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John Wesley Powell Student Research  
Conference

2010, 21st Annual JWP Conference

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Apr 10th, 8:30 AM - 4:00 PM

## Complete 2010 Program

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CENTER FOR  
NATURAL SCIENCES  
**SATURDAY**  
**APRIL 10, 2010**

<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-First Annual**

**John Wesley Powell • IWU**

# **Student Research Conference**

**Center for Natural Sciences and Ames Library**

**Saturday, April 10, 2010**

**8:30 a.m. – 4:00 p.m.**

***Official Program***

## **ACKNOWLEDGEMENTS**

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

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

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

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

John Wesley Powell Research Conference Committee:

- David Vayo (Music)
- Melinda Baur (Chemistry)
- Amit Ghosh (Economics)
- Jeungbo Shim (Business Administration)

## **SCHEDULE OF EVENTS**

**Saturday, April 10, 2010**

8:30 a.m.	Continental Breakfast and Poster Setup	Science Commons and Ames Library
9:00 a.m.	Poster Session A Educational Studies Posters	Science Commons Ames Library
10:00 a.m.	Oral Presentations – <i>Session One</i> Sessions 1 through 5	CNS
11:00 a.m.	Oral Presentations – <i>Session Two</i> Sessions 6 through 9	CNS
11:00 a.m.	Music Student Composition Performance	CNS C101
12:15 p.m.	Luncheon	Main Lounge
1:30 p.m.	Keynote Address: Timothy Zwier	Anderson Auditorium-CNS C101
2:30–3:45 p.m.	Poster Session B	Science Commons
2:30–4:00 p.m.	Senior Art Show and Critique	Merwin and Wakeley Galleries

**KEYNOTE SPEAKER**

**“THE HAPPY MARRIAGE BETWEEN LASER AND SUPERSONIC EXPANSION”**

Dr. Timothy Zwier

1:30 p.m. Anderson Auditorium (C101)

Dr. Timothy Zwier is the M. G. Mellon Distinguished Professor of Chemistry at Purdue University.

He leads a research program at the interface of chemistry, physics, and biochemistry. He is currently receiving research funding from the National Science Foundation, the Department of Energy, and NASA. Projects in his group include using molecular spectroscopy to study conformations and hydrogen bonding in biomolecules, photochemistry of small hydrocarbons found in planetary atmospheres, and chemical isomerization processes that lead to aromatic ring formation in combustion.

Some of Dr. Zwier's most recent publications include articles in Science, The Journal of the American Chemical Society, and the Journal of Physical Chemistry.

## STUDENT PARTICIPANTS

### Oral and Poster Presentations

Linda Agyapong	P2	Emily Houk	ES
Veronica Angeles	P1, P34	Catherine Hunter	O5.2
Elizabeth Ave Maria	P3	Mujtaba Ali Isani	O4.1, O6.3
Caitlin Barnes	ES	Emily Jones	O1.1
Kyle Beasley	P4	Amy Kapp	P24
Kristina Bennett	P5	Miranda Kiefer	P10
Matt Berg	P6	Kyleigh Kirbach	P25
Thomas Bersano	P7	Rosa Kleinman	O5.4
Susan Blunck	O1.1	Cory Kline	P26
Natalie Boesche	ES	Jessica Kong	O4.2
Jason Bothwell	P8	Michael Kozak	O5.3
Derek Carlson	O2.1	Scott W. Krabbe	P27
Caitlin Carr	O7.2	Ramya Kumaran	O7.3
Anne Marie Casa	ES	Phillip Lazzara	P11, P28
Brittany Childs	P10	Keith A. Lehuta	P29
Michael Chiodo	P11, P28	Stephen Little	P30
Maia Czwornog	O2.2	Aislinn Lowry	O7.1
Kristina Dakis	P12	Harirajan Mani	P31
Hannah Detig	P13	Gina Manson	ES
Cassie DeVore	P14	Thomas Marlow	P33
Andrew Dorkin	O5.1	Anne Marquette	P32
Samantha Eads	O3.2	Julia Martino	P1, P34
Christy Engel	ES	Megan Mealer	P35
William Erlain	O3.1	Mari Mermelstein	ES
Geoffrey Evans-Grimm	P15	John Meuser	O2.3
Golibe Eze-Echesi	P16	Kari Monegato	ES
Kelsey Farrell	P17	Aaron Moore	P33
Lauren Geary	P18	Kenny Moore	P36
Cathy Gembara	ES	Jessica Pang	ES
Megan Gleason	P19	Kelly Petersen	O1.1
Clare Goebel	O1.3	Ross Pingolt	P37
Anna Groves	P20	Daniel M. Podgorski	P38
Emily Haager	ES	Kyle Portnoy	O8.2
Casey Hamm	P21	Nikki Preston	P39
Kelsey Hample	O6.1	Ryan Quinn	P40
Kathleen Henegan	P22	Garrett Rapp	O9.2
Jeremy Henle	P23	Alyssa Ray	P41
Ellen Ho	ES	BethAnne Roberts	P42

*continued.....*

**STUDENT PARTICIPANTS**

**Oral and Poster Presentations**

Peter Rosen	P43
Stephanie R. Ross	O1.2
John Sacranie	O8.3
Juliana Sainati	ES
Christina Salazar	P44
Jennifer Sanderson	P45
Jesse Schaar	O2.4, Music
Brian Schaeffer	ES
Monica Simonin	P46
Elizabeth Sinclair	ES
Cory Sloan	O3.3
Amanda Sobottka	P47
Jennifer A. Sobyra	P48
Amber Spiewak	P49
Brooke Stevens	P51
Stefan Stoev	O4.3
Erin Strauts	P50
Marie Sutor	P52
Christine Szukalla	ES
Morgan Tarbutton	P53
Bobby Tazioli	P54
Katlyn Teachen	Music
Andrew Tobin	ES
Patrick Topf	O6.2
Patricia Troxell	P55
Christopher Unger	O9.3
Katie Utesch	ES
Amy VanDerVoorn	ES
Emily Vock	O9.1
Chelsea Wallis	ES
Nate Wheatley	P56
Travis Williams	P57
Carrie Williams	ES
Malory Wodka	P58
Erica Woodall	P59
Dennis Zic	O8.1
Bobby Zoeller	ES
Jennifer Zyks	ES



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

**Saturday, April 10, 2010, 2:30 p.m., Merwin and Wakeley Galleries**

**Student Presenters:**

Katherine Bergethon

Emily Cellini

Laura Czys

Katelynn DeWitt

Alexandra Ferguson

Benn Marion

Emily Giacomino

*Refreshments will be served*

## **MUSIC COMPOSITION STUDENT PRESENTATIONS**

**Saturday, April 10**

**11 a.m.**

**Center for Natural Sciences C101**

**Selections from *The Dreamkeeper's Song***

**Katlyn Teachen '10**

**Program to be announced**

**12:15 p.m.**

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

**Free Improvisation**

**Jesse Schaar '11**

**Jesse Schaar, piano**

Music Presentation

**THE DREAMKEEPER'S SONG**

Katlyn Teachen and David Vayo\*  
School of Music, Illinois Wesleyan University

Over the past four years I have been working on writing a rock opera, with completely original libretto and music. It is called *The Dreamkeeper's Song* and is scored for voices, piano, two guitars, bass guitar, drum set, violins, violas, cellos, and flutes. I will be presenting one song from the rock opera, called "Captive to Despair". In the show it is played by two guitars, bass guitar, drum set, and a tenor, but here I will be presenting the piano vocal version. This part of the story, the main character, Johnny, is expressing his feelings of still missing his wife a lot after she died three years ago. It is the fifth song in the show

Music Presentation

**FREE IMPROVISATION**

Jesse Schaar and David Vayo\*  
School of Music, Illinois Wesleyan University

In the spring semester of 2008, I took a class with Dr. Vayo titled 'Music Improvisation Workshop.' This class had a profound effect on me as a musician, and this semester I continued my study of improvisation with Dr. Vayo doing an independent study of solo piano improvisation. My playing techniques and style are not ordinary for piano. A lot of my work involves playing the piano from the inside, contacting the strings directly. I have also done a lot of research on the effects different objects can have on the inside of the piano, such as guitar slides, guitar picks, percussion mallets, and many other things. In this performance I will perform an improvisation incorporating the new techniques I have discovered this semester.

**ORAL PRESENTATIONS - SESSION 1**  
**10:00 – 11:00**  
**CENTER FOR NATURAL SCIENCES (E101)**  
**MODERATOR: Isabella Rossi**

- 1.1 Susan Blunck, Emily Jones & Kelly Petersen  
Biology
- 1.2 Stephanie Ross  
Biology
- 1.3 Clare Goebel  
Nursing

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

- 2.1 Derek Carlson  
Computer Science
- 2.2 Maia Czwornog  
Computer Science
- 2.3 John Meuser  
Mathematics
- 2.4 Jesse Schaar  
Physics

**ORAL PRESENTATIONS - SESSION 3**  
**10:00 – 11:00**  
**CENTER FOR NATURAL SCIENCES (E103)**  
**MODERATOR: Patrick Topf**

- 3.1 William Erlain  
Economics
- 3.2 Samantha Eads  
Economics
- 3.3 Cory Sloan  
Economics

**ORAL PRESENTATIONS - SESSION 4**  
**10:00 – 11:00**  
**CENTER FOR NATURAL SCIENCES (E104)**  
**MODERATOR: Dennis Zic**

- 4.1        Mujtaba Ali Isani  
             Economics
- 4.2        Jessica Kong  
             Economics
- 4.3        Stefan Stoev  
             Economics

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

- 5.1        Andrew Dorkin  
             English
- 5.2        Catherine Hunter  
             History
- 5.3        Michael Kozak  
             History
- 5.4        Rosa Kleinman  
             Music

**ORAL PRESENTATIONS - SESSION 6**  
**11:00 – 12:00 noon**  
**CENTER FOR NATURAL SCIENCES (E106)**  
**MODERATOR: Samantha Eads**

- 6.1        Kelsey Hample  
             Economics
- 6.2        Patrick Topf  
             Economics
- 6.3        Mujtaba Ali Isani  
             Political Science

**ORAL PRESENTATIONS - SESSION 7**  
**11:00 – 12:00 noon**  
**CENTER FOR NATURAL SCIENCES (E102)**  
**MODERATOR: Rosa Kleinman**

- 7.1        Aislinn Lowry  
              Greek & Roman Studies
- 7.2        Caitlin Carr  
              History
- 7.3        Ramya Kumaran  
              History

**ORAL PRESENTATIONS - SESSION 8**  
**11:00 – 12:00 noon**  
**CENTER FOR NATURAL SCIENCES (E103)**  
**MODERATOR: Jessica Kong**

- 8.1        Dennis Zic  
              Economics
- 8.2        Kyle Portney  
              Economics
- 8.3        John Sacranie  
              Economics

**ORAL PRESENTATIONS - SESSION 9**  
**11:00 – 12:00 noon**  
**CENTER FOR NATURAL SCIENCES (E104)**  
**MODERATOR: Stephanie Ross**

- 9.1        Emily Vock  
              History
- 9.2        Garrett Rapp  
              Religion
- 9.3        Christopher Unger  
              International Studies

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

Oral Presentation O1.1

**CADMIUM, COPPER, IRON, AND ZINC CONCENTRATIONS IN THE  
KIDNEYS OF GREY WOLVES (*CANIS LUPUS*) FROM ALASKA, IDAHO,  
MONTANA, AND THE NORTHWEST TERRITORIES**

Susan Blunck, Emily Jones and Kelly Petersen and Given Harper\* and Jeffrey Frick\*  
Biology and Chemistry Departments, Illinois Wesleyan University

The purpose of this study was to document levels of cadmium (Cd), copper (Cu), iron (Fe), and zinc (Zn) in lethally controlled and legally harvested grey wolves (*Canis lupus*) from Idaho, Montana and Alaska in the United States, and from the Northwest Territories, Canada. As top predators, grey wolves may accumulate elevated levels of heavy metals, which are known to biomagnify. However, few studies of heavy metals in wolves have been conducted. Concentrations of heavy metals in wolf kidneys were determined using Inductively Coupled Plasma Emission Spectrometry. Wolves from Alaska had significantly higher levels of Cd and Zn than wolves from all other locations. In Alaska, Fe concentrations were significantly higher in females than in males, while in Montana, Cu concentrations were significantly higher in adults than in subadults. Future studies should determine if heavy metal biomagnification has occurred via analysis of wolf food chains, and the potential impacts of these metals on wolves.



Oral Presentation O1.2

**THE UPTAKE OF DISSOLVED MOLECULES BY THE  
FRESHWATER ROTIFER, *ASPLANCHNA PRIODONTA***

Stephanie R. Ross and William Jaeckle\*  
Biology Department, Illinois Wesleyan University

DOM (dissolved organic matter) is an abundant potential source of nutrition for aquatic invertebrates, however, its nutritional significance is not well documented. Rotifers are water aquatic metazoans which utilize a ciliated corona for food acquisition. The carnivorous freshwater rotifer, *Asplanchna priodonta*, was exposed to labeled proteins and polysaccharides at substrate concentrations of  $\leq 1\text{mg/mL}$  for 1-18 hours. Initially, the labels were observed within the stomach lumen and gastric epithelium. With extended exposure, the intensity of the label increased and was detected within the body cavity. These results suggest that the gastric cavity is continually exposed to freshwater and DOM present may be absorbed. This is consistent with previous studies describing digestion as initially extracellular and subsequently intracellular within endocytotic vesicles. The presence of labeled compounds within stomach cells and the body cavity of *A. priodonta* demonstrates this species's ability to digest and assimilate DOM as a possible source of nutrition.

Oral Presentation O1.3

**RELIABILITY MEASUREMENT OF THE PREMATURE INFANT  
ORAL MOTOR INTERVENTION (PIOMI)**

Clare Goebel and Brenda Lessen\*  
School of Nursing, Illinois Wesleyan University

Premature Infant Oral Motor Intervention (PIOMI), a 5-minute oral motor intervention on 29-30 weeks post-menstrual age infants, has been developed to improve bottle-feeding and decreased length of stay (Lessen, 2009). The objective of this research was to determine the reliability of the PIOMI. The research question addressed was if the PIOMI demonstrates interobserver, interuser, and test-retest reliability. The research was conducted in a Level 3 Neonatal Intensive Care Unit at a large Midwestern teaching medical center.

A reliability tool was developed for this study based on a 4 point Likert scale according to 3 criterion: correct order, correct time, and correct technique. A training video on the PIOMI was also created. Two raters observed three nurses performing the PIOMI on preterm infants. The reliability among the raters (interobserver), the reliability among different nurses (interuser), and the reliability of the same nurse performing the PIOMI twice (test-retest) was calculated.

Oral Presentation O2.1

## **OPTIMIZATION AND ANALYSIS OF A ROBOTIC NAVIGATIONAL ALGORITHM**

Derek Carlson and Joshua Brown Kramer\*  
Computer Science Department, Illinois Wesleyan University

The problem of robot navigation involves planning a path to move a robot from a start point to a known target point within an obstacle course. The efficiency of such an algorithm can be measured in several ways. For instance, Lumelsky and Stepanov measure the length of the path taken in terms of obstacle perimeters. Gabriely and Rimon compare their two-dimensional algorithm's efficiency to that of the optimal algorithm. Brown Kramer and Sabalka expand upon the work of Gabriely and Rimon to produce an algorithm for dimensions greater than two. The primary objective of this research was to implement improvements in Brown Kramer and Sabalka's algorithm called Boxes, which performs a depth-first search of a discretized obstacle space. Enhancements such as subdivision of the obstacle space and the maximal coloring improvement improve the efficiency of the algorithm significantly.

Oral Presentation O2.2

**AN IMPLEMENTATION OF A PATH PLANNING ALGORITHM FOR A ROBOT**

Maia Czwornog and Joshua Brown Kramer\*  
Computer Science Department, Illinois Wesleyan University

Robot path planning is a multi-discipline field that is interested in finding consistent solutions to travel from some starting point to a goal location. There are many varying applications that include mundane things like the Roomba and unusual things such as the Mars exploration robots. Path planning tasks, while easily accomplished by humans, are difficult for robots. This presentation will examine several basic approaches to path planning, the evolution of two-dimensional sensorless navigation problems, and some difficulties that occur when applying path planning algorithms to a physical medium. It will also include a demonstration on a robot of an algorithm created by IWU faculty member Josh Brown Kramer and his coauthor Lucas Sabalka.

Oral Presentation O2.3

## M-REFINABLE EXTENSIONS OF REAL VALUED FUNCTIONS

John Meuser and Tian-Xiao He\*

Math and Computer Science Department, Illinois Wesleyan University

A function is  $m$ -refinable if it can be written as a linear combination of its  $m$ -dilates and integer translates. The coefficients of this linear combination form a sequence called the *refinement sequence*. Let  $f : [0, N) \rightarrow \mathbb{R}$  and pick a sequence of real numbers  $\{c_i\}_{i=0}^N$  so that  $c_0, c_N \neq 0$ . Then a unique function  $\tilde{f} : \mathbb{R} \rightarrow \mathbb{R}$  can be constructed so that  $\tilde{f}|_{[0, N)} = f$  and  $\tilde{f}$  is refinable with refinement sequence  $\{c_i\}_{i=0}^N$ . The construction of  $\tilde{f}$  suggests a method for characterizing all compactly supported  $m$ -refinable functions.

