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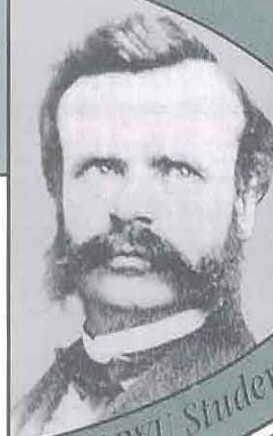
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THE SEVENTEENTH ANNUAL

Illinois Wesleyan University
John Wesley Powell

2006

STUDENT
RESEARCH CONFERENCE



To Recognize the Research Projects & Creative Endeavors of IWU Students

CENTER FOR
NATURAL SCIENCES
SATURDAY
APRIL 8, 2006

<http://www2.iwu.edu/jwprc>



Illinois Wesleyan
UNIVERSITY

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.

Seventeenth Annual

John Wesley Powell • IWU

Student Research Conference

Science Commons

Center for Natural Sciences

Saturday, April 8, 2006

8:30 a.m. – 6:00 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 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 and Curtis Kelch of Information Technology in setting up computer equipment in all rooms and constructing and updating the conference website is greatly appreciated.

John Wesley Powell Research Conference Committee:

- Stephanie Davis-Kahl (The Ames Library)
- Linda French (Physics)
- Mike Seeborg (Economics)
- Mike Theune (English)

SCHEDULE OF EVENTS

Saturday, April 8, 2006

8:30 a.m.	Continental Breakfast and Poster Setup	Science Commons
9:00 a.m.	Poster Session A	Science Commons
10:00 a.m.	Oral Presentations – <i>Session One</i> Sessions 1 through 7	CNS
11:00 a.m.	Oral Presentations – <i>Session Two</i> Sessions 8 through 14	CNS
12:15 p.m.	Luncheon	Main Lounge
1:15 p.m.	Keynote Address: Dr. Robert J. Sternberg	Anderson Auditorium (C101)
2:35 p.m.	Poster Session B	Science Commons
4:00 p.m.	Senior Art Show and Critique	Merwin and Wakeley Galleries
5:15 p.m.	Performances of Music Student Compositions	Westbrook Auditorium

KEYNOTE SPEAKER

"TEACHING PSYCHOLOGY FOR SUCCESSFUL INTELLIGENCE"

Dr. Robert J. Sternberg, Dean of the School of Arts and Sciences
Tufts University, Boston, MA

1:15 p.m. Anderson Auditorium (C101)

Dr. Robert J. Sternberg is Dean of the School of Arts and Sciences at Tufts University. As such, Dean Sternberg oversees undergraduate and graduate education in 23 departments, more than 10 interdisciplinary programs and 20 masters and Ph.D. programs. He also oversees admissions, student services, student life, athletics and development, and works to ensure excellence in research, scholarship, teaching and the intellectual partnership between faculty and students.

Dean Sternberg is Professor of Psychology and Director of the PACE (Psychology of Abilities, Competencies and Expertise) Center. His work at the PACE Center is dedicated to the advancement of theory, research, practice and policy advancing the notion of intelligence as modifiable and capable of development throughout the life span. Previously, Dean Sternberg was IBM Professor of Psychology and Education and Professor of Management at Yale University.

Dean Sternberg received his Ph.D. from Stanford University and his B.A. summa cum laude and *Phi Beta Kappa*, with honors with exceptional distinction in psychology, from Yale University. He also has received 5 honorary doctorates. Dean Sternberg is a past-president of the American Psychological Association.

A member of the American Academy of Arts and Sciences, Dean Sternberg's research covers a wide range of areas, including intelligence, creativity, wisdom, leadership, love and close relationships, and hate. He is the author of over 1000 books and articles, and has won roughly two dozen awards for his scholarship. His research has taken him to five different continents, where he has studied the relationship between culture and competence.

STUDENT PARTICIPANTS

Oral and Poster Presentations

Alena Abens	P1	Melissa Giegerich	O7.1
Matt Anderson	P2	Susan C. Grana	P26
Aaron Bailey	P3	Adam M. Gray	O5.1
Melissa M. Balek	P5	Megan D. Guse	P27
Kyle Barkmeier	O13.1	Sherri Haas	O10.3
Eric Barnes	P4	Daniel Haeger	P28
Maura Bates	P7	Rebecca Hahn	O7.2
Patrick Beary	O4.2	Stephanie Hajdu	P29
Elizabeth Beggs	P6	Kevin Hartleben	P30
Brandy Blackwell	P2	Chris Hatfield	P31
Emma Bland	P8	John Haugen	O5.3
Jon Blome	P9	Lindsay Hawley	O8.2
Deborah Boersma	P11	Andy Heikes	O6.3
Karen Boschen	P10	Ashley Higginson	P33
Craig Brauer	P12	Nicholas Holland	O5.2
Kelly Brinker	O13.3	Melissa Holmes	P32
Amy Brinkman	P13	Stacy Hynes	P34
Leslie Brockley	P14	Adrienne Ingrum	O10.1
Bonnie Brunkalla	O12.2	Robert Inzinga	P35
Amy Cadwallader	P15	Sarah Janota	O9.1
Adam Cannon	O12.1	Keyona Jarrett	O9.2
Sarah K. Christensen	P16	Robin Johnson	P7
Ashley Christensen	O11.2	Jessica Jones	P36
Erin Cruz	O2.1	Kristina Kalous	P37
Qiana R. Cryer	O9.3	Clarissa Kastner	O12.3
Matas Cyvas	P17	Brittany Kirkpatrick	O10.2
Jennifer C. Dawson	O6.1	Amy Kowalski	P38
Jeffrey W. Donelan	P18	Catherine Krahe	P39
Crystal Dye	P19	Heather Kwoka	P40
Emily Eickhorst	P20	John Lattyak	P41
Justin Ernat	P3	Katherine Lee	P42
Reve Fisher	P22	Kristy Lehan	P43
Bryan Foley	O2.3	Rachael Liesman	O3.3, P44
Kathleen Frawley	P21	Kelly Lingen	P45
Michael Gabriele	P23	Sara Lockman	P46
Tyler Garofalo	P24	Jessica Lothman	O11.1
Daniel H. Garrette	O13.2	Michael Mastro	P47
Rebecca Gericke	P25	Leah Maurer	P48

Continued.....

