthwhile in the English classroom, how it can be done, and what the benefits and drawbacks of doing so are. Based upon field notes, lesson plans, student feedback and research, I found particular music categories worked best to connect students' lives with their learning and helped motivate them in the classroom.

Poster Presentation ES P3.11

**¿Qué pasa Dude? : GETTING STUDENTS TO CONVERSE IN SPANISH
BEYOND THE CLASSROOM**

Brynn Tomko and Jeanne Koehler*

Educational Studies Department, Illinois Wesleyan University

In the Spanish foreign language classroom, traditional teaching methods leave students anxious and uninterested in the study of the language and prevent them from speaking and acquiring the language. Research shows teachers who incorporate communicative teaching methods with technology into the foreign language classroom find focusing on communication improves students' motivation and self-esteem as well as increases their fluency in the language. In this qualitative self-study of student teaching, I integrated communicative teaching methods through conversational language with use of wikispaces and Skype in a Spanish 3 classroom in order to explore their effect on their acquisition of Spanish. Based upon data from my field notes and student work, I found conversational CLT methods improved student motivation and increased the usage of the language both inside and outside of the classroom.