Oral Presentation O2.4

## **IMPROVING DATA FILTERING WITH AZTEC GROUP**

Jesse Schaar and Thushara Perera\*  
Physics Department, Illinois Wesleyan University

As we look into the sky, we are looking into the past because light travels at finite speed. Because of this principle, we are able to look at galaxies in the early universe, which can tell us a lot about how the universe has evolved to be what it is today. The earliest structures in the universe, young galaxies, are brightest at longer wavelengths than today's galaxies. We are working with data from the AzTEC (Astronomical Thermal Emissions Camera) instrument which observes the sky at millimeter wavelengths using a telescope in the high Andes of Chile. The data processing is very important to determine what information is due to real signals in the sky and what is due to noise. We are currently working on a "data filtering" method to produce the best results and minimize the effects of noise. We will describe the fake sky simulations used to test various filters and will present our results.

Oral Presentation O3.1

**TIME SERIES ANALYSIS: LEASES**

William Erlain and Diego Mendez-Carbajo\*  
Economics Department, Illinois Wesleyan University

This project studies the frequency of time-based agreements for property control, better known as leases, filed in McLean County, IL from January 1990 through December 2009 on a monthly basis. We choose McLean County for its relevance to Illinois Wesleyan University and for its mixture of urban and rural areas. By analyzing trends (long term patterns) in the data, we detect no correlation between lease frequency and business cycles; however, leases are inversely related to the housing market's health. Furthermore, we fit an ARMA model to the data to try and forecast future frequencies of leases in the county. To be autoregressive (AR), the data depends on a previous value, and to have a moving average (MA), the data depends on a white noise process in its errors. Forecasting future frequencies of leases is beneficial for policy making within the county.

Oral Presentation O3.2

**THE FREQUENCY OF SUBORDINATION AGREEMENTS PER MONTH IN  
MCLEAN COUNTY (1998-2009)**

Samantha Eads and Diego Mendez-Carbajo\*  
Economics Department, Illinois Wesleyan University

This paper studies the impact of business cycles on the frequency of subordination agreements per month in McLean County, Illinois from January 1998 to December 2009. This study examines trends, seasonal components, and autoregressive and moving-average components of the data to forecast this impact in the future. Both autoregressive and moving-average components indicate the influence of previous values on the current value of the data. A subordination agreement is a legal document that establishes the place of priority of mortgages, liens, and claims on the same parcel of land. It is estimated that the frequency of subordination agreements per month is countercyclical, meaning it will increase during a recession and decrease during an expansion. The data shows that during the recession of the early 2000s there was a dramatic increase in the number of subordination agreements per month, but after the housing market collapsed there was only a slight increase in this frequency.



Oral Presentation O3.3

**VARIABILITY IN MORTGAGE FREQUENCY:  
MCLEAN COUNTY SINCE 2000**

Cory Sloan and Diego Mendez-Carbajo\*  
Economics Department, Illinois Wesleyan University

This paper studies the trends and cyclical components of the mortgage market in an attempt to forecast future values. We are dealing with only the frequency of mortgages per month rather than the values of the mortgages in dollars. The collected data is mortgages filed within the Mclean county borders, spanning 120 months from January 2000 through December 2009. Mclean County is the best county to study because of its relevance to the expected audience and local economy. The time of the dataset is ideal because it contains both expansions and recessions and can effectively show a cyclical trend, if one exists. Using any seasonal, cyclical or trend components we are able to forecast what amount of mortgages will likely be filed in the future. This data can then be used and implemented as a rough estimator as to find certain months or years where the frequency of mortgages is higher and filing for a mortgage can be more successful.

Oral Presentation O4.1

**LABOR MARKET OUTCOMES OF MIDDLE EASTERN IMMIGRANTS IN THE  
AFTERMATH OF SEPTEMBER 11<sup>TH</sup>**

Mujtaba Isani and Michael Seeborg\*  
Economics Department, Illinois Wesleyan University

Media reports all over the USA reported that a wave of Islamophobia had gripped the USA after the September 11, 2001 attacks. It seemed as though the American population were blaming not the radicals but the Middle Easterners and the Muslims in general for the inhumane act. Some reports even suggested a new sort of McCarthyism in the USA but this time against the Middle Eastern populace. My paper will investigate whether such discrimination transformed itself in the US labor market by conducting an econometric analysis, taking Becker's taste for discrimination theory as its theoretical basis. My paper will first analyze whether there was a significant change in wage differentials between Middle Eastern population groups compared to native Americans pre and post 2001. Secondly, my paper will accomplish a regional analysis to see whether the populations from certain Middle Eastern regions were discriminated more than other regions due to the perception of being closely related to the attacks of September 11<sup>th</sup>. Lastly, my paper will look at other labor market determinants such as labor force participation rates and unemployment rates, to make out whether discrimination was present in other avenues and to provide an all encompassing picture of Middle Eastern immigrants in the US labor market.

Oral Presentation O4.2

**THE EFFECTS OF MARITAL STATUS & GENDER ON  
HEALTH CARE INSURANCE COVERAGE IN THE UNITED STATES**

Jessica Kong and Michael Seeborg\*  
Economics Department, Illinois Wesleyan University

Having health insurance is a crucial factor for many to sustain life in America. This study examines the demographic determinants of health care coverage within the United States with a focus on how gender and marital status influence the likelihood of having health insurance. Using the human capital theory and the theory of statistical discrimination, it is predicted that married females will have a higher probability of being insured than divorced and separated females. Also, divorced males are predicted to have a higher probability of coverage than divorced females. The data for this research is retrieved from the United States Census Bureau for the Bureau of Labor Statistics using the Current Population Survey (CPS) for the year 2009, with a sample size of nearly 100,000 respondents. An OLS and probit regression are used to conduct this study, as well as descriptive statistics. The study also uses simulations to find the probability of having insurance for various demographic groups in relation to gender and marital status.

Oral Presentation O4.3

**THE EFFECTS OF US MONETARY POLICY ON THE YIELD CURVE**

Stefan Stoev and Amit Ghosh\*

Economics Department, Illinois Wesleyan University

The central bank of the U.S., the Federal Reserve, oversees the financial system in the country and is in charge of maintaining monetary and financial stability. Its main purpose is to dampen economic business cycle fluctuations and ensure optimal functioning of different financial institutions. The policy tool it uses in this process is termed monetary policy. This is conducted by the Fed through purchase and sale of U.S. Treasury securities with the public – a procedure referred to as open market operations. U.S. Treasury securities are classified in three categories, bills, notes and bonds, with maturity periods varying from less than a year to thirty years. A yield curve shows the plot of interest rates of these securities with their corresponding time to maturity. The yield curve of treasuries is important because it holds forecasting powers about expected inflation rates, interest rates and economic growth. Using quarterly data spanning over the last four decades, this study examines the impact of monetary policy on the slope of the yield curve. Fed policy making is captured by using different measures – size of the Fed's balance sheet, money supply growth rate.

Oral Presentation O5.1

**ONLY DULL READERS ESCAPE: NAVIGATING CONTEXTUAL FRAMES IN  
STEPHEN CRANE'S *THE BLACK RIDERS***

Andrew Dorkin and Michael Theune\*  
English Department, Illinois Wesleyan University

*The Black Riders and other lines*, Stephen Crane's first book of poems, has suffered from marginalization and underestimation at the hands of critics whose interests in Crane's fiction and in Crane himself have overshadowed any attempts at understanding the poems as the text they comprise. In this essay, I attempt to redress this pattern with an approach that accounts for our experience of *The Black Riders* as readers: first, by recognizing the humor in these poems that previous scholars have overlooked; and then by exploring the way the text—when treated as a structurally coherent, unified work—pulls our laughter into the contextual frames of our interpretations. Ultimately, this project seeks to reorient scholarship towards understanding the text's affective purpose, beyond and before its ubiquitously assumed philosophical or autobiographical meanings.

Oral Presentation O5.2

**THE REVOLVING DOOR: AN EXAMINATION OF SINO-U.S. TRADE TREATIES  
AFTER THE IMPLEMENTATION OF THE U.S. OPEN DOOR POLICY**

Catherine Hunter and Thomas Lutze\*  
History Department, Illinois Wesleyan University

Beginning in 1900 with the implementation of the United States Open Door policy, economic relations with China and the United States grew dramatically. This policy was originally intended to sustain territorial and political rights within China; however, after its implementation the Open Door policy became the justification for all foreign interests within China. This presentation will examine how the Open Door Policy became so concrete in the foreign policies of the United States and China until Chinese independence in 1949.

Oral Presentation O5.3

**U.S. MILITARY AID AND REVOLUTIONARY NATIONALISM IN CHINA**

Michael Kozak and Thomas Lutze\*  
History Department, Illinois Wesleyan University

For the United States China has always been a land of dreams, potential markets and resources. Although the United States funded the Chinese Nationalists throughout the Chinese civil war to keep the potential for the elusive China market alive, the squandered military aid led to the Nationalists defeat. This presentation will examine the relationship between the military aid by the United States to China and the revolutionary nationalism that defined the period of conflict in China after World War Two, with specific focus on the China White Paper. The situation in China was complicated due to the irreconcilable differences in U.S. policy toward the Nationalist government. The U.S. could not withdraw support for Chiang Kai-shek, but could not force Chiang Kai-shek to make reforms to make military aid effective. Military aid to China kept the U.S. tied to the status of the Nationalist, as well as, to our own emerging Cold War policy.

Poster Presentation O5.4

**CLASH OF EXPECTATIONS: THE RECEPTIONS OF SHOSTAKOVICH'S  
SEVENTH AND EIGHTH SYMPHONIES IN THE US AND THE SOVIET UNION**

Rosa Kleinman and Stephen Press\*  
School of Music, Illinois Wesleyan University

This paper is a study of the critical reception of Shostakovich's Seventh and Eighth Symphonies. Both were written at the height of World War II. Shostakovich's Seventh was a Symphony that ideologically defeated Hitler's fascism. It was highly acclaimed in the Soviet Union and by American audiences, but attacked by some American critics for both its program and mediocre quality. Still, it was enormously successful and it prompted an equally monumental sequel, the Eighth Symphony. Soon after the premiere, the Eighth dismissed as tragic, formalistic, and individualistic by the Soviet cultural apparatus, but that did not quell America's interest. Americans greeted it with the same curiosity as before and critics acknowledged a marked improvement. What spawned different reactions from different camps? The successes and failures of the Symphonies must be examined in relation to historical context and cultural expectations.



Oral Presentation O6.1

**THE EFFECTS OF PARENTAL EDUCATION ON THE EARNINGS OF CHILDREN IN  
NATIVE AND IMMIGRANT FAMILIES**

Kelsey Hample and Michael Seeborg\*  
Economics Department, Illinois Wesleyan University

While immigrants in the United States tend to earn less than comparable natives, their children tend to earn more. The purpose of this study is to determine how differences in intergenerational transfer of human capital between immigrant families and native families affect different earning outcomes for respondents of each group. Specifically, this study analyzes how parents' education influences their children's earnings. Of particular interest is how parents' education indirectly affects their children's earnings by first influencing their educational attainment. Data from the 1979 National Longitudinal Survey of Youth allows background variables within a family from 1979 to be related to respondent earnings in 2006. The analysis shows that while parental education is a strong predictor of respondent education and earnings in the native population, it is weaker for second generation immigrants' earnings. However, the results support that immigrant parents have a relatively larger influence on their children's educational attainment, thereby indirectly influencing their earnings.

Oral Presentation O6.2

**EXAMINING SUCCESS OF MOTION PICTURES AT THE DOMESTIC BOX-OFFICE**

Patrick Topf and Ilaria Ossella-Durbal\*  
Economics Department, Illinois Wesleyan University

The movie business is a multi-billion dollar industry involving production crews, marketing crews, actors, directors, distribution companies, movie theaters, and movie rental companies, but while each movie created follows the same routine, why do some perform so much better than others at the box-office? Why did Juno become a smash hit while Poseidon is regarded as a major box-office bomb? This study looks into which factors result in movie success and which are not important at all.

Oral Presentation O6.3

**THE RISE AND FALL OF MAUDUDI'S JAMAAT-E-ISLAMI IN THE LIGHT OF  
SOCIAL MOVEMENT THEORY**

Mujtaba Isani and James Simeone\*

Political Science Department, Illinois Wesleyan University

The Jamaat-e-Islami, the social movement that was suppose to be embodiment of the great Maulana Abu A'la Maududi's "masterframe", was never able to live up to its expectations nor was able to achieve its main goal of creating an Islamic state. An ideology that inspired movements around the world, affecting even the mighty Hassen al-Banna and Sayyid Qutb; a party that had branches in India, Bangladesh, Srilanka, Azad and Jammu Kashmir; was never able to win more than ten seats in the National Assembly of Pakistan. In my paper I will analyze the rise and fall of the Jamaat through using tools provided by social movement theory.

Oral Presentation O7.1

**SEXUAL HEALING: GENDER, SEXUALITY, AND THE BALANCE OF THE  
MASCULINE AND FEMININE CREATIVE PRINCIPLES IN THE  
HEALING CULT OF ASCLEPIUS**

Aislinn Lowry and Nancy Sultan\*

Greek and Roman Studies Department, Illinois Wesleyan University

The healing cult of Asclepius at Epidauros flourished in the 4th Century BCE as droves of men and women made the pilgrimage to slumber in his temple, hoping to receive healing from the god in a dream. This study analyzes gender roles and sexuality within the cult of Asclepius through the analysis of inscriptions, medical texts, poetry, mythology, and art. I will argue that the ancient Greek understanding of gender identity and sexuality was so omnipresent that it permeated everything from the concepts of illness and health themselves, to the appearance of the deities, and even the way healing was administered and received within the sacred precinct. Also, I contend that Hygeia and Asclepius, representing health through harmony with nature and medical intervention respectively, were created and function in healing cults as an interdependent, inextricably linked sexual binary: health, equated with femininity and nature, and medicine, culturally constructed and masculine. Ultimately, I conclude that the balance and adequate influence of both the masculine and the feminine creative principles, embodied by the divinities of healing and represented by all actors and objects associated with them, must be present for healing to occur.

Oral Presentation O7.2

**LAKE FOREST: A COMMUNITY'S SEARCH FOR PERFECTION  
IN THE PROGRESSIVE ERA**

Caitlin Carr and Robert Schultz\*  
History Department, Illinois Wesleyan University

Lake Forest, Illinois in the Progressive Era was a highly exclusive safe haven for the elite of Chicago. But Lake Forest was more than a high priced suburb for successful businessmen and the children of entrepreneurs; it was a community where wealthy individuals would attempt to create the perfect environment. The residents of Lake Forest wanted a place apart not only from undesirables but also from the issues that plagued the city of Chicago, such as poor sanitation, crime, and other social ills. This presentation will explore how the residents attempted to create a perfect community, from the architecture they chose for their estates to the social world they created. In addition, this presentation will also examine the connections between Lake Foresters' desire to create a utopian environment and the progressives' need for control in a chaotic world, along with the unfaltering progressive belief in the perfectibility of society.

Oral Presentation O7.3

**COMFORT WOMEN: A COMPARATIVE STUDY OF SOCIETAL ORIGINS**

Ramya Kumaran and Thomas Lutze\*  
History Department, Illinois Wesleyan University

During Japanese occupation in World War II, the Japanese recruited sex slaves, often referred to as “comfort women,” to satisfy the sexual appetite of their army. This presentation will be a comparative study which examines the societal origins of these comfort women and how the Japanese filled comfort women in accordance to army rank. Research has shown that the women were from a variety of backgrounds and countries. The findings show that the Japanese were more calculated than spontaneous in their overall recruitment of the comfort women, and although there are many different countries represented in this study, this is a prevalent overarching occurrence.

Oral Presentation O8.1

## **ANALYSIS OF MORTGAGE VALUES**

Dennis Zic and Diego Mendez-Carbajo\*  
Economics Department, Illinois Wesleyan University

This study attempts to analyze the impact of the Federal Housing Tax Credit of 2009 on home purchasing patterns. With an estimated 18% of U.S. GDP tied to the recovery of the housing market, an effective policy to stimulate the housing market could potentially portend the overall recovery of the overall U.S. economy. To determine the impact of the tax credit, it is necessary to first identify the seasonal component of the data. To isolate the tax credit's degree of impact, I will subtract the average seasonal component from 1999 to 2008 from seasonal component for the year 2009. Based on the statistical significance of this difference, a hypothesis can begin to be formulated about the effectiveness of the tax credit. The mortgage values for this sample come from McLean County, Illinois on a monthly basis, from January 1999 through December 2009. With an urban to rural ratio and homeownership rate similar to the national average, McLean County provides a representative sample of the American housing market.

Oral Presentation O8.2

**STATE TAX LIENS AND THE BUSINESS CYCLE  
IN MCLEAN COUNTY (1999-2009)**

Kyle Portnoy and Diego Mendez-Carbajo\*  
Economics Department, Illinois Wesleyan University

The amount of state tax liens issued in a county may indicate the economic health of the community. A lien, or security interest, on a property is issued when taxes are not paid on time. This paper studies the economic health of McLean County, Illinois, the largest county in terms of area in Illinois. The data are reported on a monthly basis from 1999 to 2009. Due to the fact that state tax liens are issued by the state, there is no benefit to McLean County whether there are large or small amounts of liens issued. What can be said by the amount of liens issued, though, is the status of its economic health. The main hope of this study is to determine whether or not there is a trend, or pattern over a long period of time, in the data and to forecast the future of McLean County's economic health.



Poster Presentation O8.3

**CONSUMER PERCEPTIONS & VIDEO GAME SALES: A MEETING OF THE MINDS**

John Sacranie and Robert Leekley\*  
Economics Department, Illinois Wesleyan University

This paper examines the determinants of video game software sales. What little literature currently exists points to an array of factors, ranging from which hardware a title is released on to the game's genre. This paper incorporates several of these variables, but adds in a new one: quality. Literature up to this point has not addressed the effect that a game's quality has on its eventual sales, yet one would logically expect this to have a strong positive impact. To account for quality, the model incorporates the average review score a game receives from professional critics. The results indicate that indeed, quality does play a role in consumers' purchase decisions.