STUDENT PARTICIPANTS
Oral and Poster Presentations

Melissa McCandless	P50	Scott Simons	P71
Megan McCarthy	O11.3, P52	Ryan Smith	P72
Kate McCulloch	P49	Amanda Solliday	P48
Meghan E. McGrady	P54	Bailee Soltys	O1.2
Molly M. McLay	O1.1	Melinda Sprague	P33
Kristine Miller	P56	Brett A. Strand	P73
Adam Miller	P51	Lauren Suchomski	O2.2, O11.2
Ryan Misek	P34	Rebecca Sutton	P65
Megan Mondi	O8.1	Jane Szafraniec	P1
Khalilah Muhammad	P53	Megan Teschner	P43
Sean Mullins	O3.2, P56	Thomas Traynor	P17
Cristina Muniz	P58	Erin Triplett	P74
Katie Navin	P55	Adam F. Turk	O6.2
Jaclyn Nesbitt	P35	Bridget Wall	P75
Mai Nguyen	P57	Emma Wear	P2
Nurman Noor	P59	Katie Wesolik	P55
Bridget O'Connor	O8.3	Dane White	P76
Debo Olaosebikan	O14.1	Ashley Whittington	P78
Stephanie Olsen	P29	Matt Wilhelm	P28
Sarah Osborn	P60	Elizabeth H. Williams	P77
Chrissy Paarlberg	O4.3	Jason Williams	P79
Caroline Page	O7.3	Melanie Winslow	P80
Natalie Pawluk	P61		
Karen Petersen	P62		
James Planey	P10		
Jill Raabe	P2		
Korey Reynolds	P63		
Erie M. Roberts	O1.3		
Monica Rose	P64		
Michelle Ryndak	P33		
Ashley L. Samsa	P65		
Kristina Sawyer	P66		
Lindsay Schelling	P48		
Kyle Schnitzenbaumer	P67		
Sarah Schwartz	P68		
Kristin Serna	O4.1		
Sheila Setork	P69		
Lindsay Sicks	O3.1, P70		

**BFA SENIOR CRITIQUE HONORS
SCHOOL OF ART
Saturday, April 8, 2006, 4:00 p.m., Merwin and Wakeley Galleries**

Student Presenters:

Lindsay Budzynski

Kristen A. Carlson

Laurie Couch

Melinda Flinchum

Meghan McCreary

Alex H. Mitchell

Jeffrey Scott

Daniel Wood

Refreshments will be served

MUSIC COMPOSITION STUDENT PRESENTATIONS

Saturday, April 8, 5:15 p.m., Westbrook Auditorium

Pacific

Luke Gullickson '07

Solo Piano

Erin Crabb, Orchestra Reduction

What a Beast Art Thou!: Three Shakespeare Songs

Eric Malmquist '07

"Hark villains! I will grind your bones to dust..."

"A beastly ambition..."

"Even now I curse the day..."

William Roberts III, bass

Erin Crabb, piano

Choral Composition

Paul Teipe '07

Music Presentation

PACIFIC

Luke Gullickson and David Vayo*
School of Music, Illinois Wesleyan University

Pacific, my composition for solo piano with orchestra, was composed during the summer of 2005. It is built in three main sections, which represent different parts of the country that one experiences in a trip from the Midwest to the Pacific Ocean. The first section, the Prairie, starts with the piano entrance. The second, the Mountains, starts with the reentrance of the orchestra after the long piano solo, halfway through the piece. The third and shortest, the Ocean, enters near the end of the piece, and is represented by a quotation from Chopin's "Ocean" Etude. Each of the main sections is characterized by a main theme, and these and other secondary themes enter, exit and reappear throughout the piece to give the feeling of a journey where some experiences are vaguely familiar and others completely new. For the John Wesley Powell Conference, I will present the two-piano version of the work, in which one pianist plays the solo piano part and another plays a reduced version of the orchestra's part

Music Presentation

PACIFIC

Luke Gullickson and David Vayo*
School of Music, Illinois Wesleyan University

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Music Presentation

WHAT A BEAST ART THOU! - THREE SHAKESPEARE SONGS

Eric Malmquist and David Vayo*
School of Music, Illinois Wesleyan University

"What a beast art thou! - Three Shakespeare Songs" was commissioned by William Roberts III, currently a senior vocal performance major at Illinois Wesleyan University. His idea was to set violent or otherwise abhorrent Shakespeare texts to music for his performance. The three texts selected are from "Titus Andronicus" and "Timon of Athens." My goal with these songs is two-fold. First, expression of the meaning of the texts, with special care given to the context of the scene, is most important. Second, the pieces showcase the stage presence and talent of the performer, Mr. Roberts. The music intends to highlight the dark and grotesque aspects of humanity using tension between dissonance and consonance, black humor, drama, and the performing skills of William Roberts III.