Oral Presentation O9.1

**MARRIAGE REFORMS IN COMMUNIST CHINA: A SUCCESSFUL  
BREAK WITH TRADITION?**

Emily Vock and Thomas Lutze\*

History Department, Illinois Wesleyan University

After 2500 years of Confucian tradition guiding social and familial relations in early twentieth century China, attempts to alter gender roles and marriage customs by the Communist Party from the 1920s through the 1970s, met with mixed results and difficulty. Women's equality represented a key element of the Communist ideology, and the party often successfully initiated radical, wide-scale laws and campaigns to promote gender equality. However, personal accounts indicate that within individual homes, equality did not always prevail. In this project, I am investigating how gender equality was promoted through marriage reforms both in the public realm of society and the domestic sphere of private households. Comparing the private and domestic element of marriage to the public and political institution, for the periods of the United Front, the civil war, New Democracy, the Great Leap Forward, the Cultural Revolution, and the post-Mao period, this research suggests that the tradition of 2500 years was so entrenched that the party's sweeping reforms and propaganda could not make true equality within the private home possible, even as women's role in public life and equality grew.

Oral Presentation O9.2

**SEARCHING FOR TRUTH IN THE SECULAR AGE: UNITARIAN UNIVERSALISM,  
ECLECTICISM, AND SECULAR SPIRITUALITY IN MODERNITY**

Garrett Rapp and Robert Erlewine\*  
Religion Department, Illinois Wesleyan University

Unitarian Universalism (UUism), the product of unification between the two sects in the 1960s, owes much to its 19th century provenance among various sects of liberal Protestantism. Additionally, its development paralleled the accelerating phenomenon of secularism in the modern West, which framed the environment in which it distilled its values. In my paper I describe Unitarianism's differences and similarities with 19th century Protestantism, the common threads of secularism carried through Unitarianism and Universalism's developments, and modern UUism's approach to questions of faith and religious truth. I also address the mode of eclecticism that UUism employs in its interactions with other religious traditions, and discuss some of the dangers inherent in this process. Finally, I address the question of whether and to what extent Unitarian Universalism embodies a quintessentially secular liberal faith.

Oral Presentation O9.3

## **CHILDREN'S RIGHTS UNDER INTERNATIONAL LAW**

Christopher Unger and James Matthews\*

International Studies Department, Illinois Wesleyan University

This paper proposes to analyze national law as it interacts with international law. It will examine how national law and national courts apply international treaties, conventions, and international court rulings, in national matters. More specifically, this paper will analyze international law in terms of children's rights, with specific reference made to the United Nations Convention on the Rights of the Child. This paper will analyze the merits of this document and look into the way that the United States, Canada, and Argentina apply these rights.

The United States, while it was fundamental in the formation of the United Nations and the writing of this convention, it remains one of the few developed nations not to sign the convention. This paper will examine the United States' position on the convention and what events have lead up to the US not signing the convention and then analyze the likelihood of the United States eventually ratifying the convention. The paper will then examine children's rights in the United States and how they could be improved by ratification. The paper will then compare the United States to Canada and Argentina, two nations that have ratified the convention and had radically different views on children's rights and one that is still considered a developing nation.

Ultimately, I believe that this paper would conclude that it is in the best interests of the child for the children to be extended more rights than they are given now under the state system. The children's rights, or current lack thereof, in the United States is harming the psychological development of the child. The paper will have to propose suggestions on how to implement children's rights and inform the child of their rights.

**POSTER SESSION A**

**9:00 - 10:00 a.m.**

Odd-Numbered Posters

**POSTER SESSION B**

**2:35 – 3:35 p.m.**

Even-Numbered Posters

**EDUCATIONAL STUDIES POSTERS - ES**

**9:00 – 10:00 a.m.**

Lower Level – Ames Library

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

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

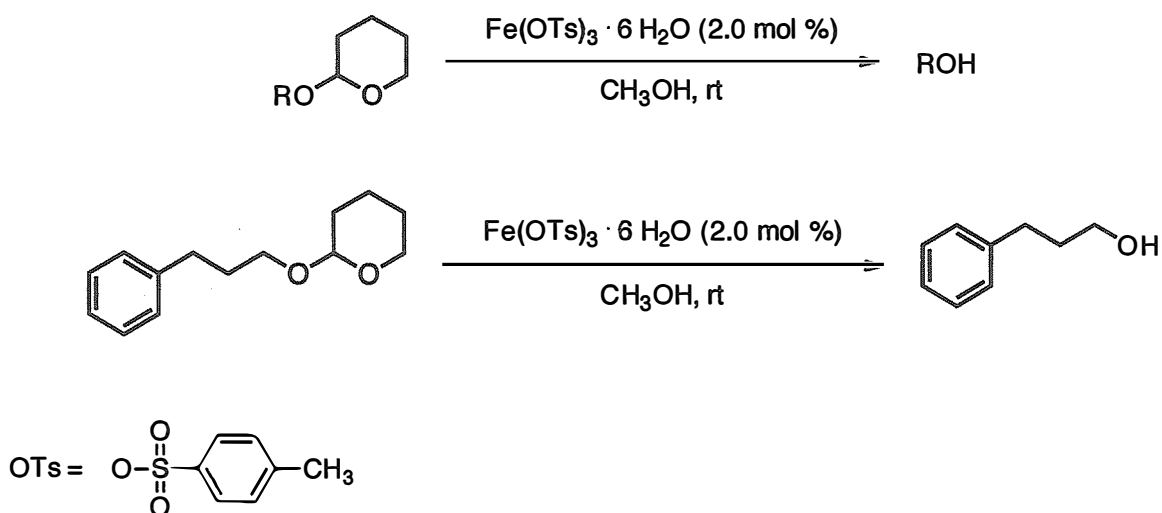
Please remove your posters from CNS Atrium by 4:00 p.m.

Poster Presentation P1, P34

**IRON (III) TOSYLATE CATALYZED DEPROTECTION OF  
TETRAHYDROPYRANYL ETHERS**

Veronica V. Angeles, Julia M. Martino and Ram S. Mohan\*  
Chemistry Department, Illinois Wesleyan University

Tetrahydropyranyl (THP) ethers are a common protecting group for alcohols and phenols in the course of a total synthesis due to their ease of preparation and removal, and their stability to strongly basic conditions, hydrides, and alkylation reagents. A common method for the deprotection of THP ethers involves acidic hydrolysis using *p*-toluenesulfonic acid in methanol or pyridinium *p*-toluenesulfonate in ethanol. Both these reagents are corrosive and difficult to handle. Other methods include the use of toxic or expensive catalysts such as tris(4-bromophenyl)aminium hexachloroantimonate (TBPA<sup>+</sup>SbCl<sub>6</sub><sup>-</sup>) in methanol and PdCl<sub>2</sub>(CH<sub>3</sub>CN)<sub>2</sub> in wet CH<sub>3</sub>CN under reflux conditions. We have developed a catalytic method for the deprotection of THP ethers in methanol using iron(III) tosylate as a catalyst. Iron(III) tosylate is an attractive catalyst because of its relatively low cost, low toxicity, and ease of handling. The results of this study will be presented.



Poster Presentation P2

**EXPRESSION OF PORPHOBILINOGEN SYNTHASE IN SYNECHOCYSTIS 6803**

Linda Agyapong and David Bollivar\*  
Biology Department, Illinois Wesleyan University

All natural tetrapyrroles such as Vitamin B<sub>12</sub>, Heme, and Chlorophyll share a common biosynthetic pathway. They all utilize the compound porphobilinogen as a common precursor to their synthesis. The synthesis of porphobilinogen is catalyzed by the enzyme, porphobilinogen synthase (PBGS). Transcription of the PBGS gene results in a protein that converts the compound 5-aminolevulinic acid to porphobilinogen. The main purpose of this research is to isolate and observe the function of the PBGS gene in *Synechocystis 6803*, a photosynthetic cyanobacterium. In the species *Synechocystis 6803*, PBGS allows for the synthesis of chlorophyll and heme. Through a series of experiments, we hope to isolate the PBGS gene in the cyanobacterium and observe the enzymatic activity of the PBGS protein. We hope to transform electrocompetent *E.coli* cells with a vector containing the PBGS gene of *Synechocystis 6803* and then clone the gene into an expression vector. The expression vector will allow expression of the enzyme, thus the enzymatic activity of the gene can be observed.

Poster Presentation P3

**DEVELOPMENT OF A DISCOVERY LABORATORY TO OBSERVE AND QUANTIFY  
PROTEIN DENATURATION AND COAGULATION IN EGG WHITE ALBUMIN**

Elizabeth Ave Maria and Melinda Baur\*  
Chemistry Department, Illinois Wesleyan University

Protein denaturation and coagulation are complex processes that occur in biological systems. Protein denaturation is the process by which the tertiary structure of a protein is disrupted and the molecule becomes “unfolded,” and protein coagulation is the process by which these denatured proteins bind together in an unorganized way. The goal of this project was to develop an experimental procedure to allow students to observe and quantify the denaturation and coagulation processes in egg white albumin. Egg whites were diluted and then heated to force protein denaturation and coagulation. Differences in the extent to which the egg white protein coagulation occurred were observed and quantified over a time course at four different temperatures. The use of b-mercaptoethanol, a compound that reduces disulfide linkages essential to protein structure, was also introduced into the albumin solution to examine its effects on the amount of denatured and coagulated protein. Gravimetric analysis and SDS-polyacrylamide gel electrophoresis were used for quantitative analysis of the coagulated protein. No significant difference in coagulation was detected over the time course. Significant differences in coagulation were detected at different temperatures and when b-mercaptoethanol was added to samples.

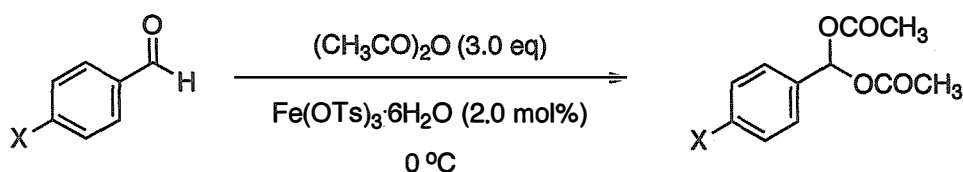


Poster Presentation P4

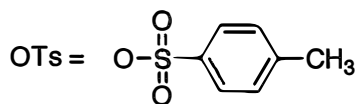
## IRON (III) TOSYLATE CATALYZED SYNTHESIS OF 1,1 DIESTERS (ACYLALS) FROM ALDEHYDES

Kyle A. Beasley, Phillip R. Lazzara, and Ram S. Mohan\*  
Chemistry Department, Illinois Wesleyan University

Acylals are useful as protecting groups for aldehydes in organic synthesis. In addition, they can be converted to other functional groups. Standard methods for protecting aldehydes as acylals utilize catalysts such as anhydrous ferrous sulfate, ceric ammonium nitrate,  $\text{Cu}(\text{OTf})_2$ ,  $\text{FeCl}_3$ ,  $\text{H}_2\text{NSO}_3\text{H}$ ,  $\text{H}_2\text{SO}_4$ ,  $\text{I}_2$ ,  $\text{InCl}_3$ ,  $\text{LiBF}_4$ ,  $\text{LiOTf}$ , NBS,  $\text{PCl}_3$ ,  $\text{Sc}(\text{OTf})_3$ , and  $\text{TMSCl-NaI}$ . Many of these reagents are highly corrosive and difficult to handle while some of the Lewis acids are expensive. We have developed an iron (III) tosylate catalyzed conversion of aldehydes to acylals in  $\text{CH}_3\text{CN}$  as a solvent. The reaction can also be carried out under solvent-free conditions. Iron (III) tosylate is an attractive catalyst because of its low cost, low toxicity, and its ease of handling. The results of this study will be presented.



X = Br, Cl,  $\text{CH}_3$ ,  $\text{OCH}_3$



Poster Presentation P5

**VARIABLE ABSORPTION OF DISSOLVED ORGANIC MATERIAL  
BY PILIDIUM LARVAE**

Kristina Bennett and William Jaeckle\*  
Biology Department, Illinois Wesleyan University

Many marine nemerteans develop through a free-swimming stage called a pilidium larva. Pilidia are known to feed on suspended single-celled algae and bacteria. Pilidia may use dissolved organic materials (DOM) in seawater as an additional source of nutrition. We investigated DOM absorption by pilidium larvae collected from two geographical regions. Larvae collected from the western Atlantic Ocean showed no detectable absorption of the protein ferritin (1 mg / mL) from seawater ( $\leq 10$  h, 25°C). In contrast, when larvae of Antarctic nemertean *Parborlasia corrugatus* were exposed to the polysaccharide iron dextran (1 mg / mL) for  $\leq 26$  h (0°C) the label was detected in the cells of the digestive system. This pattern of absorption is explained by seawater flow into the digestive system. For tropical larvae, data do not support DOM as a potential nutrient source; while for polar larvae, it seems that DOM could serve as an augmenting resource.

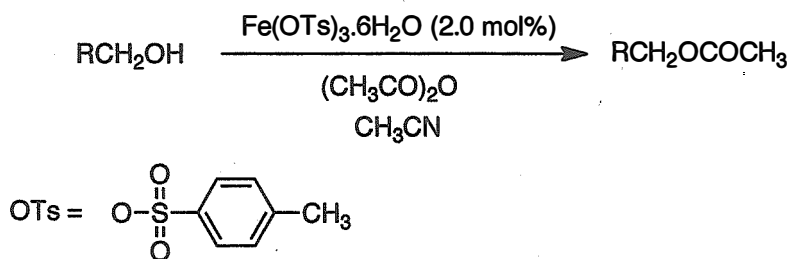
Poster Presentation P6

## IRON (III) TOSYLATE CATALYZED CONVERSION OF ALCOHOLS AND PHENOLS TO ACETATES

Matt Berg and Ram S. Mohan\*

Chemistry Department, Illinois Wesleyan University

Efficient methods for the conversion of the hydroxyl group in alcohols and phenols to the corresponding acetates are of considerable interest and use in organic synthesis. One common method for conversion of an alcohol to the corresponding acetate involves reaction with acetic anhydride in the presence of pyridine and *N, N*-Dimethylaminopyridine (DMAP). However, both pyridine and DMAP are highly toxic and difficult to handle. We have developed a simple and efficient method for conversion of alcohols to acetates using iron (III) tosylate as catalyst. Iron (III) tosylate is an attractive catalyst because of its low cost, low toxicity, and its high ease of handling. The results of this study will be presented.



Poster Presentation P7

**ELECTROCHEMICAL ETCHING TECHNIQUE FOR  
FABRICATING TUNGSTEN NANOTIPS**

Thomas Bersano and Bruno deHarak\*  
Physics Department, Illinois Wesleyan University

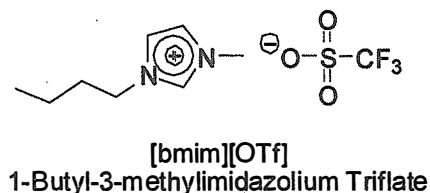
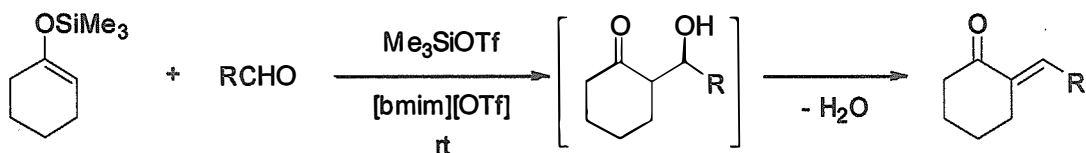
This work will describe an electrochemical etching technique for fabricating sharp metal tips. The tips have diameters between 100-500 nm. I will discuss some of the factors that affect the sharpness of the tips. Tips of this size can be used in scanning tunneling microscopy and atomic force microscopy. Typically these techniques are used to image surfaces with atomic resolution. However, we will use the tips to create short pulses of electrons to study molecular dynamics at short time scales.

Poster Presentation P8

## INVESTIGATIONS INTO THE TRIMETHYLSILYL TRIFLATE CATALYZED MUKAIYAMA ALDOL REACTION IN IONIC LIQUIDS

Jason M. Bothwell and Ram S. Mohan\*  
Chemistry Department, Illinois Wesleyan University

One drawback of the aldol condensation is that the aldol product often contains di-, poly-, or self-condensation products, which makes product isolation difficult. The Mukaiyama Aldol reaction, which is a Lewis-acid catalyzed reaction between a silyl enol ether and an aldehyde, affords the cross-aldol addition product in good yield. Room temperature ionic liquids (RTIL) have attracted much attention in the last decade due to their potential as “green solvents.” In addition, due to their unique solubility characteristics and polarity, unexpected reaction pathways often occur in ionic liquids. We have recently investigated the TMSOTf catalyzed (2.0-20.0 mol%) Mukaiyama Aldol Reaction in RTIL's. The results of this study will be presented.



Poster Presentation P10

**THE POTENTIAL EFFECTS OF EGGSHELL POROSITY ON BROWN-HEADED  
COWBIRD AND DICKCISSEL INCUBATION PERIODS**

Brittany Childs, Miranda Kiefer, and Given Harper\* and William Jaeckle\*  
Biology Department, Illinois Wesleyan University

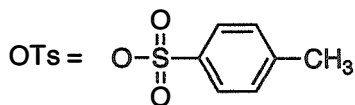
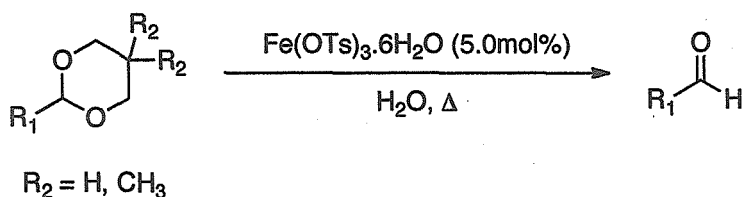
The Brown-headed Cowbird (*Molothrus ater*) is a brood parasite that lays its eggs in nests of other species; the eggs are incubated and the offspring are then raised by the host. Grassland-nesting Dickcissels (*Spiza americana*) are commonly parasitized by Cowbirds. Cowbird eggs have been reported to hatch sooner than equivalently-sized host eggs, giving their hatchlings a competitive advantage over host offspring. Our study focused on the hypothesis that the apparent accelerated development of Cowbirds is caused by greater eggshell porosity which allows for increased availability of oxygen during incubation. The mean pore area of Cowbird eggshells ( $2.043 \pm 0.674 \mu\text{m}^2/\text{mm}^2$ ;  $\bar{x} \pm \text{SD}$ ) was 5 times greater than Dickcissel eggshells ( $0.383 \pm 1.095 \mu\text{m}^2/\text{mm}^2$ ;  $t = 5.772$ ,  $df = 31.598$ ,  $p < 0.001$ ). However, the mean number of pores per eggshell did not differ significantly between Cowbirds ( $0.263 \pm 0.122 \text{ pores}/\text{mm}^2$ ) and Dickcissels ( $0.229 \pm 0.130 \text{ pores}/\text{mm}^2$ ;  $t = 0.846$ ,  $df = 38$ ,  $p = 0.403$ ). The data support our hypothesis that Cowbirds have greater eggshell porosity than their host, which could lead to a shorter incubation period.

Poster Presentation P11, P28

## IRON(III) TOSYLATE CATALYZED DEPROTECTION OF CYCLIC ACETALS

Michael V. Chiodo, Phillip R. Lazzara, Margaret E. Olson, and Ram S. Mohan\*  
Chemistry Department, Illinois Wesleyan University

Cyclic acetals (dioxolanes and dioxanes) are useful protecting groups for aldehydes and ketones in the course of a total synthesis. The standard literature method for their deprotection makes use of *p*-toluenesulfonic acid, which is corrosive and hazardous. Efforts have been made to develop mild and environmentally benign methods for the deprotection of cyclic acetals. We have discovered that iron(III) tosylate is an efficient catalyst for the deprotection of a variety of acetals. The reactions are run in H<sub>2</sub>O as the solvent. Water is the most environmentally benign and cheapest solvent available. In addition, iron compounds are attractive due to their low cost, ease of handling, and low toxicity. The results of this study will be presented.



Poster Presentation P12

**EXPRESSION, PURIFICATION, AND CHARACTERIZATION OF  
PORPHOBILINOGEN SYNTHASE IN *CLOSTRIDIUM PERFRINGENS***

Kristina Dakis and David Bollivar\*  
Biology Department, Illinois Wesleyan University

*Clostridium perfringens* is the most common cause of gas gangrene, a deadly tissue infection around a skin injury or surgical wound. It also is an agent of foodborne illness in the United States. Analysis of porphobilinogen synthase (PBGS) in *C. perfringens* may reveal useful information about an important control point in the metabolism of this human pathogen. PBGS plays a major role in the biosynthesis of natural tetrapyrrole pigments essential to most life forms. Also known as  $\delta$ -aminolevulinic acid dehydratase, it catalyzes the condensation of two molecules of  $\delta$ -aminolevulinic acid (ALA) to form porphobilinogen (PBG). This tetrapyrrole pigment is a precursor to heme, a molecule important to cellular respiration. In this study, host *Escherichia coli* cells were transformed with an expression plasmid containing the *C. perfringens* PBGS gene. Gene expression was induced and various purification techniques were used to isolate the enzyme. Activity assays lead to initial steps in characterization.



Poster Presentation P13

## **THIS IS WHAT FEMINISM LOOKS LIKE**

Hannah Detig and Rebecca Gearhart\*

Sociology and Anthropology Department, Illinois Wesleyan University

After spending a number of weeks attending meetings and getting to know the members of the Feminist Majority League Association (FMLA) on Illinois Wesleyan's campus, I have come to see that there is not one definition or image that can describe this diverse group of women. They are drawn together not by a common understanding of the term *feminism*, but by a deep respect for social justice and human rights. Through employing methods of still photography and collaborative ethnography, it has been made evident that while these women may not have the same understanding of the term *feminism*, they do have a common understanding of what it means to be human. It is by first accepting humanity, that women can find their full and equal rights.

Poster Presentation P14

**DIAGNOSIS OF DEPRESSION AMONG HISPANIC INDIVIDUALS - APPROPRIATE  
METHODS AND MEASURES**

Cassie DeVore and Carolyn Nadeau\*  
Hispanic Studies Department, Illinois Wesleyan University

The diagnosis of mental illnesses in Hispanic individuals has received much criticism within the past decade. The amount of Hispanics that have immigrated to the United States has been on the rise, and this immigration to the United States has involved varying degrees of acculturation. Although newly immigrated Hispanics face a whole new set of challenges compared to Hispanics who have lived in the United States for many years, the obvious language barriers, poor socioeconomic statuses, and the ability to fit in and understand the American culture are all issues that might affect one's mental state. Many individuals, therefore, suffer from this transition into a new culture or suffer from a lack of balance between their own culture and the new culture. These circumstances might, then, correlate with the frequency of mental illness in Hispanics. Depression, in particular, is one serious mental illness that appears in the Hispanic population. Unfortunately, many Hispanics do not receive proper diagnosis for their mental illness and thus do not receive the appropriate treatment. Research has investigated the different measures and methods used to diagnose depression in Hispanics, but these systems have not proven to be valid or reliable. This situation needs to be further researched and changes regarding the diagnosis of depression in Hispanics need to be addressed.

Poster Presentation P15

**THE CROSSFIT COUP D'ETAT: A LOOK AT A DYNAMIC NEW LIFESTYLE  
COMBATING MODERN LETHARGY**

Geoffrey Evans-Grimm and Rebecca Gearhart\*

Sociology and Anthropology Department, Illinois Wesleyan University

What does it mean to be a healthy individual? What do I have to do to achieve this standard? Is there an easy way to lose weight? These questions permeate life in America and we are provided with a plethora of answers involving varying uses of diets, exercises, and medications. But there is one group emerging that is not seeking an easy solution; they recognize the extreme lifestyle change that is necessary to achieve true health and fitness. This new community calls itself CrossFit and was founded by former gymnast, Greg Glassman in 1996. CrossFit methods, although not well known, have a firm grounding in scientific testing and biological evolution. I conducted ethnographic research with a local chapter, CrossFit Bloomington-Normal, to explore the sub-culture that identifies with this new science and healthcare system. I have combined existing scientific research with my collaborative ethnographic fieldwork to explore the cultural identity of people who have chosen CrossFit as a lifestyle.

Poster Presentation P16

**USE OF SLIDE IN-SITU HYBRIDIZATION TO DETERMINE *PAX9* GENE  
EXPRESSION IN *MOENKHAUSIA SANCTAEFILOMENAE***

Golibe Eze-Echesi and Brian Walter\*  
Biology Department, Illinois Wesleyan University

*Pax9* is a paired box transcription factor with essential roles in embryonic development of the skeleton, teeth, thymus and parathyroid regions of the embryo. Our lab has previously cloned *Pax9* from the red eye tetra, *Moenkhausia sanctaefilomenae* and expression analysis during early embryonic development demonstrated that *Pax9* is expressed in the pharyngeal region of the craniofacial skeleton, vertebral somites and tail region. This project examines expression of *Pax9* in larval fish using a technique known as slide in-situ hybridization. This technique allows for detection of *Pax9* transcripts in older specimens, an outcome typically unattainable via whole mount in-situ techniques. *Collagen type II alpha 1 (Col2a1)* was also examined as a control for this technique. Results showed that *Col2a1* is expressed in the basioccipital cartilage and the chondocranium cartilage while *pax9* is expressed in the tissues of the pancreas and liver of the embryo. The success of this slide in-situ technique allows for further examination of later development in fish while possibly using other genes as well.

Poster Presentation P17

## **HYPERTENSION AND HISPANICS: LOWER INCIDENCE OR MISSING DATA?**

Kelsey Farrell and Carolyn Nadeau\*

Hispanic Studies Department, Illinois Wesleyan University

Many studies which sought to find the different rates of hypertension among ethnic groups came to the conclusion that Hispanics have an incidence of hypertension lower than that of non-Hispanic whites. The researchers in many of these studies collected their data by interviewing people and asking, among other demographic questions, "Have you ever been told by a doctor that you have hypertension, also called high blood pressure?" Although this is a good method for finding out the proportions of people who are aware of their hypertension, this is not sufficient for learning how many people actually have hypertension. Since Hispanics are more likely to be uninsured and therefore more likely to go without medical care, they are also more likely to be unaware of their hypertension. This paper seeks to straighten out the conclusions that Hispanics have a lower incidence of hypertension than their non-Hispanic white counterparts, despite a higher incidence of obesity and diabetes, and to find a better method for collecting data on hypertension. To improve the health of Hispanics, future studies should focus on minorities and why the health disparity between them and whites exists. This presentation will be in both English and Spanish.

Poster Presentation P18

**BLOCKING CASPASE ACTIVATION INHIBITS MERLIN FROM INDUCING  
CASPASE-DEPENDENT APOPTOSIS**

Lauren Geary and Dr. Katherine Eaton\* and Dr. Wallace Ip\*  
Biology Department, Illinois Wesleyan University  
University of Cincinnati Department of Cancer and Cell Biology

The tumor-suppressor protein merlin induces apoptosis by an unknown mechanism. Some evidence suggests the involvement of caspase cascades. Caspase dependent cell death can be initiated by exterior death receptors or be in response to an internal stress, with each pathway initiating independent caspase cascades. To identify the mechanism by which merlin-induced apoptosis is achieved, the activation of multiple caspases was prevented using specific caspase inhibitors. Caspase 3 activity was increased in cells expressing endogenous merlin when compared to merlin-null cells. Adding a caspase 8 or 9 inhibitor greatly reduced caspase 3 activity in cells containing endogenous merlin. After re-expression of merlin in merlin-null cells, the addition of a caspase 3 inhibitor caused an even greater increase in the total percentage of apoptotic cells. Thus, caspase inhibition limits merlin's ability to increase caspase 3 activity but does not affect apoptotic rates.

Poster Presentation P19

**AN ANALYSIS OF CONTINUOUS CHEST COMPRESSION CPR FOR EMS PROVIDERS FOR OUT OF HOSPITAL CARDIAC ARREST**

Megan Gleason and Kira Hudson Banks\*  
Psychology Department, Illinois Wesleyan University

Much research has been done to improve the outcomes of patients found in cardiac arrest outside the hospital. The American Heart Association has long advocated Advanced Cardiac Life Support (ACLS), a procedure that encompasses cycles of chest compressions with advanced airway maintenance and defibrillation. Recent evidence has suggested that these current guidelines are ineffective due to prolonged “hands off” time. New research suggests utilizing a technique known as continuous chest compression CPR that delays advanced airway management and instead focuses on defibrillation and continuous chest compressions. Across the country, research has demonstrated that when EMS providers utilize this technique and have support from the receiving hospital, survival to hospital discharge rates have increased from 4.7% (using standard ACLS protocols) to 17.6% (with the new technique). The Newark (OH) Fire Department protocols were modified to implement continuous chest compression CPR for the care of patients in cardiac arrest. The present research analyzes quality improvement (QI) / quality assurance (QA) data from this fire department to determine how the change in protocol affected patient outcome.

Poster Presentation P20

**WINTER ABUNDANCE AND HABITAT PREFERENCE OF RED-TAILED HAWKS  
(*BUTEO JAMAICENSIS*) IN NORTHEASTERN AND CENTRAL ILLINOIS**

Anna Groves and Given Harper\*<sup>1</sup> and Angelo Capparella\*<sup>2</sup>

<sup>1</sup>Biology Department, Illinois Wesleyan University

<sup>2</sup>Department of Biological Sciences, Illinois State University

Though the red-tailed hawk (*Buteo jamaicensis*) is a common raptor found across the United States, no comprehensive study has examined its winter abundance and habitat preference in Illinois since 1960. Winter abundance was determined using five years of winter raptor automobile survey results from northeastern and central Illinois. Red-tails were least abundant in December and most abundant in February [December:  $11.2 \pm 8.3$  ( $\bar{x} + SD$ ) hawks/survey, January:  $11.7 \pm 8.7$ , February:  $14.5 \pm 9.3$ , March:  $12.4 \pm 10.6$ ], which may be due to the presence/absence of migrant birds. Red-tail abundance was highest in 2008-2009 and lowest in 2005-2006 (2004-2005:  $10.4 \pm 7.9$  hawks/survey; 2005-2006:  $9.6 \pm 7.0$  hawks; 2006-2007:  $12.2 \pm 9.1$ ; 2007-2008:  $13.1 \pm 10.5$ ; 2008-2009:  $17.5 \pm 10.5$ ). Adults were observed nearly 10 times more frequently ( $8.6 \pm 7.5$  adults/survey) than immatures ( $0.9 \pm 1.5$  immatures/survey). Habitat preference will be examined based on the hawk distribution patterns along the 50-mile survey routes and analyzed using ArcGIS software and the 2001 National Land Cover Dataset.



Poster Presentation P21

**DETERMINATION OF OPTIMAL CONDITIONS FOR  
*BCHF* ENZYMATIC ACTIVITY**

Casey Hamm and David Bollivar\*  
Biology Department, Illinois Wesleyan University

Photosynthetic organisms possess the unique ability to capture solar energy and utilize it in the formation of carbon compounds from carbon dioxide and water. Without photosynthesis, all life on Earth would be unable to acquire energy in a usable form. Because this energy conversion evolves oxygen, photosynthesis also sustains life by providing it with the atmospheric conditions needed to breathe. The first step in the photosynthetic process involves the absorption of light energy by pigments. While chlorophylls, found in higher plants and algae, are often the most familiar photosynthetic pigments, photosynthetic bacteria utilize a related pigment called bacteriochlorophyll. Study of bacteriochlorophyll and the mechanism of this pigment's biosynthesis can provide further insight into the crucial process of photosynthesis, as well as its evolutionary history. The previously-identified genetic locus *bchF* encodes an enzyme that catalyzes a certain step in the bacteriochlorophyll *a* biosynthesis pathway. Specifically, water adds to a vinyl group at position three of chlorophyllide *a* to form 3-hydroxyethylchlorophyllide. The steps of bacteriochlorophyll biosynthesis have been well-defined genetically, but the specific requirements for *bchF* enzymatic function have not been explored, such as its optimum pH and temperature. The study of *bchF* is significant because an *in-vitro* assay of this enzyme has never been produced; demonstrating that the enzyme is functional *in-vitro* would be an important step forward in understanding the biosynthesis of bacteriochlorophyll *a*. After inserting the gene into three different expression vectors, substantial levels of protein expression could not be obtained. After exhausting most other options, an optimized, artificial *bchF* gene within an expression vector was purchased. Once expression of the artificial gene is confirmed, the next step is to extract pigments from *bchF* mutants. This will allow for enzyme activity testing using the isolated pigment as a substrate. The ultimate objective is to characterize the optimal conditions for *bchF* enzymatic activity and to determine if the *bchF* gene alone is sufficient to catalyze this step in bacteriochlorophyll biosynthesis.

Poster Presentation P22

## **THE EFFECTS OF AUTISM DISCLOSURE ON COWORKER ATTITUDES**

Kathleen Henegan and Linda Kunce\*

Psychology Department, Illinois Wesleyan University

People with autism, despite their potential to be successful employees, face high levels of under- and unemployment. Further, once employed, people with autism tend to have difficulties with the social relationships in the workplace, which are a crucial aspect to maintaining employment. In this study, we investigated whether disclosure of an autism spectrum disorder could be used to improve adults' attitudes toward a potential coworker with autism. Participants (93 college students, 93 working adults) read a vignette describing an interaction with a potential coworker. Participants were randomly assigned to one of three disclosure conditions (No Disclosure, Basic Disclosure, Basic Disclosure plus Tips). As hypothesized, participants in both disclosure conditions, in comparison to participants in the no disclosure condition, reported significantly more positive attitudes (i.e., less nervousness, less avoidance, and more positive thoughts), as well as significantly greater willingness to work with the coworker. In contrast, disclosure had varied effects on social judgments of the coworker's qualities. Disclosure led to increased positive judgments of warmth, but had no significant impact on judgments of competence. This research indicates that disclosure of autism condition to coworkers may be beneficial as it improved their attitudes toward the person with autism which could ultimately improve people with autism's working relationships.

Poster Presentation P23

**THE SYNTHESIS OF A CYCLIC PEPTIDE LIBRARY FOR THE  
DISCOVERY OF SICKLE-CELL HEMOGLOBIN LIGANDS**

Jeremy Henle and Brian Brennan\*  
Chemistry Department, Illinois Wesleyan University

Sickle Cell Disease is a genetically inherited blood disorder that leads to the aggregation of hemoglobin, the oxygen transport protein in the body. This aggregation leads to the formation of the characteristic sickle shape of the red blood cells, which is the cause of the symptoms of the disease. There are currently few treatments for this disorder, with the only cure being a risky bone marrow transplant. My research is focused on trying to find compounds that bind to Sickle Cell hemoglobin in such a way that this aggregation is prevented. One method is to use peptides that bind at the interface of the aggregated hemoglobin. Unfortunately, the use of linear peptides suffers from many drawbacks, including low cell permeability and poor stability in the cellular environment. To circumvent these problems, my work focuses on the use of cyclic peptides to inhibit hemoglobin aggregation. In order to discover cyclic peptides that bind to Sickle Cell hemoglobin, I am synthesizing a focused, cyclic peptide library of 160,000 different peptide sequences. After synthesizing the library, an assay will be performed to determine if any of the constructed cyclic peptides bind to hemoglobin. These ligands may represent the next generation of therapeutics for this debilitating disorder.