Music Presentation

CHORAL COMPOSITION

Paul Teipe and David Vayo*
School of Music, Illinois Wesleyan University

This piece focuses on contemporary choral composition with a concentration in traditional religious roots of the Orthodox Church. The piece was inspired by a choir tour trip to Russia my freshman year and focuses primarily on the Orthodox chant of 'Gospodi pomilui' which is the Eastern parallel to the Western 'Kyrie eleison' (Lord, have mercy). The music itself focuses around three sections (ABA form) and contains mainly unresolved cadences to display an emotion of uncertainty and a loss of faith.

ORAL PRESENTATIONS - SESSION 1
10:00 – 11:00
CENTER FOR NATURAL SCIENCES (E108)
MODERATOR: MEGAN MONDI

- 1.1 Molly McLay
English and Women's Studies
- 1.2 Bailee Soltys
English
- 1.3 Erie Roberts
History

ORAL PRESENTATIONS - SESSION 2
10:00 – 11:00
CENTER FOR NATURAL SCIENCES (E101)
MODERATOR: ELIZABETH TAYLOR

- 2.1 Erin Cruz
Hispanic Studies
- 2.2 Lauren Suchomski
Hispanic Studies
- 2.3 Bryan Foley
Hispanic Studies

ORAL PRESENTATIONS - SESSION 3
10:00 – 11:00
CENTER FOR NATURAL SCIENCES (C101)
MODERATOR: MAI NGUYEN

- 3.1 Lindsay Sicks
Biology
- 3.2 Sean Mullins
Biology
- 3.3 Rachael Liesman
Biology

ORAL PRESENTATIONS - SESSION 4

10:00 – 11:00

CENTER FOR NATURAL SCIENCES (E102)

MODERATOR: GBADEBOWALE OLAOSEBIKAN

- 4.1 Kristin Serna
International Studies
- 4.2 Patrick Beary
International Studies
- 4.3 Chrissy Paarlberg
International Studies

ORAL PRESENTATIONS - SESSION 5

10:00 – 11:00

CENTER FOR NATURAL SCIENCES (C102)

MODERATOR: MIKE FEENEY

- 5.1 Adam Gray
Economics
- 5.2 Nicholas Holland
Economics
- 5.3 John Haugen
Economics

ORAL PRESENTATIONS - SESSION 6

10:00 – 11:00

CENTER FOR NATURAL SCIENCES (E105)

MODERATOR: AZIZUDDIN ROSE

- 6.1 Jennifer Dawson
Economics
- 6.2 Adam Turk
Economics
- 6.3 Andy Heikes
Risk Management

ORAL PRESENTATIONS - SESSION 7

10:00 – 11:00

CENTER FOR NATURAL SCIENCES (E103)

MODERATOR: LAUREN GIANNINI

- 7.1 Melissa Giegerich
 Nursing
- 7.2 Rebecca Hahn
 Nursing
- 7.3 Caroline Page
 Psychology

ORAL PRESENTATIONS - SESSION 8

11:00 – 12:00 noon

CENTER FOR NATURAL SCIENCES (E108)

MODERATOR: MOLLY MCLAY

- 8.1 Megan Mondi
 History
- 8.2 Lindsay Hawley
 History
- 8.3 Bridget O'Connor
 English

ORAL PRESENTATIONS - SESSION 9

11:00 – 12:00 noon

CENTER FOR NATURAL SCIENCES (E103)

MODERATOR: LINDSAY SICKS

- 9.1 Sarah Janota
 Psychology
- 9.2 Keyona Jarrett
 Psychology
- 9.3 Qiana Cryer
 Psychology

ORAL PRESENTATIONS - SESSION 10
11:00 – 12:00 noon
CENTER FOR NATURAL SCIENCES (E105)
MODERATOR: LESLIE FREEHILL

- 10.1 Adrienne Ingrum
Economics
- 10.2 Brittany Kirkpatrick
Economics
- 10.3 Sherri Haas
Economics

ORAL PRESENTATIONS - SESSION 11
11:00 – 12:00 noon
CENTER FOR NATURAL SCIENCES (E101)
MODERATOR: DONNELL MCGHEE

- 11.1 Jessica Lothman
Sociology
- 11.2 Ashley Christensen and Lauren Suchomski
Educational Studies
- 11.3 Megan McCarthy
Hispanic Studies

ORAL PRESENTATIONS - SESSION 12
11:00 – 12:00 noon
CENTER FOR NATURAL SCIENCES (E102)
MODERATOR: KUNAEY GARG

- 12.1 Adam Cannon
Anthropology
- 12.2 Bonnie Brunkalla
Greek and Roman Studies
- 12.3 Clarissa Kastner
Hispanic Studies

ORAL PRESENTATIONS - SESSION 13
11:00 – 12:00 noon
CENTER FOR NATURAL SCIENCES (C101)
MODERATOR: BRET LESSARD

- 13.1 Kyle Barkmeier
 Computer Science
- 13.2 Daniel Garrette
 Computer Science
- 13.3 Kelly Brinker
 Music

ORAL PRESENTATIONS - SESSION 14
11:00 – 12:00 noon
CENTER FOR NATURAL SCIENCES (C102)
MODERATOR: JESSICA BIRO

- 14.1 Debo Olaosebikan
 Physics
- 14.2 Ryan Smith
 Physics

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

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

WRITING OUT (OF) A GENDERED LANGUAGE

Molly M. McLay and Michael Theune*
English Department, Illinois Wesleyan University

In her paper, "The Laugh of the Medusa," Hélène Cixous describes a woman's experience of speaking: "She throws her trembling body forward; she lets go of herself, she flies; all of her passes into her voice, and it's with her body that she vitally supports the logic of her speech. Her flesh speaks 'true.'" In order for women to truly inscribe themselves in language, they must use their bodies, "draw story from history." The difficulty, according to Cixous, lies in getting oneself enough outside of the patriarchal system of marked language, the system which prevents women from truly inscribing themselves in words and from finding their own sort of speech and their own sort of writing.