Poster Presentation P24

**FINANCIAL STRESS, NEIGHBORHOOD QUALITY, AND WELL-BEING:  
MEDIATIONAL AND MODERATIONAL MODELS**

Amy Kapp and Mignon Montpetit\*

Psychology Department, Illinois Wesleyan University

This study explores how aspects of the community environment might facilitate the stress-and-coping process – specifically, the protective effects of social integration and high quality neighborhoods on psychological well-being. Previous research suggests that low levels of financial stress, positive neighborhood quality, and social integration are each associated with greater levels of well-being; few studies, however, investigate these contextual variables in conjunction with one another. Data from the Notre Dame Study of Health and Well-Being were used to investigate whether (1) neighborhood quality moderates the relationship between financial stress and psychological well-being and (2) social integration mediates the relationship between neighborhood quality and psychological well-being. Although the results did not support the moderational hypothesis, *post hoc* analysis did indicate that neighborhood quality mediates the financial stress psychological well-being relationship. Data supported hypothesis 2. From an ecological systems perspective, these results suggest that proximal contextual variables such as social integration and neighborhood quality can buffer individuals' psychological well-being from the negative effects of less proximal contextual variables, such as economic conditions.

Poster Presentation P25

**COMPARATIVE ANALYSIS OF THE SUBUNIT INTERFACES OF A MORPHEEIN  
FOR DIFFERENT SPECIES OF ORGANISMS**

Kyleigh Kirbach, Trevor Selwood, Eileen K. Jaffe and David Bollivar\*  
Biology Department, Illinois Wesleyan University

A morpheein is a protein that has the ability to exist in multiple monomer conformations dictating structurally and functionally different quaternary structures. The presence of different quaternary structures has provided an explanation for allosteric regulation of protein activity (Jaffe, 2005). Porphobilinogen synthase (PBGS) is currently the only confirmed morpheein, but many other proteins found in the literature display similar characteristics. Further analysis of these putative morpheeins was undertaken using the crystal structures of the enzyme. Occasionally, information pertaining to the enzymatic characteristics of a putative morpheein from one species of organism is available, but the crystal structure is not. Therefore, this study was undertaken to analyze if the subunit interfaces of a putative morpheein existing in two different species of organism were similar enough to assume similar dissociation behavior. If the subunit interfaces between two species of an organism are highly conserved, it is hypothesized that water molecules, which aid in dissociation of the subunits, will accumulate similarly at the interfaces. Hence, dissociation behavior will be similar. The Protein Data Bank was used to attain protein crystal structures and NCBI FASTA sequences were used with the Jalview sequence alignment program to find the conserved sequences between species. Conserved sequences were labeled on the crystal structure using Swiss View PDB and those located at the subunit interfaces were recorded. The percentage of residues conserved at the interface was then calculated. 44.63% of interface residues were conserved for adenylosuccinate lyase, 57.80% were conserved for aristolochene synthase, and 47.69% were conserved for glutamate racemase. These results can be used to indicate the predictability of the dissociation patterns of protein subunits among different species for a particular putative morpheein.

Poster Presentation P26

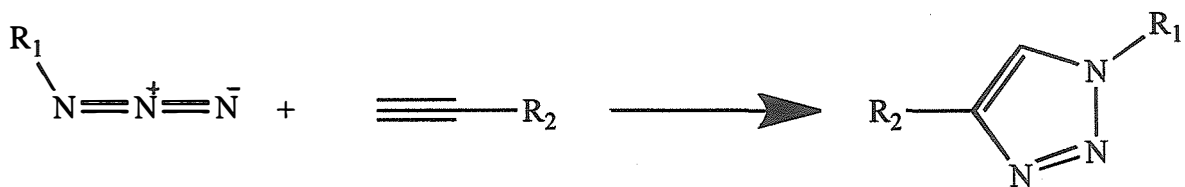
**MACROCYCLIC PENDANT ARM EXTENSION: AN APPLICATION OF THE  
HUISGEN 1,3-DIPOLAR CYCLOADDITION REACTION**

Cory Kline and Rebecca Roesner\*

Chemistry Department, Illinois Wesleyan University

Click chemistry reactions are simple, one-step processes that ideally have readily available starting materials, simple reaction conditions, and give high yields of a single product.

These reactions are widely used in both medicinal and materials chemistry and have attractive characteristics for use in the assembly of supramolecular systems. Application of the Huisgen 1,3-dipolar cycloaddition reaction between azides and alkynes, a common "click" reaction, was explored. A known macrocycle with four alkyne functional units was reacted with benzyl azide under several reaction conditions, including both catalyzed and uncatalyzed Huisgen 1,3-dipolar cycloaddition reactions. The results of this study will be presented.

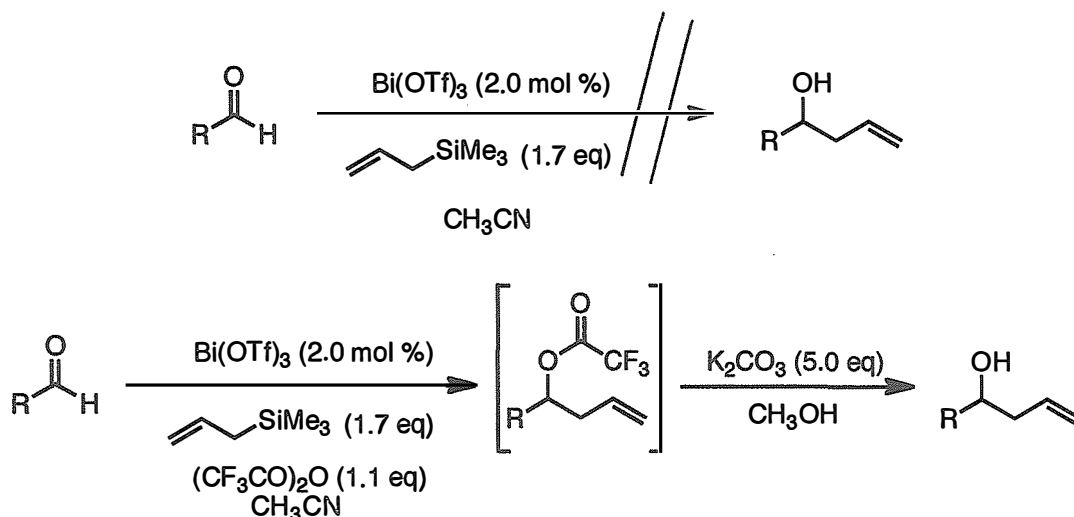


Poster Presentation P27

# BISMUTH(III) TRIFLATE CATALYZED ALLYLATION OF ALDEHYDES TO YIELD HOMOALLYL ALCOHOLS

Scott W. Krabbe and Ram S. Mohan\*  
Chemistry Department, Illinois Wesleyan University

The formation of carbon-carbon bonds is especially important in the course of a total synthesis. A common method for the formation of carbon-carbon bonds is the Hosomi-Sakurai reaction. This method involves the titanium tetrachloride ( $\text{TiCl}_4$ ) promoted allylation of aldehydes by allyltrimethylsilane.  $\text{TiCl}_4$  is an extremely corrosive Lewis acid that is often required in stoichiometric amounts. Our continued interest in bismuth(III) salts as catalysts prompted us to investigate a Hosomi-Sakurai reaction of aldehydes catalyzed by bismuth(III) triflate. While bismuth(III) triflate is not an efficient catalyst for allylation of aldehydes using allyltrimethylsilane, the addition of trifluoroacetic anhydride allows capture of the putative alkoxide intermediate to give a homoallyl trifluoroacetate product, and subsequent hydrolysis yields the desired homoallyl alcohol. Bismuth(III) triflate is an attractive catalyst because of its low cost, low toxicity, and ease of handling. The results of this study will be presented.

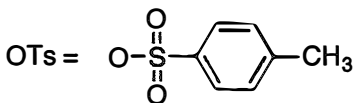
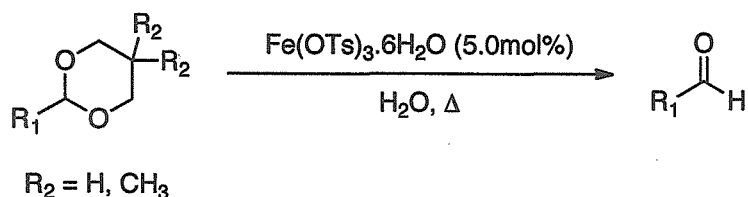


Poster Presentation P11, P28

## IRON(III) TOSYLATE CATALYZED DEPROTECTION OF CYCLIC ACETALS

Michael V. Chiodo, Phillip R. Lazzara, Margaret E. Olson, and Ram S. Mohan\*  
Chemistry Department, Illinois Wesleyan University

Cyclic acetals (dioxolanes and dioxanes) are useful protecting groups for aldehydes and ketones in the course of a total synthesis. The standard literature method for their deprotection makes use of *p*-toluenesulfonic acid, which is corrosive and hazardous. Efforts have been made to develop mild and environmentally benign methods for the deprotection of cyclic acetals. We have discovered that iron(III) tosylate is an efficient catalyst for the deprotection of a variety of acetals. The reactions are run in H<sub>2</sub>O as the solvent. Water is the most environmentally benign and cheapest solvent available. In addition, iron compounds are attractive due to their low cost, ease of handling, and low toxicity. The results of this study will be presented.





Poster Presentation P29

**SYNTHESIS OF A THIRTY MEMBER MACROCYCLE FOR USE IN  
HOST-GUEST CHEMISTRY**

Keith A. Lehuta and Rebecca Roesner\*

Chemistry Department, Illinois Wesleyan University

Host-guest chemistry is the study of non-covalent interactions between container molecules and their neutral or ionic guests. Host-guest chemistry has applications in the pharmaceutical and fragrance industries and in the development of chemical sensors. The host-guest chemistry of interest in this study is that between polyoxometalate guests and azamacrocyclic hosts. A polyoxometalate is large polyatomic anion composed of early transition metal atoms, oxygen atoms, and sometimes heteroatoms. In this work, a thirty-membered macrocycle, that contains amine groups (Figure 1) is being prepared as a host for polyoxometalate guests. The two part synthetic strategy employed was first reported by Korendovych et. al for a related macrocycle. Under neutral conditions, the amine groups of the macrocycle will be able to interact with the polyoxometalate through ion-dipole forces. Under acidic conditions, the amine groups would be protonated, and the resulting ammonium groups would interact with the polyoxometalate through ion-ion forces.

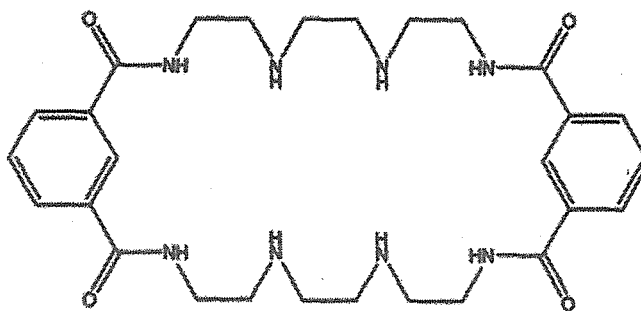


Figure 1

Poster Presentation P30

**USING POLYSTYRENE BEADS TO ESTIMATE FEEDING SELECTIVITY AND  
POTENTIAL ENERGETIC CONSEQUENCES IN THE ROTIFER,  
*BRACHIONUS PLICATILIS***

Stephen Little and William Jaeckle\*  
Biology Department, Illinois Wesleyan University

Rotifers are free-swimming aquatic animals that feed by collecting particles through the use of cilia that are arranged around the mouth in two circular whorls. Specimens of *Brachionus plicatilis* exposed to 6 $\mu$ m and 0.5 $\mu$ m polystyrene beads (together or separately) captured the particles at significantly different rates. Calculation of the Jacob's Selectivity Index (D) revealed a significant selectivity for the larger (6 $\mu$ m) beads, over the smaller (0.5 $\mu$ m) beads ( $p < 0.001$ ), and the presence of 6 $\mu$ m beads negatively affected the capture of 0.5 $\mu$ m beads ( $p < 0.001$ ). We propose that the clearance rate (volume cleared of particles / time) of 0.5 $\mu$ m beads approximates fluid transport rates through the digestive system, and represents the mechanism of capture of bacteria-sized particles. Comparison of food intake through bacterial feeding to the metabolic rate of *B. plicatilis* revealed that bacteria are not likely a significant energy source. Bacterial concentration  $\geq 10^8$  cells/ml (100x typical values) are necessary for feeding on bacterial to support at least 33% of the metabolic demand.

Poster Presentation P31

**EXPRESSION OF CRANIAL NEURAL CREST GENES IN  
*MOENKHAUSIA SANCTAEFILOMENAE***

Harirajan Mani and Brian Walter\*

Biology Department, Illinois Wesleyan University

Neural crest cells are multipotent embryonic cells that migrate from their origins and populate various sites in the embryo. In the head, the cranial neural crest cells (CNC), migrate ventrally to differentiate into cartilage and bones that form the craniofacial skeleton. Several genes are thought to be involved in this process by controlling cell specification, cell survival, and cell migration/differentiation (Kuriyama & Mayor 2007). Our research examines the expression of CNC genes such as *Foxd3*, *Collagen IIa1*, *Snail 1*, *Snail 3*, and *Faciogenital Dysplasia (FGD)* in *Moenkhausia sanctaefilomenae*. Via the process of whole mount *in situ* hybridization, the gene expressions were analyzed. At various developmental stages, specific genes have distinct patterns of expression that change over time. Also, during the same developmental time frame, different genes have different expression domains. These results suggest the differing roles for genes during the development of cranial neural crest cells.

Poster Presentation P32

## **RELIGIOUS ORIENTATION AND POLITICAL PARTICIPATION**

Anne Marquette and Carolyn Brown Kramer\*  
Psychology Department, Illinois Wesleyan University

Churches and other religious groups have been the foundation for major social and political movements throughout American history (Djupe & Grant, 1999) and religious organizations show significantly higher levels of political participation as compared to other non-political organizations (Beyerlein & Chaves, 2003). This study will examine the relationship between religiosity and political participation among Illinois Wesleyan University students using the Religious Orientation Scale developed by Allport and Ross (1967). This scale measures religious motivation, separated into intrinsic and extrinsic religious orientation. Intrinsically oriented individuals are more motivated by the spiritual and belief aspects of religion, while extrinsically oriented individuals are more motivated by the personal and social benefits of belonging to a religion (Allport & Ross, 1967). While some researchers claim that the spiritual or dogmatic tenets of a religion may lead to increased political participation (Gorsuch & Ortberg, 1983), we hypothesized that the social network provided by religious organizations would better predict a relationship between religiosity and political participation.

Poster Presentation P33

**ELECTROCHEMICAL ASSAY OF SPECIFIC BIOLOGICAL COMPOUNDS USING  
SCANNING ELECTROCHEMICAL MICROSCOPY**

Thomas Marlow, Aaron Moore, and Melinda Baur\*  
Chemistry Department, Illinois Wesleyan University

Scanning Electrochemical Microscopy (SECM) is a useful tool for analysis of biological samples because it is capable of detecting both the topography of the cell surface as well as release of electrochemically active compounds. A fabricated ultramicroelectrode controlled by the SECM was used to scan across the cell surface at a constant distance. The constant distance from the cell was maintained by using a feedback loop that measured the impedance between the tip of the electrode and the reference electrode. Because the topography of the cell could be determined by recording the movement of the electrode in response to impedance measurements, the potential of the electrode could be set to measure specific oxidations or reductions occurring at the cell surface. The SECM has been used to successfully combine characterization of cell topography with simultaneous electrochemical evaluation of the cell surface. Release of electrochemically active compounds from the cell surface has been detected by changes in the current measured at the tip of the ultramicroelectrode. The goal of this project is to develop an electrochemical assay to detect specific molecules on the cell surface using the SECM.

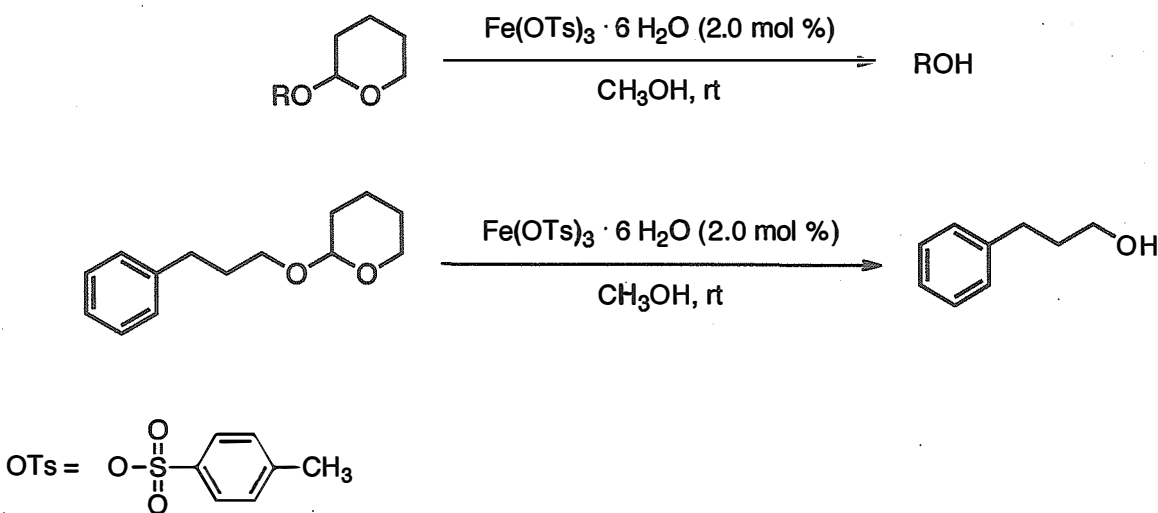
Poster Presentation P1, P34

## IRON (III) TOSYLATE CATALYZED DEPROTECTION OF TETRAHYDROPYRANYL ETHERS

Veronica V. Angeles, Julia M. Martino and Ram S. Mohan\*

Chemistry Department, Illinois Wesleyan University

Tetrahydropyranyl (THP) ethers are a common protecting group for alcohols and phenols in the course of a total synthesis due to their ease of preparation and removal, and their stability to strongly basic conditions, hydrides, and alkylation reagents. A common method for the deprotection of THP ethers involves acidic hydrolysis using *p*-toluenesulfonic acid in methanol or pyridinium *p*-toluenesulfonate in ethanol. Both these reagents are corrosive and difficult to handle. Other methods include the use of toxic or expensive catalysts such as tris(4-bromophenyl)aminium hexachloroantimonate (TBPA<sup>+</sup>SbCl<sub>6</sub><sup>-</sup>) in methanol and PdCl<sub>2</sub>(CH<sub>3</sub>CN)<sub>2</sub> in wet CH<sub>3</sub>CN under reflux conditions. We have developed a catalytic method for the deprotection of THP ethers in methanol using iron(III) tosylate as a catalyst. Iron(III) tosylate is an attractive catalyst because of its relatively low cost, low toxicity, and ease of handling. The results of this study will be presented.



Poster Presentation P35

**THE SIERRA STUDENT COALITION: SUSTAINABILITY UNITES, DIVERSE INTERESTS CONNECT, AND THE CAMPUS BECOMES GREENER**

Megan Mealer and Rebecca Gearhart\*

Sociology and Anthropology Department, Illinois Wesleyan University

The Sierra Student Coalition, or SSC, contains a diversity of environmentally aware people whose main goal is to promote sustainability and show how protecting the environment affects everything in the realm of human condition. The people in the group make choices in their own lives and encourage and influence others to make the same choices in order to better the life of the earth and in turn, everyone in the world. Because of their awareness of how harming the environment affects people, nature, and the earth in general, they want to share this awareness with everyone in order to realize the goal of an over all healthier, cleaner world. Though combing the diversity of interests into one cohesive action may be an obstacle, the general goal of sustainability brings the members of the group together to share with the campus the purpose of sustainability and the reason why everything is affected by environmental issues.

Poster Presentation P36

**BACTERIA NOT AN ENERGETICALLY FAVORABLE FOOD SOURCE FOR  
LARVAE OF *ARTHEMIA SALINA***

Kenny Moore and William Jaeckle\*  
Biology Department, Illinois Wesleyan University

Larvae of the crustacean *Artemia salina* are reported to differentially ingest food particles of different sizes. We exposed 2-to-5-day-old *A. salina* larvae to equal volumetric concentrations (bead volume per mL) of 6  $\mu\text{m}$ -diameter and 0.5  $\mu\text{m}$ -diameter polystyrene beads. The clearance rate (volume cleared of particles per unit time) of each bead size was positively correlated with developmental stage of the larvae ( $r=0.598$ ,  $p<0.0001$  for 6  $\mu\text{m}$  beads;  $r=0.610$ ,  $p<0.0001$  for 0.5  $\mu\text{m}$  beads). The average clearance rate for all larvae exposed to 6- $\mu\text{m}$  beads ( $3.88 \pm 2.15$   $\mu\text{l/hr}$ , mean  $\pm$  SD) was significantly and 69 times greater than that of larvae exposed to 0.5- $\mu\text{m}$  beads ( $0.0560 \pm 0.0234$   $\mu\text{l/hr}$ , mean  $\pm$  SD). These clearance rates suggest that large cells (6- $\mu\text{m}$  particles) contribute significantly to fulfilling the energetic demands of the larvae (as calculated from published values of estimated metabolic rates) while bacteria-sized particles (0.5- $\mu\text{m}$  diameter) do not.



Poster Presentation P37

## **AGGRESSIVE BEHAVIOR: LEARNED OR INSTINCT**

Ross Pingolt and James Dougan\*

Psychology Department, Illinois Wesleyan University

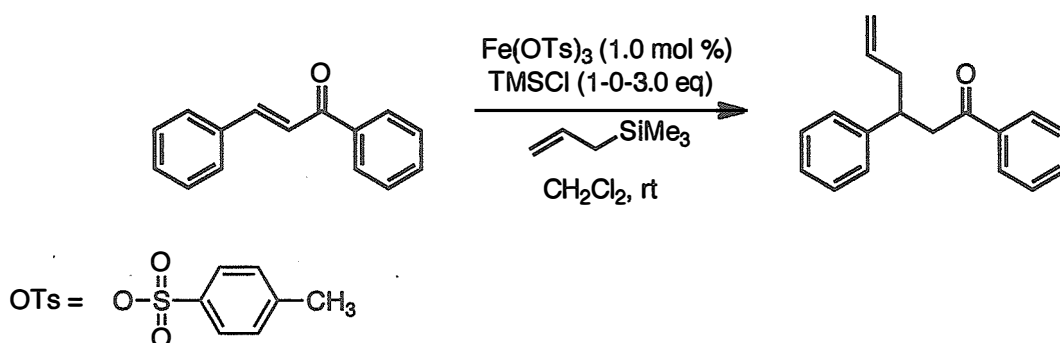
For many years people have argued about whether violent individuals are violent by nature or have been taught to be violent through environments that rewarded such behavior. This study attempted to help determine the role instinct and environmental stimuli each play in causing aggressive behavior between rats competing for food. This was determined by observing whether or not an omission procedure, which ensured that certain rats would never be reinforced for aggressive behavior, had an effect on the amount of aggressive behavior the rats engaged in. There was not a significant difference between the rats in the omission procedure and the rats in the control group in the amount of aggressive behavior they elicited. This would suggest that it was not operant conditioning, but instead possibly instinct or some other innate mechanism, which was the cause of the behavior, if it were not for the fact that the rats in the omission procedure group appeared to be receiving reinforcement for their aggressive behavior through secondary reinforcers.

Poster Presentation P38

## IRON(III) TOSYLATE CATALYZED ALLYLATION OF CHALCONES

Daniel M. Podgorski and Ram S. Mohan\*  
Chemistry Department, Illinois Wesleyan University

One of the most efficient ways of accomplishing an allylation is via the Hosomi-Sakurai reaction, which involves a Lewis acid promoted allylation of electrophiles, such as an aldehyde, ketone, or an acetal. The most common allyl group source for these reactions is allyltrimethylsilane. However, a stoichiometric amount of the Lewis acid, most commonly the highly corrosive titanium tetrachloride,  $\text{TiCl}_4$ , is often required to obtain reasonable reaction rates and yields. A catalytic method involving indium(III) chloride in the presence of trimethylsilylchloride (TMSCl) has been recently reported in the literature. Indium chloride is expensive and moisture sensitive, thus making it difficult to handle. We now report a iron(III) tosylate catalyzed method for the allylation of a variety of substituted chalcones using allyltrimethylsilane, in the presence of TMSCl. Chalcones are aromatic ketones that form the structural backbone of a variety of natural products. Therefore, chalcones can serve as useful starting scaffolds in the total synthesis of biologically active natural products. Iron(III) tosylate is an attractive catalyst because of its low cost, low toxicity, and its high ease of handling. The results of this allylation study will be presented.



Poster Presentation P39

**UPTAKE AND ASSIMILATION OF DISSOLVED ORGANIC MATTER BY *BOSMINA LONGIROSTRIS* (CRUSTACEA: CLADOCERA)**

Nikki Preston and William Jaeckle\*  
Biology Department, Illinois Wesleyan University

A considerable amount of dissolved organic matter (DOM) exists in freshwater environments (5-40  $\mu\text{g/mL}$ ). However, freshwater invertebrates, including crustaceans, are viewed as incapable of taking up and metabolically utilizing DOM. We evaluated this hypothesis by exposing the freshwater crustacean *Bosmina longirostris* to labeled proteins and polysaccharides. Individuals readily ingested these materials as evidenced by the presence of molecule-specific labels in the digestive system. Histological examination of specimens exposed to the protein ferritin revealed that the label was in the lumen of the digestive tract but not in the surrounding cells. Digestion in crustaceans is extracellular, and the absence of a label within cells is not necessarily unexpected. *Bosmina longirostris* is capable of supplementing its diet of particulate foods through the acquisition and assimilation of DOM from its environment.

Poster Presentation P40

## **LEADERSHIP IN COLLEGE: STUDENTS' EXPECTATIONS AND VALUES**

Ryan Quinn and Jennifer Daniels\*

Psychology Department, Illinois Wesleyan University

Knowing students' expectations of college can help to predict what their attitudes towards leadership and involvement are prior to stepping foot on a collegiate campus. Routinely measuring and analyzing this information can help current campus orientation, residential life, and first year colloquium services target their programs to best fit the needs of the incoming students.

This project measures incoming and current first year college students' expectations, values, and leadership styles, against the same expectations, values, and leadership styles. By quantifying high school leadership training, personal ideals about leadership styles, predicted/actual on campus leadership behaviors and demographic information, we can explore the potentially differing leadership training expectations and needs in new IWU students. Ultimately, the goal of this project is to analyze these factors longitudinally to better study the dynamic changes that occur in an incoming first year student, from before they step on campus and until the end of their first year of college. Possessing this data will potentially provide student services personnel with a guide for tailoring their first year programs to best match the expectations and values of the first year students and thus helping to positively encourage and shape their involvement patterns and leadership opportunities.

Poster Presentation P41

**EFFECTS OF TEMPERATURE ON THE INTRACAPSULAR EMBRYONIC  
DEVELOPMENT OF THE FRESHWATER GASTROPOD *PHYSA ACUTA***

Alyssa Ray and William Jaeckle\*  
Biology Department, Illinois Wesleyan University

Temperature is an important factor regulating the growth and development of organisms. I studied the effect of temperature on the development of the freshwater gastropod *Physa acuta*. Egg capsules from thirteen separate egg masses were isolated and distributed among three environmental temperatures (22°C, 25°C, and 28°C) and checked daily. Capsule and juvenile dimensions and hatching time were recorded for each egg capsule. Data analysis confirmed that increased temperature had a significant acceleratory effect on embryonic developmental rate for all egg masses. In 85% of the egg masses temperature also had a significant and positive effect on juvenile snail size, but no influence on shell shape. When all data were pooled, juvenile length and juvenile volume were not correlated with capsule size ( $r > 0.03$ ,  $p = 0.65$ ), but hatch day was negatively related to capsule size ( $r = -0.18$ ,  $p = 0.007$ ). Among egg capsule size groups, average hatch day and juvenile size were significantly different ( $p < 0.001$ ) among temperatures treatments. Data analysis of the larger group revealed the same observed effects of temperature as those described previously, when all egg masses were considered. Analysis of the smaller group, however, indicated no significant difference in days to hatching between 22°C and 25°C, though each was significantly less than that at 28°C. Additionally, a significant difference in both juvenile length and juvenile volume was found between 22°C and 28°C for this group, although neither temperature was significantly different from 25°C.

Poster Presentation P42

**FAITH AND FAMILY: IMAGES OF THE LUTHERAN CHURCH AS FAMILY IN  
ERICH LOEST'S *NIKOLAIKIRCHE***

BethAnne Roberts and Sonja Fritzsche\*  
German Department, Illinois Wesleyan University

Throughout the end of the 1980s the Lutheran Church in the German Democratic Republic (GDR) experienced a surge of attendance and social activism in an otherwise secularized society. Research shows that the church was the sole island of government accepted dissent within the communist GDR. St. Nicolas Church in the city of Leipzig became the prototype of social involvement; visionary pastors opened their doors to every citizen and provided a space for congregations to voice concerns, organize interest groups, and plan peace protests. The construction of an open environment in which citizens could speak and interact gave rise to a greater sense of acceptance and understanding within its community. This presentation will examine the extent to which Erich Loest in his novel *Nikolaikirche* explores the role of the church as surrogate family through the protagonist Astrid Protter. Loest constructs a severe contrast of familial rejection and personal hindrance in Protter's life with the acceptance and self-actualization she finds at the St. Nicolas Church Monday night prayer meetings. The poster will investigate how involvement from citizens like Protter seeking acquiescence led to the largest peaceful demonstration in the GDR before the fall of the Berlin Wall.

Poster Presentation P43

**EXAMINING THE RELATIONSHIP BETWEEN SELF-EFFICACY  
AND STIMULUS PROCESSING**

Peter Rosen and Jason Themanson\*  
Psychology Department, Illinois Wesleyan University

Self-efficacy (SE) is a modifiable psychosocial factor related to individuals' beliefs in their capabilities to successfully complete courses of action and is positively associated with task performance (response accuracy and speed). The authors hypothesized that SE may improve performance by enhancing stimulus processing during task performance. To assess this hypothesis, we examined the relationships between SE and behavioral and neural indices of stimulus processing during the completion of two sessions of a modified flanker task. The first session was completed to determine if SE was related to behavioral and neural indices of stimulus processing while the second session was included to examine whether alterations in SE would lead to corresponding alteration in stimulus processing. In total, 76 healthy young adults completed the experiment and were exposed to either, false positive (24), false negative (26), or no performance (26) feedback after the first session to alter their task SE. Behavioral indices included response accuracy and response time (RT), and neural indices included the P3b, an event-related brain potential associated with stimulus processing. Results showed that higher SE was associated with greater response accuracy, P3b amplitude, and faster RT during task execution in the first session. After SE manipulation, results indicated a significant effect of the feedback manipulation on SE, but no significant influences on P3b, accuracy, reaction time, or changes in those measures across sessions. These findings suggest that SE is beneficially related to neural and behavioral indices of stimulus processing and improved stimulus processing may help explain the association between SE and improved task performance. However, manipulations of task-related SE are not sufficient to significantly improve subsequent stimulus processing.

Poster Presentation P44

**THE HIJAB: MUSLIM WOMEN'S PERSPECTIVES ON VEILING IN  
THE UNITED STATES**

Christina Salazar and Rebecca Gearhart\*

Sociology and Anthropology Department, Illinois Wesleyan University

This poster presentation focuses on the importance of the headscarf, or *hijab* among modern day Muslim (Islamic) women in the United States of America. Through the use of visual and ethnographic research methods, the ideology, motivations, and challenges that accompany wearing the *hijab* are explored. The participants and the ethnographer have worked collaboratively to produce this project by using participant observation, formal and informal interviews among women of the Islamic community, as well as photo documentation and analysis. Through this collaboration, the *hijab* is portrayed as a symbol of uniqueness and cultural pride among contemporary Muslim women in the USA.



Poster Presentation P45

**SCREENING *STAPHYLOCOCCUS AUREUS* TRANSPOSON MUTANTS FOR  
ALTERED NUCLEASE ACTIVITY**

Jennifer Sanderson, Matthew Thoendel, Jeffrey Kavanaugh and Alexander R. Horswill\*  
Biology Department, Illinois Wesleyan University  
Department of Microbiology, University of Iowa

Recent studies show that extracellular DNA (eDNA) and nuclease play integral and antagonistic roles in *Staphylococcus aureus* biofilms. Release of eDNA into the biofilm matrix as a result of cell lysis takes place during initial attachment and development, while an increase in nuclease activity occurs during dispersal and decomposition. While studies demonstrate that the *cidA* and *lrg* operons help to control cell lysis and genomic DNA release, the genetic regulation of nuclease activity remains undefined. This study used transposon mutagenesis to create *S. aureus* mutants, and developed a fluorescent nuclease assay to screen these mutants for altered nuclease activity. By performing arbitrary PCR and DNA sequencing on the mutants that exhibited considerable increases or decreases in activity, we uncovered several genes potentially involved in the regulation of nuclease activity. With further investigation we hope that these genes provide insight not only into the regulation and activity of *S. aureus* nuclease, but also its role in the detachment of biofilms.

Poster Presentation P46

**LUCK BE A LADY: AN EXPLORATION OF THE BLOOMINGTON BINGO  
COMMUNITY THROUGH VISUAL ETHNOGRAPHIC METHODS**

Monica Simonin and Rebecca Gearhart\*

Sociology and Anthropology Department, Illinois Wesleyan University

The aim of this poster presentation is to provide a glimpse into a world to which few have access; the world of Bingo. Through participant-observation, survey elicitation, informal interviews, and the collaborative production of photographs, members who belong to the world of Bingo are revealed. By utilizing collaborative ethnographic methods, Bingo players highlighted issues important to playing the game such as superstition, luck and chance. In this presentation, the motivations behind Bingo players are explored including: dedication to the game, seeing friends, the rush of adrenaline that comes with playing, and winning money. The combination of these factors creates die-hard Bingo fans, who turn the game of Bingo into a serious matter.