My project consists of two parts: a collection of experimental poems written of, about, and/or to gendered experience, and an essay that conceptualizes this work in traditions of feminist theory and poetry. Feminist literary thought, in its most complex and nuanced form, ultimately breaks open into poetry. Conducted through the English department with input from women's studies disciplines, this creative writing experiment attempts to poeticize feminism, creating poetic arguments from and for feminist ideas as well as enacting the theory into poetic language and structures. It is an exercise in writing a woman out of a binding system and into her own self, and it is inscribing her self in a language that has no linear bias, a language that can be what Cixous calls "these waves, these floods, these outbursts" not unworthy of being heard.

Oral Presentation O1.2

THE EFFECTS OF PATRONAGE AND MEDIEVAL AUDIENCES: EREC ET ENIDE AS A FEMALE WISH FULFILLMENT FANTASY

Bailee Soltys and Dan Terkla*
English Department, Illinois Wesleyan University

Chrétien de Troye's *Erec et Enide* has been controversial for centuries. Critics have long explored and debated the gender problems it raises and the question of whether it is a male or female wish fulfillment fantasy. Critics also argue over which sex Chrétien was aiming to exalt, but a female patron and a mostly female aristocratic audience seem to have forced Chrétien to focus on the desires of women. As a result, the medieval woman's marriage fantasy gets fulfilled in *Erec et Enide*.

Beginning with Urban Holmes and Douglas Kelly's ideas on patronage and audiences in the Middle Ages as well as Georges Duby's observations of love and courtship, I argue, with Keith Busby, Douglas Kelly, and L.T. Topsfield, that Enide would be quite a dynamic woman in comparison to other middle-aristocratic women of the time period. Furthermore, I argue that the qualities and situations Chrétien chose to bestow upon her are quite unattainable for his female audience, but that they would appeal to them nevertheless. I use Douglas Kelly's idea of the power of medieval patrons to show how Chrétien fit his romance to a female patron's desires, and how this affects Enide's fate. I argue, with Busby, Kelly, and Topsfield, that Enide is the true hero of the romance, and that a male medieval audience would find the heroic characteristics Chrétien bestowed upon her provocative, but that a female audience would have found them pleasing.

Oral Presentation O1.3

MOTHERHOOD, DECONSTRUCTION, AND A CRUMBLING COSMOS

Erie M. Roberts and Paul Bushnell*
History Department, Illinois Wesleyan University

In Robert H. Abzug's book *Cosmos Crumbling: American Reform and the Religious Imagination*, he argues that early American reformers, driven by their strong evangelical beliefs, were trying to create God's kingdom of heaven on earth and rebuild their shattered cosmos by reforming nearly every aspect of American society. According to Abzug, their actions and sense of reality were part of a larger cosmic meta-history indeed to bring the coming millennium. While Abzug's work focuses on the major reformers and reform movements, it overlooks and dismisses other worldviews that influenced these reformers. Specifically, he focuses on the radical women reformers and dismisses the mainstream, and as a result has an incomplete theory that does accurately account for the nuance of position and belief within early first-wave feminism. His lack of understanding is especially evident in his analysis of Catherine Beecher. Beecher, along with others, worked within this framework to advocate for a powerful, but separate, sphere of influence for women. And the revolutionary aspects of (what is considered by many scholars) a conservative movement become even more apparent by applying Derrida's theories of hierarchical pairs. Abzug's work is incomplete, and I hope to extend it, challenge it, and ultimately improve it through such an analysis of the rhetoric used by and assumptions of reformers such as Catherine Beecher, Lydia Maria Child, Lydia Huntley Sigourney, and Susan Warner.

Oral Presentation O2.1

**CORPORAL GESTURES AND COMMUNICATION STRATEGIES WITHIN
ORAL PROFICIENCY INTERVIEWS**

Erin Cruz and Christina Isabelli*

Hispanic Studies Department, Illinois Wesleyan University

This study is an extension of an investigation by Liskin-Gasparro (1996) on communication strategies (CS) incorporating the use of corporal gestures in a Simulated Oral Proficiency Interview. This investigation uses 8 students of Spanish as a second language, 4 from beginning-level courses, to represent less proficient speakers, and 4 from 400-level courses who have been abroad, representing higher-proficiency levels. The taped interviews are transcribed to analyze the CS utilized by the participants. The analysis is expected to suggest that oral proficiency level, as stated by the ACTFL (American Counsel on the Teaching of Foreign Languages) Proficiency Guidelines, does not affect the use of corporal gestures during communication breakdowns, showing that less proficient speakers can be as effective using CS as those who are more proficient.

Oral Presentation O2.2

THE RELATIONSHIP BETWEEN LEARNING STRATEGIES AND STUDENT-PREFERRED INSTRUCTION IN SECOND LANGUAGE ACQUISITION

Lauren Suchomski and Christina Isabelli*
Hispanic Studies Department, Illinois Wesleyan University

Within the research area of second language acquisition, learning strategies play an important role by helping to explain how learners attempt to learn a language. This research explores learning strategies of students in a mid-level Spanish class along with student-preferred instructional methods. It also investigates the relation between the two. Learning strategies have been researched in relation to many variables including gender, age, and personality (Oxford 1990), but not in relation to preferred instruction. Several classes of students were surveyed for their strategies and preferred instruction method using a questionnaire with statements concerning both. The results of the questionnaire should provide a strong relation between the two items of study.