Poster Presentation P47

**ATTITUDES TOWARD DIVERSITY AMONG WHITE COLLEGE STUDENTS:  
RELATIONSHIP WITH GENDER, YEAR IN SCHOOL, OPENNESS, AND  
COLORBLIND RACIAL ATTITUDES**

Amanda Sobottka and Kira Hudson Banks\*  
Psychology Department, Illinois Wesleyan University

Previous research has illustrated numerous benefits of experiencing diversity, notably in college. These benefits include heightened intellectual, racial or cultural, and citizenship engagements. Diversity involvement may also reduce racial prejudice. Despite these documented factors, not all students have positive attitudes toward diversity initiatives or the topic of race in particular. Specifically, research suggests that White college students are less likely to engage in diversity-related experiences. Fostering positive attitudes toward diversity and general awareness about diversity-related constructs might enhance the benefits of a diverse campus, especially for White students. However, correlates of positive attitudes toward diversity must first be explored to determine what influences these beliefs. This study examined the relations of gender, year in school, openness to experience, and colorblind racial attitudes with respect to attitudes toward diversity. Participants were White undergraduate students from a small, private, liberal arts college. Results and their implications will be discussed.

Poster Presentation P48

## **THE ACCURACY OF SELF-REPORTED INTUITIVE AND ANALYTICAL ABILITY**

Jennifer A. Sobyra and Jean E. Pretz\*

Psychology Department, Illinois Wesleyan University

The current study aimed to establish whether individuals can accurately report their experiential (intuitive) and rational (analytical) processing abilities on the Rational-Experiential Inventory (REI) in relation to their performance on the Serial Reaction Time (SRT) and the Operation Span (Ospan) tasks. Previous research has indicated that the rational subscale may have predictive validity, but evidence of the predictive validity of the experiential subscale has been mixed. To determine why previous researchers have struggled to establish this link, a manipulation of the knowledge of the psychological definition of intuition and its value in cognitive processing was provided. We hypothesized that the manipulation might have an impact on the correlations between self-reported intuitive ability and performance on the SRT, and that there would be a correlation between self-reported analytical ability and performance on the Ospan in both conditions. The results indicated that experiential favorability scores and the accuracy of self-reported rational favorability scores differed by condition, but that all participants, regardless of condition, struggled with accurately reporting their intuitive ability. The implications for the use of self-report measures of intuitive and analytical ability are discussed.

Poster Presentation P49

**GETTING HIGH:  
AN INSIDE LOOK INTO COLLEGE STUDENTS' LIFE WITH TYPE 1 DIABETES**

Amber Spiewak and Rebecca Gearhart\*  
Sociology and Anthropology Department, Illinois Wesleyan University

Using the visual media of photography and collaborative ethnographic research methods, this poster presentation aims to gain insight into the life of college age students who live with Type 1 Diabetes. By utilizing participant observation and group interviews, the ethnographer worked collaboratively with the students who live with Type 1 Diabetes to create photographs and captions that define them as a unique group. The research not only allows for outsiders to see the hardships the group has to face when dealing with the highs and lows of sugar levels, carbohydrate counting, and balancing a college life, but also allows the group to reflect on how they view themselves. The research highlights the importance of distinguishing between Type 1 and Type 2 Diabetes for the participants.

Poster Presentation P50

**DEVELOPMENT OF A MULTIFACTORED MEASURE OF GENDER:  
IDENTITY AND EXPRESSION**

Erin Strauts and Jennifer Daniels\*

Psychology Department, Illinois Wesleyan University

Biological sex and psychological gender have been recognized as separable but often related personal characteristics. While biological sex is typically directly self reported, measurement of gender has been collected using the Bem Social Role Inventory or the Personal Attributes Questionnaire. Both of these surveys measure the extent to which a person fits in with the expected behaviors for males and females of the culture. However, these measures need to be updated and broadened to reflect our changing culture as well as to better discriminate between different facets of gender, including gender identity and gender expression. We have gathered self report data about university students' experiences with gender and have developed a comprehensive measure of gender, gender identity and gender expression. These are assessed as separate concepts that show variability in many individuals, an idea that has typically be studied in only transgender populations. This measure of gender will allow more detailed research into the causes of gender variation and its impact on our lives as well as begin to support a more comprehensive theory of the construction and operationalization of gender.

Poster Presentation P51

**HISPANICS AND DIABETES: MANY PROBLEMS BUT MANY ANSWERS**

Brooke Stevens and Carolyn Nadeau\*

Hispanic Studies Department, Illinois Wesleyan University

According to the American Diabetes Association, as of 2007, 23.6 million children and adults in the United States have diabetes. However, only 17.9 million of those cases have been diagnosed. Diabetes is a serious disease involving the production of insulin in the pancreas or lack thereof. It is important to diagnose the disease early on and take appropriate measures immediately in order to eliminate future complications such as problems with the heart, kidneys, eyes, and skin. There are many steps that can be taken to prevent or prolong the effects of the disease and maintain the disease once diagnosed. Among those affected by diabetes, Hispanics have twice as many cases than white/non-Hispanics. This is not only due to genetics but also poor eating habits and lack of physical activity, which are outside factors that can be altered with education about the disease. There are many programs geared towards the Hispanic population in order to stop the diabetes epidemic. This will be a bilingual poster presentation.

Poster Presentation P52

## SYNTHESIS OF POLYAZAMACROCYCLE MOLECULAR TWEEZERS AS A HOST FOR POLYOXOANIONS

Marie Sutor, Ronald Grider and Rebecca Roesner\*  
Chemistry Department, Illinois Wesleyan University

Host-guest chemistry concerns the design of receptor molecules that complement their targeted guests with respect to size, shape, and charge. One common area in host-guest chemistry involves the design of molecular tweezers, which are shown schematically in Figure 1.

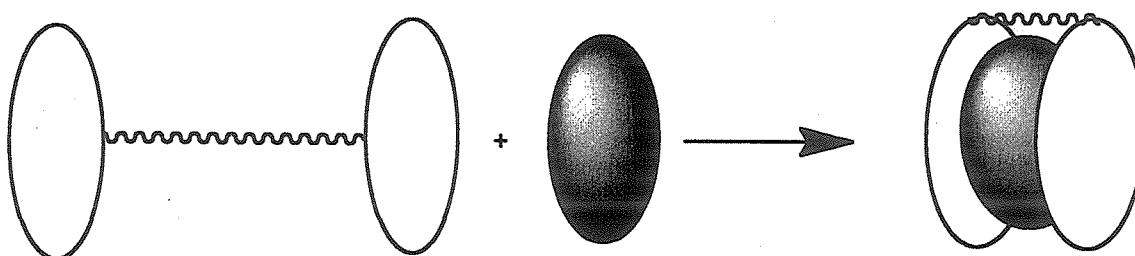


Figure 1. Schematic representation of molecular tweezers grasping a guest molecule.

Molecular tweezers have been developed to grasp a wide variety of neutral, cationic, and anionic guests. This study is directed toward the development of molecular tweezers for polyoxoanion guests. Because polyoxoanions are large, approximately spherical in shape, and negatively charged, they are complementary to the polyazamacrocyclic cations that will serve as pincers in the proposed molecular tweezers (Figure 2).

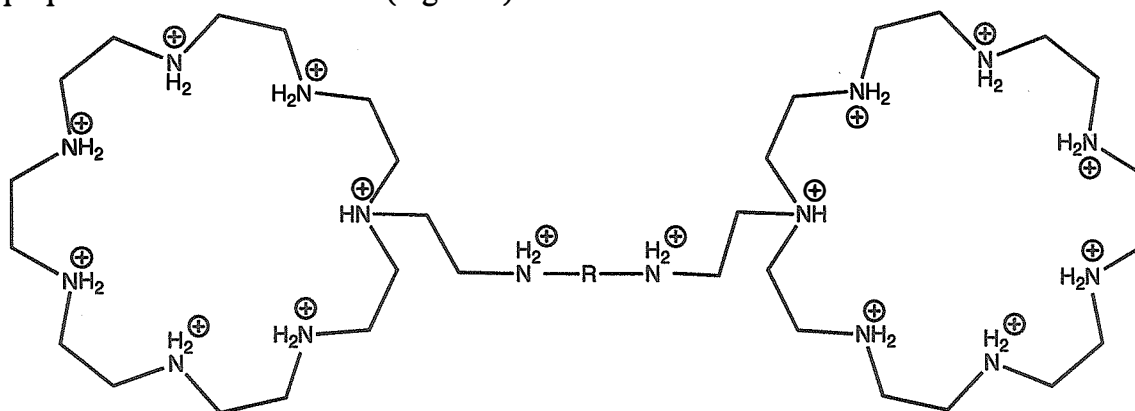


Figure 2. Proposed design of a molecular tweezers for polyoxoanion guests.

Toward these synthetic goals, the methods of Zhong, Mikkola, and Lönnberg are being employed in the multi-step synthesis of 1-ethylamino-1, 4, 7, 10, 13, 16, 19-heptaazacycloheicosane. Synthetic intermediates have been characterized by melting point and  $^1\text{H}$  NMR.



Poster Presentation P53

**VISUAL PERSPECTIVES OF THE TWIN CITY CHESS CLUB**

Morgan Tarbutton and Rebecca Gearhart\*

Sociology and Anthropology Department, Illinois Wesleyan University

While conducting collaborative ethnographic research with the *Twin City Chess Club*, the world views of avid chess players become apparent. Visual ethnographic methods, including the use of photographs in the interview process and in participant-observation highlight the practices, values, and aspirations of the Club members. The weekly meetings and frequent tournament play solidifies the transition between chess being just a game to becoming a way of life. This research examines the members' struggle to understand their position in society in terms of both their own self-identities and the external views of them. They have to deal with social stigmas and issues facing chess players today such as the absence of women in the game. Nevertheless, the Twin City Chess Players passionately share their vast knowledge of the game in the form of easily understandable tactical strategy to each other and anyone else willing to learn.

Poster Presentation P54

**HOW STORIES SHAPE LIVES AND BUILD FRIENDSHIPS: A STUDY OF PARENTS  
WITH CHILDREN ON THE AUTISM SPECTRUM**

Bobby Tazioli and Rebecca Gearhart\*

Sociology and Anthropology Department, Illinois Wesleyan University

Over the course of the last month, I have interviewed, taken pictures of, and built relationships with parents of children on the Autism spectrum. My work here is, in one sense, a collection of stories and experiences about their lives. As an anthropologist, I am partially indebted to Clifford Geertz who stressed the importance of "thick," local understandings of culture. But in another sense, I believe that the particulars of culture are best understood and transmitted to others with reference to the general. In this way, my work has evolved into a multi-layered approach that builds on a theoretical framework for the understanding of "stories" and their significance across cultures. As recent studies in psychology suggest, the stories and narratives that come to shape an individual's memories are malleable and can be remade to meet one's needs for group identification. I will argue, with reference to my own collected observations, that there is an added dimension to the group I studied that differentiates them from this line of research. While the related stories involved in raising a child on the Autism spectrum are what bring these parents together, it is through honesty, not adaptation, that they express their values and maintain their friendships.

Poster Presentation P55

**BARRIERS TO ACCESSING THE U.S. HEALTH CARE SYSTEM FOR HISPANICS**

Patricia Troxell and Carolyn Nadeau\*

Hispanic Studies Department, Illinois Wesleyan University

Despite the efforts of past health care reform measures in the United States, which have sought to provide insurance coverage for a greater number of residents, across socioeconomic, age, and educational demographics, Hispanics are consistently more likely to be uninsured and to be in fair to poor health by comparison to other racial and ethnic groups. This presentation will discuss the disparities Hispanics face in accessing the U.S. health care system, explain the methods by which disparities in access are measured, describe the consequences of this trend, and propose reasons for the inequalities observed. Additionally, information will be available regarding the manner in which the U.S. Senate Health Care Reform Bill will affect the Hispanic community. As health care costs continue to rise and as the composition of the U.S. population changes it will become increasingly important to understand and respond to barriers which limit access to the health care system not only for the wellbeing of individuals but for the wellbeing of the community as a whole. Esta presentación también será en español.

Poster Presentation P56

**DO HIGH GAS PRICES SELL SMALLER CARS? AN EMPIRICAL STUDY OF THE  
IMPACT OF FUEL PRICES ON AUTOMOTIVE SALES**

Nathan Wheatley and Robert Leekley\*  
Economics Department, Illinois Wesleyan University

Some have suggested artificially raising the price of gasoline in the United States would create a demand for more fuel-efficient vehicles. From 2005 to 2009, average U.S. gas prices swung from a low of \$1.59/gallon to \$4.05/gallon (with many areas seeing prices shoot higher still). If higher fuel prices led to changes in consumer preferences in the market for automobiles, this should be readily apparent in vehicle sales figures. This paper attempts to explain vehicle sales through nominal fuel prices, and finds that the sale of small cars responds well to changes in these fuel prices. However, sales of larger cars and light trucks are not responsive to changes in nominal fuel prices.

Poster Presentation P57

**ULYSSES: THE HUMAN BODYSSSEY**

Travis Williams and Daniel Terkla\* and Kathleen O’Gorman\*  
English Department, Illinois Wesleyan University

“Among other things my book is the epic of the human body.” –James Joyce

*Ulysses* by James Joyce is a paragon of modernist literature. Taking place over the course of a single day, June 16, 1904, Joyce allegorically retells Homer’s *The Odyssey* for the modern age. In a chart published in Stuart Gilbert’s *James Joyce’s Ulysses: a Study*, each of the eighteen episodes of *Ulysses* are shown to correspond to an episode or character of *The Odyssey* and, with the exception of three episodes, to a specific organ of the human body. Using this systematic diagram as my guide, I have reconstructed Joyce’s *Ulysses* in the form of a life-size drawing of the human body, illustrating each organ using only words from the corresponding episodes of the novel. By pictorially situating *Ulysses* in this bodily context, I have at once represented and re-presented the themes and ideas explored in this seminal work of fiction. Because of these characteristics, my work is also presently acting as my final study in word-and-image theory, as it is a model hybrid of the two art forms.

Poster Presentation P58

**A REEVALUATION OF CAPALDI AND MILLER'S "COUNTING IN RATS:  
ITS FUNCTIONAL SIGNIFICANCE AND THE INDEPENDENT COGNITIVE  
PROCESSES THAT CONSTITUTE IT"**

Malory Wodka and James Dougan\*  
Psychology Department, Illinois Wesleyan University

In 1988, Capaldi and Miller ran a series of runway experiments investigating how rats count reinforcing events by using two randomly alternating sequences of trials in which a rat can potentially predict that a nonreinforced trial will always follow after two consecutive reinforced trials. Capaldi measured the time a rat took to reach the goal box of the runway to determine whether the rat expected to be reinforced upon reaching the goal box. The present study attempts to replicate, and hopefully improve upon, Capaldi and Miller's first of seven sub-experiments within their study. To eliminate potential error caused by differences in handling the rats prior to reinforced trials compared to nonreinforced trials, the present study utilized a closed circuit runway in which rats are not handled between trials. Furthermore, to make the previous study's results clearer, the original runway design was adapted to a y-maze which provided a greater potential number of reinforcers to be delivered per sequence of trials.

Poster Presentation P59

**IMAGING THE TOPOGRAPHY AND MONITORING THE ELECTROCHEMICAL  
ACTIVITY OF BIOLOGICAL SAMPLES**

Erica Woodall<sup>1</sup>, Emma DeWalt<sup>2</sup> and Melinda Baur<sup>1\*</sup>

<sup>1</sup>Chemistry Department, Illinois Wesleyan University

<sup>2</sup>Chemistry Department, Illinois State University

Scanning Electrochemical Microscopy (SECM) is a useful tool for the analysis of biological samples because the ultramicroelectrode tip of the probe can detect the presence of electrochemically active compounds such as neurotransmitters, particularly dopamine and norepinephrine, while simultaneously characterizing the topography of the cell. For this project, the topography of the cell was determined by maintaining a constant distance between the tip of the electrode and the surface of the cell. This distance was kept constant by measuring the impedance between the electrode tip and the reference electrode. By setting the potential of the SECM electrode to collector mode, neurotransmitter release was monitored by observing the changes in current at the tip of the electrode. A spike in current indicated the release of neurotransmitters from the cell surface. The goal of the project is to develop the SECM as a tool to study the biological effects of oxidative damage on rat pheochromocytoma cells (PC12 cells). The ultramicroelectrode probe can be used to generate the reactive oxygen species and subsequently monitor topographical changes to these cells as well as electrochemical changes on the surface of the cells.

**EDUCATIONAL STUDIES POSTERS - ES**

**9:00 – 10:00 a.m.**

Lower Level – Ames Library



Poster Presentation ES

**REAL LIFE CONNECTIONS: INTEGRATING SOCIAL JUSTICE INTO THE  
ELEMENTARY MATHEMATICS CLASSROOM**

Caitlin Barnes and Robin Leavitt\*

Educational Studies Department, Illinois Wesleyan University

For this inquiry, I integrated social justice issues into the mathematics curriculum in a fourth grade classroom. My inquiry questions are: In what ways do children understand real life connections between math and social issues? How can I create meaningful learning experiences about specific social issues using mathematics? To answer these questions, I created lessons and held class discussions about three different social justice issues relevant to students' lives: money, equality, and sweatshops. The data I collected included student work, my own written reflections on lessons I taught, and field notes of child observations. Preliminary findings indicate that students understand real life connections between math and social issues. I also found that the students had a better understanding of the mathematics concepts from the inclusion of social justice issues.

Poster Presentation ES

## **INTEGRATING COOPERATIVE LEARNING IN THE CLASSROOM**

Natalie Boesche, Chelsea Wallis, and Robin Leavitt\*  
Educational Studies Department, Illinois Wesleyan University

This inquiry is a collaborative study of the benefits of integrating cooperative learning into the classroom. Specifically, we attempt to answer the following questions: 1) How can we effectively integrate cooperative learning into the classroom? 2) In what ways will cooperative learning benefit the students in our classroom? In our inquiry, we discuss the three types of cooperative learning: partner work, group work, and whole class collaboration, which we implemented in the classroom. We used lesson plans, field notes, reflections, photographs, student work, and literature to support our inquiry. We analyzed our data to determine the benefits as well as limitations of using cooperative learning in the classroom. We address how this inquiry has influenced our teaching philosophies and how it will impact our future classroom practices.