Oral Presentation O2.3

**THE EFFECT OF GENDER AND LANGUAGE PROFICIENCY ON
NEGOTIATION FOR MEANING IN YOUNG ADULT INTERACTIONS**

Bryan Foley and Christina Isabelli*
Hispanic Studies Department, Illinois Wesleyan University

This study examines whether gender and second language (L2) proficiency affect the amount and type of negotiation for meaning in interactions between young adults aged 18 to 21 years. The data were collected from 6 participants of low L2 proficiency, paired to form 3 different gender dyads, and 6 participants of high L2 proficiency paired in the same manner. The pairs worked together on a two-way speaking task in Spanish. Their conversations will be transcribed and negotiations for meaning will be enumerated according to different communication strategies (Liskin-Gasparro, 1996) to detect any differences between gender or proficiency levels. The results will have important implications for raising awareness of how to effectively create opportunities that promote negotiation for meaning in L2 speaking activities in the classroom, thus influencing the dynamics of the classroom.

Poster and Oral Presentations P70, O3.1

**CHROMATOGRAPHIC ANALYSIS OF PISUM SATIVUM
PORPHOBILINOGEN SYNTHASE MORPHEEINS**

Lindsay Sicks and David Bollivar*
Biology Department, Illinois Wesleyan University

Porphobilinogen synthase (PBGS) is a metalloenzyme present in all organisms that synthesize tetrapyrrole compounds such as heme, chlorophyll, and vitamin B-12. PBGS catalyzes the condensation of two molecules of 5-aminolevulinic acid to form the tetrapyrrole precursor porphobilinogen. An artificial gene encoding PBGS of pea (*Pisum sativum*) has previously been designed, expressed, and purified (Kervinen, et al., *Biochemistry* 39:9018-9029). The specific activity is protein concentration dependent, which indicates that a maximally active enzyme can dissociate into less active smaller units. It has been hypothesized, and subsequently supported, that pea PBGS, essential for chlorophyll biosynthesis, exists as an equilibrium of an active octamer and an inactive hexamer. These different quaternary isoforms have been named "morpheesins." Using a gel filtration (sizing) column, attempts to separate and characterize the morpheesins of pea PBGS were made. Trials were carried out in various buffers, in which the pea protein ran at a characteristic octameric elution time. Further morpheein separation was achieved on an anion exchange column, where separation of putative octamer and hexamer peaks was observed and the ratio of octamer to hexamer was directly related to the concentration of PBGS. Peaks were analyzed multiple ways, leading to the conclusions that the presence of Mg^{2+} ions appears to stabilize the octameric form of the pea PBGS, and the absence of Mg^{2+} ions appears to pull the dynamic equilibrium toward the hexameric form. These are the first analyses of the equilibrium mixture of pea quaternary forms under assay conditions. Further study is needed to confirm any interpretations.

Oral Presentation O3.2

**THE DEVELOPMENT OF CURRICULUM BASED TERRARIUM
EXPERIMENTS FOR A HIGH SCHOOL BIOLOGY CLASSROOM**

Sean Mullins and Elizabeth Balser*
Biology Department, Illinois Wesleyan University

Experiments in high school biology classrooms aid in the internalization of information for students. This has been demonstrated by Fisher et. al. and others to a great extent. I believe, however, that the intimate relationship of all things in nature is often lost on students due to the random execution of experiments in today's high school curricula. The introduction of a terrarium to the classroom environment will allow an arena for experimentation for an entire semester's worth of lessons, and will illustrate to students the connectivity of the natural world. The creation and maintenance of a classroom terrarium also instills a sense of responsibility and belonging in the students and teacher alike. The development of independent projects, experiments, and observational studies also allows students the opportunity to take an active role in their education. Teachers benefit from this by the freedom to assign extra credit opportunities and projects for students who are interested in further exploration.

Currently, there is no curriculum based terrarium lesson plans for teachers to work from. During my research, I have set up a terrarium and develop week-by-week experiments that coincide with typical curriculum lessons. I have performed these experiments, recorded data, and reflected upon their potential as experiments to be performed in a classroom. My research will include experiments on such topics as: an introduction to microscopes and microscope techniques, ecology, evolution, botany, microbiology, genetics, and the form and function of biological systems. Those conducted so far have opened the door to exciting possibilities. The terrarium and the experiments therein are on public display. The reactions of the public are being documented and reflected upon, as they may be useful in determining the level of engagement of the individual experiments and the project as a whole.

Oral Presentation O3.3

**CHARACTERIZATION OF A TIR-LIKE GENE IN THE MOSS
PHYSCOMITRELLA PATENS**

Rachael Liesman and Loni Walker*
Biology Department, Illinois Wesleyan University

Auxin is a plant hormone mediating a wide variety of plant developmental and growth processes. One way that auxin exerts these effects is by regulating gene expression.

Aux/IAA proteins are transcription repressors that interact with specific transcription factors known as ARFs. TIR and TIR-like genes encode f-box proteins that promote the ubiquitin-mediated degradation of Aux/IAA proteins and thus are also important regulators of plant development. In the presence of increased auxin concentrations, auxin binds to TIR1, promoting its association with the SCF complex. TIR1 then targets Aux/IAA proteins for ubiquitination by the SCF complex. This results in the degradation of Aux/IAA proteins and the release of ARFs. ARFs are then free to promote transcription of downstream genes important in plant growth and development.

I am interested in understanding TIR function in mosses. One TIR-like gene encoded in the moss *Physcomitrella patens* genome is 18f14. Using cloning, PCR, and sequencing techniques, I have characterized the gene structure and isolated 3 introns within 18f14.

Oral Presentation O4.1

THE FULL NELSON: A CASE OF ENGLISH PRIDE

Kristin Serna and Michael Weis*

International Studies Department, Illinois Wesleyan University

What comes to mind when someone mentions England?

Tea?

Crumpets?

A one-armed, one-eyed admiral known for his vanity, cockiness, and infidelity?

On October 21, 1805 during the Battle of Trafalgar a musketball shot through the body of Lord Admiral Horatio Nelson, eventually ending his life. The Royal Navy won that day but they also lost one of their greatest fleet commanders. The public found itself much aggrieved over the incident and a large state funeral was held. 200 years later, the English have not stopped loving Nelson. Huge celebrations were held in England during the fall of 2005 in honor of the battle as well as the man who led it. He was a devoted seaman, as well as an effective leader and a tactical genius. Yet, he was also known for his cockiness, vanity, and debauchery. Why has a man like Nelson "survived" as a hero in England all these years and what does it say about the English national character?

Oral Presentation O4.2

**RELATIONS BETWEEN THE EU AND NATO IN 2ND GENERATION
PEACE SUPPORT OPERATIONS**

Patrick Beary and William Munro*
International Studies Department, Illinois Wesleyan University

Fifteen years ago the European Union and the North Atlantic Treaty Organization were very different organizations with different purposes. The EU focused on economic and social development while NATO was a military alliance. Given their divergent origins and structures many skeptics and politicians believed cooperation between the two organizations in order to address emerging problems of regional and human security would be impossible. However, today both organizations have transformed themselves to build capacity for modern peace support operations. Drawing on interviews with officials from both organizations this paper explains the convergence. Insider perspectives reveal an encouraging picture of informal coordination for operation planning and multi-level communication between the two. The largely unofficial and ad-hoc nature of the relationship will allow both sides to play to their strengths, with experienced professionals making decisions rather than the lawyers and politicians. This amicable relationship will be crucial to handling the complex crises of the 21st Century.

Oral Presentation O4.3

**COMPLEX SIMPLICITY: AN ANALYSIS OF CLAUDE MONET'S
LONDON SERIES**

Chrissy Paarlberg and Michael Weis*
International Studies Department, Illinois Wesleyan University

Claude Monet painted his London Series at the turn of the 20th century. He painted only three views of London but created over a hundred canvases. This motif not only combined his efforts and styles to-date but also opened the door for an explosive concept: looking at each passing moment in and of itself. These paintings show his struggle to paint life as a constantly changing element. More importantly, this series exhibits Monet's impressionistic synthesis and functions as the culmination of Monet's work and even Impressionism. Without the London Series this synthesis would not have evolved into one of the most important and amazing series of the modern era of art, a series that screams with complex simplicity.

Oral Presentation O5.1

**A STUDY OF THE FEDERAL INCOME TAX STRUCTURE ON THE
CHANGING US FAMILY COMPOSITION**

Adam Michael Gray and Robert Leekley*
Economics Department, Illinois Wesleyan University

From dual-earner married couples, to opposite and same-sex cohabitation, America's family structure, lifestyles, and attitudes have been changing in recent years. This paper will provide a framework of understanding how families interact and make economic decisions. It will focus on concepts of fairness and efficiency in both historical and theoretical contexts. One of the biggest gains married partners make occurs within the Federal Income Tax system. However, this structure was created at a time when families were very traditional: working husband and childrearing, nonworking wife. This structure will be simulated to show how America's changing family structures are being affected by this obsolescent model. Results provide evidence that more and more families are becoming economically disadvantaged because they do not get the same tax incentives and breaks that married, traditional families do.

Oral Presentation O5.2

PURCHASED INPUTS VERSUS TIME INPUTS IN CHILD DEVELOPMENT

Nicholas Holland and Michael Seeborg*
Economics Department, Illinois Wesleyan University

For a number of reasons the typical family unit no longer consists of a working father and a stay at home mother. Instead families are made up of two working parents or a household headed by a single working parent. These situations force children into daycare since the parent or parents are working. In my study, I explore whether or not the child is at a disadvantage by participating in daycare. I identify two competing effects: a lost time effect and a purchased input effect. The lost time effect of having a child in daycare negatively affects a child's development because he or she misses out on time with the parent or parents. This effect could be offset by the purchased input effect which benefits the child because the parent or parents are able to earn additional income, which may be spent on educational inputs for the child. The net effect is indeterminate. I test for the stronger effect in this study by regressing math, reading, and vocabulary test scores against daycare participation, the mother's education, marital and poverty status, the number of siblings of the child, and age. I find that being in daycare does not have a significant effect on vocabulary and reading recognition scores. However, daycare has a negative effect on math and reading comprehension scores, which suggests that for these two areas the negative lost time effect is stronger than the positive purchased input effect.

Oral Presentation O5.3

**TEAM SUCCESS AND PERSONNEL ALLOCATION UNDER THE NATIONAL
FOOTBALL LEAGUE SALARY CAP**

John Haugen and Robert Leekley*
Economics Department, Illinois Wesleyan University

The salary cap structure of the NFL creates an especially interesting labor market. It fosters fierce managerial competition, facilitates the payment of billions of payroll dollars each season, and forces players to vie for a relatively limited amount of money. Because teams must spend below the salary cap each season, team personnel managers are constantly searching for trends and patterns inherent to NFL personnel allocation that will bring success to their team. I measure the relationship between spending on types of players e.g. different positions, superstars, higher paid players, etc. and team success, measured by wins, playoff appearances, and yardage. I employ regression to determine the effect of player type on the different measures of team success. I find that increasing spending on certain football positions and player types tends to increase a team's ability to win. In other words, some types of players are more valuable assets than others

Oral Presentation O6.1

**THE EFFECT OF OIL PRICES ON EXCHANGE RATES: A CASE STUDY OF
THE DOMINICAN REPUBLIC**

Jennifer C. Dawson and Diego Mendez-Carbajo*
Economics Department, Illinois Wesleyan University