Poster Presentation ES

**ADOLESCENT ATTITUDES TOWARD LITERATURE**

Anne Marie Casa and Robin Leavitt\*

Educational Studies Department, Illinois Wesleyan University

The purpose of this study was to gather information about what adolescent students like to read and why. Participants included grade nine students enrolled in a Literature and Composition course. Data collected included reading logs written by the students, notes about class discussions, and recorded conversations with students about reading and reading material. The results revealed students' interests regarding the books that they enjoy reading. Findings also revealed how students related to and understood texts required by the school. While most students enjoyed reading a book of their own choice, they indicated that they struggled with and did not particularly enjoy school required texts. This data will inform the selection of literature I will undertake in the future in order to promote enjoyment of and connections with required and elective readings.

Poster Presentation ES

## **EFFECTIVE METHODS FOR TEACHING VOCABULARY IN GEOMETRY**

Christy Engel and Leah Nillas\*

Educational Studies Department, Illinois Wesleyan University

Mathematics is sometimes thought as a language due to the large amount of vocabulary involved in learning this subject. An important element of understanding a language is the comprehension of the vocabulary words and the ability to use them in context. Prior research found that teaching methods which required a deeper level of processing and understanding led to better retention than methods that required basic comprehension (Sagarra, 2006). My self-study focuses on the effects of the use of different instructional methods in teaching mathematics vocabulary on students' understanding of geometry definitions and their meanings. I conducted the study in a high school geometry classroom wherein I implemented and analyzed five different instructional methods (i.e., playing charades, making connections to real life examples, connecting English and symbolic definitions, using if-then definitions and studying the different parts of the words) used to teach math vocabulary. I analyzed data from assessments, student reflections, and my own journal reflections to determine the effectiveness of these lessons. Since vocabulary is an integral part of a geometry classroom, the ability to understand math vocabulary is vital for students' understanding of concepts and skills. This study gives better insight into what I can do as a teacher to promote better understanding of concepts in geometry.

Poster Presentation ES

**BEYOND DIBELS: ADDING COMPREHENSION QUESTIONS TO  
A FLUENCY BASED READING TEST**

Cathy Gembara and Leah Nillas\*

Education Studies Department, Illinois Wesleyan University

*DIBELS* test is a widely used reading assessment in the elementary grades to determine students' reading ability; however, it does not include a reading comprehension component. According to Baumann, Hooten, and White (1999), students have a greater understanding of what they read when reading comprehension components are added to reading instruction. My goal for this research was to supplement DIBELS test, which solely measures fluency, by adding comprehension questions to assess students' reading ability. DIBELS test is used to determine the level of additional reading support each student needs. However, the test results do not give information on the type of support needed by students based on their DIBELS score. I added reading comprehension questions to the supplemental instructional tool, *Six Minute Solutions*, which has an identical setup to the DIBELS test. I analyzed the different types of comprehension questions used to determine the reading strengths and weaknesses of my fourth grade students. I found that comprehension questions provided a better insight about the reading skills of students who needed additional instruction. DIBELS scores were not sufficient tools in determining reading ability and identifying instructional support in developing students' reading comprehension.

Poster Presentation ES

**SUPPORTING STUDENT'S SUCCESS IN READING**

Emily Haager and Robin Leavitt\*

Educational Studies Department, Illinois Wesleyan University

This inquiry follows my growth as a teacher and my students' growth as readers and learners. I tell this story as I strive to answer the question, "How can I best support students' success in reading while motivating them to take responsibility for completing their school work?" Through reflection and collection of student work, lesson plans, and video, I examine how my practices as a teacher, the choice of text, and students' needs affect students' success and motivation. My examination of this material has led me to a more holistic view of reading instruction and will inform my future practices as a teacher.

Poster Presentation ES

**FACILITATING STUDENTS' MATH UNDERSTANDING THROUGH  
SMALL GROUP WORK**

Ellen Ho and Leah Nillas\*

Educational Studies Department, Illinois Wesleyan University

Effective implementation of collaborative small group work in the high school classroom has the potential to enhance learning and understanding for all students (Webb, et al., 2009). My self-study focuses on how small group work can be implemented in a classroom so that all students are working together productively to understand math. During the fall of 2009, I developed and taught geometry lessons involving research-based group activities to approximately 70 students in a diverse high school in Central Illinois. I video-recorded and analyzed student interactions during small group activities. I documented my teaching experience and analyzed student responses on questions pertaining to what they perceived as the benefits and disadvantages of small group work. Results indicated that students engaged constructively with each other the most when the activity was meaningful and when I acted as a facilitator of their discussions. However, small group work should not be the sole method of instruction in a classroom, as it does not cater to all learning preferences. This study contributes to the growing amount of research regarding how collaborative small group work supports student success in diverse classroom settings.

Poster Presentation ES

**RESPONDING TO THE CHALLENGES OF TEACHING  
HIGH SCHOOL JOURNALISM**

Emily Houk and Robin Leavitt\*

Educational Studies Department, Illinois Wesleyan University

In this inquiry, I address the challenges of teaching high school journalism classes in which the students vary in prior knowledge of and experience with journalism, as well as in age and academic ability. The heterogeneity of the students and the variety of tasks that are involved in publication create an environment that poses certain challenges for the teacher/adviser in terms of effectively individualizing instruction with the common class goal of producing the newspaper. During student teaching, I implemented and examined different pedagogical strategies in exploring how to help students meet learning goals specific to each level of the course. Through analysis of my written reflections on student participation and learning, along with student feedback, I have reached conclusions as to which strategies are most effective in the journalism classroom. I have also gained insight as to what journalism students find meaningful about their learning in the class.



Poster Presentation ES

**THE IMPLICATIONS OF MOTIVATION IN THE  
HIGH SCHOOL SPANISH CLASSROOM**

Gina Manson and Leah Nillas\*

Educational Studies Department, Illinois Wesleyan University

The motivation, or driving force, for which a student studies Spanish may vary greatly within high school Spanish students. Just as Dornyei (2003) investigated how to initially motivate students, and then how to maintain student motivation for learning a foreign language, I studied how I could help motivate intrinsically unmotivated students. The purpose of this research is to identify students' various motivations for learning Spanish and the implications of these motivations on their learning and performance.

This research was conducted in a Spanish 4 classroom setting in a local high school. Using a survey, I asked student participants to reflect upon their motivations and attitudes toward learning Spanish. I analyzed this data, along with my observation notes and reflections on lessons I conducted, with the purpose of identifying and assessing student motivation. I found that students are both instrumentally and intrinsically motivated to learn, and as a teacher, I have an important role in keeping them motivated.

Poster Presentation ES

**METHODS TO ENGAGE STUDENTS IN THEIR MATHEMATICAL  
LEARNING EXPERIENCE**

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In 2005 Park studied the effects of different classroom variables and engagement on students' achievement. He found that there was a positive correlation between student engagement and student achievement. We conducted our self study research in Geometry and Pre-Calculus classes with the goal of answering the question: *what teaching methods can we use to engage students and facilitate their learning of mathematical concepts?* Our study required planning lessons that elicited student engagement and then evaluating the effectiveness of these lessons. This process included reflecting, learning, and extending our knowledge to make decisions about our future practice. We found the most successful activities were goal oriented: students performed immediately to answer specific questions. Another characteristic of engaging lessons was when students took leading roles in the lesson while we acted as facilitators. As this research focused on students' short-term retention of concepts, an interesting extension could evaluate the effect engaging lessons had on long-term retention of mathematical concepts.

Poster Presentation ES

**SUPPORTING NATIVE LANGUAGE LITERACY AND CULTURE AMONG  
HISPANIC HIGH SCHOOL STUDENTS**

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The “English Only” sentiment of the recent past has had traumatic effects on the native language abilities of many Hispanic students in the American schooling system. While their English comprehension continues improving, their Spanish comprehension continuously declines and leaves them unable to access a huge part of their identity (Potowski, et al., 2009).

I noticed this issue while teaching Spanish for Native Speakers (SNS) courses at an urban high school during the fall of 2009, which motivated me to engage in a self-study. This study was designed to implement various strategies, which worked with native language speakers’ unique needs and background knowledge, with specific implications for literacy enhancement and cultural enrichment. In analyzing the results of these strategies and my own journal entries, advancements in both native language ability and a broader cultural understanding were noted. These results contain important clues into offering Hispanic high school students a curriculum that works specifically with their needs to help them become bilingual and culturally aware adults.

Poster Presentation ES

## **ROLE OF DRILLS IN THE LEARNING OF MATHEMATICAL CONCEPTS**

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The use of math drills is effective in the teaching of mathematical skills (Baroody, Bajwa, & Eiland, 2009; Burns, 2005; Cates, 2005; Gallagher, 2006; Hopkins & Egeberg, 2009; Kumar, 1971; McKenna, Hollingsworth, & Barnes, 2005; Toppino, Cohen, Davis, & Moors, 2009; Woodward, 2006). However, as Gallagher (2006) stated, “the perceived incompatibility with discovery learning, its mechanical features and making children like automatons” resulted in the use of drilling to be tossed aside in favor of more problem-based learning or the use of manipulatives in instruction. The purpose of this study is to see how math drills can be integrated into a classroom to aid in the learning of mathematical concepts while reinforcing the basic skills needed to succeed in mathematics. I administered several math drills throughout a semester. I collected data on scores students received on various math drills and from a game about fractions. I also document my experience through journal reflection. I found that drilling can be used a supplementary instructional tool that can advance both the learning of math concepts and skills.

Poster Presentation ES

**THE IMPACT OF AFTERSCHOOL PROGRAMS IN LOW-INCOME COMMUNITIES**

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“Children who are unsupervised after school are not only in danger of becoming victims of crimes or accidents; they are also at risk in other less dramatic but equally troubling ways. These 15.1 million children are at risk of falling behind academically, socially, and emotionally. They are at higher risk than other children and youth of substance abuse, gang involvement, teen pregnancy and dropping out” (America After 3pm, 2009, p. 2). The purpose of this research is to study the impacts of afterschool programs on families from low-income communities.

Children, parents and staff from five central Illinois afterschool facilities, were asked to evaluate the value of afterschool programs on their personal lives and community. Collected through interviews and letter reviews, data showed that programs offered a range of benefits to the lives of families who utilized the facilities. Data also showed that facilities are facing major budget cuts, resulting in fewer families having access to the services they currently rely on. Literature reviews and personal data collection established the vital need of afterschool programs, and the need to keep as many programs open in low-income communities.

Poster Presentation ES

**AIDING STUDENTS UNDERSTANDING OF HISTORY THROUGH  
A THEMATIC APPROACH**

Brian Schaeffer and Leah Nillas\*

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The chronological teaching of history is historically the dominant form of history instruction in the United States. However, the inquiry into teaching history through the thematic approach has recently come to the forefront. Themes or patterns that are used to teach history act as the vehicle for organization that students use to understand historical concepts (Davies, 2001).

The purpose of this study is to understand the effectiveness of teaching history thematically. I conducted my research in a freshman level high school classroom of twenty-seven students. I taught lessons using specific themes such as: breakout of war for the reasons of World War 1, culture/school of thought for Confucianism and other religions in China, cycle of rule for the Dynastic Cycle in China, reform/mistakes for the emergence of communism in China, and rejection for present day China. I documented my teaching experience through journals and reflections, solicited students' responses through after lesson exit slips, and analyzed recordings of my teaching. My goal was to understand how the use of themes helped students learn historical events and concepts. Future history teachers can learn from my experience in using common themes in teaching history.

Poster Presentation ES

**THE ART OF INTEGRATING THE ARTS: AN EXAMINATION OF INTEGRATING  
THE FINE ARTS INTO READING AND WRITING INSTRUCTION**

Christine Szukalla and Robin Leaavitt\*  
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This inquiry was motivated by my student teaching experiences during which I integrated the arts into the curriculum on a daily basis. The following questions were explored: 1) What does art integration look like in a third grade classroom? 2) How can I incorporate the arts into the teaching of all curricular areas? 3) How can the arts be used to promote literacy in the classroom? I adopted a self-study model of inquiry, supplemented by lesson plans, student work, video tapes of my lessons, and field notes. My self-study involved developing and teaching a series of lessons focused on art integration. Through my study I concluded that the most effective way to use art integration is through a co-equal cognitive integration approach whereby students actively engage in the arts to deepen their understanding of the curriculum.

Poster Presentation ES

**IMPROVING WRITING SKILLS OF LOW-INCOME  
HIGH SCHOOL STUDENTS**

Andrew Tobin and Leah Nillas\*

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Students from low-income households are often the most at risk for failing or dropping out of high school and many of those students come from minority households (Johannessen, 2004). For example, the dropout rate in 2007 among Hispanic students was nearly three times the national average (National Center for Educational Statistics, 2007). The purpose of this study was to determine the effectiveness of strategies I used in writing instruction for students from low-income households. I conducted this self study research in a class of 30 high-school seniors in a racially and economically diverse school in Central Illinois. Through the use of technology, allowing students autonomy in designing their projects, and providing opportunities for peer review, I aimed to improve the writing skills of my students. Initial data analysis showed that these strategies were effective in increasing student engagement in their writing and had a positive effect on their formal writing skills. The results of this study suggest that all teachers working with underprivileged students should allow student autonomy, create a positive classroom community, and connect learning with student's lives outside of the classroom.



Poster Presentation ES

## **MOTIVATING EFFECTIVE REVISION THROUGH TEACHER FEEDBACK**

Katie Utesch and Robin Leavitt\*

Educational Studies Department, Illinois Wesleyan University

This is a study the effectiveness of teacher feedback throughout the writing process and its ability to stimulate student revision. My inquiry focuses on the following questions:

1. What types of written comments result in the most effective revision?
2. Do instructional strategies such as multiple drafting and individual conferencing increase effective revision?

I examine ten students' writing folders, coding my feedback into five categories and assessing whether or not students made revisions based on comments. After looking at the percent of change for each category and overall, I then consider whether the revision was positive to determine what types of comments result in the most effective revision. Additionally, I compare the results of students who completed multiple drafts and/or individual conferencing to evaluate the effect of these instructional strategies on revision. Finally, I reflect on the limitations of my study and how these conclusions will influence my future teaching practices.

Poster Presentation ES

**EFFECTIVE QUESTIONING TECHNIQUES IN THE  
MATHEMATICS CLASSROOM**

Amy VanDerVoorn and Leah Nillas\*

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Teachers pose a variety of questions to their students every day. As teachers, we recognize that some questions promote deeper mathematical thinking than others (Herbal-Eisenmann & Breyfogle, 2005). My goal for this self-study was to develop my own questioning skills to promote deeper mathematical thinking as well as elicit classroom discussion with qualitative student responses. I conducted the research in a high school geometry class of thirty students. I found that discussion for qualitative responses is not typical in a mathematics classroom, and it is difficult to initiate, facilitate, and establish a classroom norm where students engage in qualitative discussion about mathematics. However, I did learn effective questioning techniques in order to engage them in active learning. These techniques are beneficial for all mathematics teachers to promote discussion and active learning.

Poster Presentation ES

**THE IMPACTS OF INTEGRATED TEACHING IN  
THE ELEMENTARY CLASSROOM**

Carrie Williams and Leah Nillas\*

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“The world in which our students live, and the one which they will inherit, is integrated and cross-disciplinary. In schools, we break the world down into fragments, but the preference is to consider phenomena coherently—to identify the pattern and structure with context as a clue.” (Jones and Thomas, 2006, p. 64). Due to the current trends of standardized testing, non-testable subjects such as art and social studies have taken a backseat in the elementary classroom. The purpose of this research is to attempt to overcome these pressures through the approach of integrated, or multi-subject, teaching. My research was conducted in two separate classrooms, kindergarten and the fourth grade. Through teaching multiple lessons students were exposed to an integrated approach to learning. These lessons centered on pulling elements of core subjects such as math and language arts into lessons focused on non-testable areas like art and social studies. By doing this I hoped to give merit to these subjects while building connections between the different areas of academia as well as the real world.

Poster Presentation ES

**LET'S TALK PHYSICS: UTILIZING LANGUAGE TO IMPROVE UNDERSTANDING**

Bobby Zoeller and Leah Nillas\*

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Einstein once stated that “If you can't explain it simply, you don't understand it well enough.” This idea can be useful in the context of a physics classroom where students often struggle with conceptual and mathematical understanding. The purpose of this study is to analyze strategies to improve student comprehension using language based instruction and assessment techniques. This research was conducted in a public high school physics classroom consisting primarily of junior and senior level students. Students were provided with instruction that focused on discussion and conceptual understanding before any introduction to formulae. Furthermore, students were also asked to construct their own definitions of concepts during class and on assignments. Data showed that students who developed a linguistic explanation of concepts demonstrated a higher level of understanding. This result was also reflected in students' homework, assessment, and participation in general discussion of physics concepts.

Poster Presentation ES

## **WAYS TO INTEGRATE SCIENCE INTO THE LANGUAGE ARTS CURRICULUM**

Jenny Zyks and Robin Leavitt\*

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In this inquiry I sought to answer the question: How can I effectively integrate science into the language arts curriculum? I planned and implemented lessons that combined science, reading and writing while student teaching in a second grade classroom. I combined all three of those subjects through a variety of different activities and lessons. Data collection included lesson plans, writing activities that I created, and written reflections on the effectiveness of the lessons. In this final report, I analyze the extent to which the integrated instruction I implemented was effective, and the significant factors contributing to more or less effective integrated learning experiences in science and language arts. I conclude with some reflections for future practice.



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