Oil imports represent a significant fraction of the trade balance for energy-dependent economies. In the case of small open economies with floating exchange rates, increasing world oil prices are expected to have a large impact on the relative value of the currency. This relationship between the price of oil and the exchange rate has been well-established by the literature for oil-producing countries but not for oil-importing countries. This paper uses the case of the Dominican Republic, an energy-dependent small open economy with a floating exchange rate, to illustrate this connection. Two types of econometric analysis are used: multivariate regression and cointegration. Data are in monthly observations for the period 1991- 2005 and come from the Central Bank of the Dominican Republic and from several domestic sources. The real exchange rate is regressed on several variables including the price of oil, the relevant interest rates, past values of the exchange rate, and a trade balance variable. Results for the multivariate analysis show that increasing world oil prices do indeed put depreciating pressure on the value of the Dominican Republic's peso. Thus, increasing world oil prices cause other non-energy imports to be more expensive for the Dominican Republic. Cointegration results show that this relationship is more relevant in the short run than in the long run.

Oral Presentation O6.2

**THE EFFECT OF FINANCIAL RATIOS AND MARKET HYPE ON
SHORT TERM STOCK PRICES**

Adam F. Turk and Margaret Chapman*
Economics Department, Illinois Wesleyan University

This paper considers possible sources of short term changes in stock price. By predicting these changes, analysts can learn about the forces that drive the stock market enabling investors to earn greater returns. Studies conducted throughout the twentieth century have provided a conclusive basis for stock market analysis. The concept behind these studies is the use of intrinsic ratios to determine a change in stock price. Unfortunately, few studies have produced truly relevant results. This failure led to the introduction of a new variable into stock market analysis: hype. Hype consists of non-market factors that can affect the price of a stock. This paper makes use of financial ratios and market hype to predict changes in stock price. More specifically, this paper uses the dividend payout ratio, operating cash flow per share, earnings per share, equity per share, and analyst upgrades as indicators of changes in stock price. All of the variables are taken from the quarter immediately prior to the quarter over which the stock price was measured. Those various data are then broken down by industry in an attempt to determine how the ratios affect particular industry sectors. The results show that investors rely primarily on prior earnings information about a company when making their current period investment decisions. Furthermore, retail and restaurant stocks tend to under perform the market as a whole while hype has a significantly positive effect on the financial service and communications sectors. With these significant results, much can be learned about the predictive nature of financial ratios and market hype.

Oral Presentation O6.3

**THE PRICING EFFECTS OF EUROPEAN UNION INSURANCE
LIBERALIZATION ON ITALIAN MOTOR INSURANCE**

Andy Heikes and Jin Park*

Business Administration Department, Illinois Wesleyan University

Shifting from a government-controlled system of motor insurance regulation to a market-based system has caused unexpected outcomes in Italy. Although there is more competition since deregulation occurred twelve years ago, the government has had mixed results attempting to continue to control the market. This presentation will examine how pricing deregulation on the European Union level has caused significant changes in the Italian market. Furthermore, it will seek to develop a national solution for regulation of auto insurance pricing within the United States using Italian experience. Regulation in the insurance industry in the United States has been a subject of debate for quite some time, and although there has been consensus among researchers on the need to change current regulations, agreement on changes to make has not been quite as simple. The recommendation of this study is to implement a system of federal supervision in pricing regulation, while allowing states to conduct day-to-day oversight.

Oral Presentation O7.1

A SURVEY OF FOREIGN EDUCATED NURSES: WORKFORCE EXPERIENCE

Melissa Giegerich and Sharie Metcalfe*
School of Nursing, Illinois Wesleyan University

It is well known that the United States (US) is currently undergoing a nursing shortage. It is less known, however, that the nursing shortage is actually a global problem. Many health care agencies in the US and around the world are turning to nurses educated in other countries to fill vacant positions. Despite the increased utilization of foreign-educated nurses, there is a lack of understanding of how these nurses transition into the US workforce. This study will describe foreign-educated nurses who work in Illinois and describe the factors that affected their transition into the US professional nursing workforce. By focusing on nurses that were educated abroad and work in Illinois, the results of this study will bring the results to regional level that will help Illinois educated nurses and Illinois nursing employers to better understand the transition process foreign educated nurses undergo. An original questionnaire, entitled "A Survey of Workforce Experiences of Foreign-educated Registered Nurses," was adapted from two related studies to evaluate the demographics and work experiences of these nurses. Approximately 50 nurses educated outside the US were recruited to fill out the questionnaire through two agencies. The data will be analyzed using descriptive statistics and the results and implications of this study will be presented.

Oral Presentation O7.2

**DETECTING SUICIDE RISK IN ADOLESCENTS AND ADULTS IN AN
EMERGENCY DEPARTMENT**

Rebecca Hahn and Victoria N. Folse*
School of Nursing, Illinois Wesleyan University

Suicide is a serious health concern and was the 11th leading cause of death for all Americans, and the 3rd leading cause of death for young people from 15-24 years of age (Gould, Greenberg, Velting, & Shaffer, 2003; National Center for Injury Prevention and Control, 2003). Further, individuals who were over 65 years of age accounted for 18% of all suicide deaths in the United States (National Institute of Mental Health, 2003). The Emergency Department (ED) is an ideal setting in which to detect suicide risk (Folse, Eich, Hall, & Ruppman, 2006); screening is an important intervention in the prevention of suicide (Gould, et al., 2003). The purpose of this study was to assess the incidence of reported suicide risk in adolescents and adults who presented to an Emergency Department, regardless of chief complaint. A convenience sample, comprised of patients who presented to the Emergency Department in February and March 2006, was asked to answer a four-item Risk Suicide Questionnaire ([RSQ] Horowitz, Wang, Gerald, Burr, Smith & Klavon, 2001). Registered Nurses in the ED also collected data after interrater reliability was determined. The reliability of the RSQ was evaluated using Cronbach's alpha, and criterion-related validity was determined by correlating responses from the RSQ with the post-evaluation diagnosis. The results and implications of this study will be presented.

Oral Presentation O7.3

**THE INFLUENCES OF FEMINIST ATTITUDES ON
WHITE RACIAL IDENTITY**

Caroline Page and Kira Hudson-Banks*
Psychology Department, Illinois Wesleyan University

The college years are an important time for developing multiple aspects of identity. This study investigates the influence of feminist attitudes on White racial identity. College students (N =146) completed a series of questionnaires examining White racial identity, and feminist attitudes. Higher levels of feminist attitudes were significantly associated with the second phase of racial identity, which includes the abandonment of negative White identity and the embracing of positive identity. With regard to feminist attitudes, men were more likely than women to have conservative feminist attitudes and less likely to be in the second phase of racial identity. Women were more likely than men to have radical, liberal, socialist, womanist, and cultural feminist attitudes, which were all correlated with higher racial identity scores. This information has implications for understanding how feminist attitudes influence the development of racial identity and may provide insight on ally development during college.

Oral Presentation O8.1

**THE SELF-FASHIONING OF JAMES VI AND I IN HIS SPEECHES TO THE
ENGLISH PARLIAMENT**

Megan Mondt and Michael Young*
History Department, Illinois Wesleyan University

James VI and I (r. 1603-1625) generally is considered to be England's most scholarly monarch. He authored works on poetry, political theory, theology, witchcraft, and the evils of tobacco, all of which have been studied thoroughly. Peculiarly, and in spite of the fact that his reputation has been improving, his speeches to Parliament have received little attention. A closer look at these speeches provides more insight into the first of the Stuart monarchs. What sort of image was James attempting to project, and how self-consciously was he fashioning a public persona? What rhetorical devices did he employ toward these ends? Was he trying to inform and chastise his subjects, or was he trying to appease them and compensate for his scandalous personal life? Using my general knowledge of literary theories, James's Works, the Journal of the House of Commons, and other sources, I build upon my senior seminar paper and on my research at Worcester College, Oxford, to examine James's speeches and contemporary reactions to them.

Oral Presentation O8.2

THE SIXTIES OF TODAY: THE SDS OF THE PRESENT

Lindsay Hawley and April Schultz*
History Department, Illinois Wesleyan University

In the early 1960s, a small group of students joined together to form what would become one of the most infamous and influential protest organizations of the decade, the Students for a Democratic Society (SDS). The group was marked by intellectualism and extreme idealism; SDS pledged its adherence to the ideal of "participatory democracy," a term signifying the direct participation in political affairs by every citizen. Although the group formed in 1961, SDS is better known for the last years of its history, in which it became one of the most militant and revolutionary organizations of the sixties. Although much history of this organization ends with its formal demise in 1969, my project extends well beyond this period into the present. This presentation explores the impact of participation in SDS on its members. An analysis of the contemporary activities and writings of various former SDSers, from historians to professional organizers, reveals the ways in which they were affected by membership in the organization. Additionally, such research illustrates how SDS and its beliefs have carried on into the present day, even if the formal organization has long since ceased to exist.

Oral Presentation O8.3

**THE GHOST OF KING HAMLET: CATHOLIC IN PURGATORY OR
PROTESTANT FROM HELL?**

Bridget O'Connor and Mary Ann Bushman*
English Department, Illinois Wesleyan University

The Ghost of King Hamlet is one of the most significant characters in Hamlet because he is the catalyst that sets the play in motion. Because the Ghost's role is so pivotal to the plot, it was essential that the Elizabethan audience believed that the Ghost was real in order for the play to be successful. However, there were several different belief systems on ghosts and spirits during the time period that the play was written, including those of the Catholic and Protestant churches. Both of these belief systems are represented in the Ghost of King Hamlet, begging the question: is he Catholic or Protestant?

Oral Presentation O9.1

CHILDREN'S SOCIAL INTERACTIONS

Sarah Janota and Linda Kunce*

Psychology Department, Illinois Wesleyan University

This research used an experimental design to study social relationships of children who have a sibling with autism. Participants, children and adolescents ages 8-16, completed the experiment using computer software which presented photographs and descriptions of children presented as potential classmates. These target potential classmates varied on 2 dimensions: first, whether or not they had a physical or intellectual disability and second, whether they were of high or low physical attractiveness. The participants answered questions regarding their willingness to help, overall liking, and willingness to interact with these target potential classmates. The primary research hypothesis was that siblings of children with autism would be more compassionate toward peers with differences when their sibling relationship was activated, or primed, versus when a neutral relationship was primed. Data was analyzed using a 2 (priming) X 2 (attractiveness) X 2 (disability) mixed ANOVA design.

Oral Presentation O9.2

**THE RELATIONSHIP BETWEEN GAY-RELATED STRESS AND ETHNICITY
FOR HOMOSEXUAL AND BISEXUAL MALES**

Keyona Jarrett and Joseph Williams*
Psychology Department, Illinois Wesleyan University

Past research suggests that homosexual men of minority backgrounds tend to have more difficulties during the coming-out process because their cultural values conflict with their homosexual identity. For instance, ethnic minority homosexual males are less likely to self-disclose their sexual orientation to family and friends than Caucasian homosexual males. The current study examines the influence of ethnicity in the process of homosexual identity development in two groups of males: a Caucasian group (control) and an ethnic minority group. All of the participants self-identified as homosexual. The participants were recruited from local organizations that address issues of homosexuality. Participants were asked to sign a consent form, and they were interviewed by the student researcher (Keyona Jarrett) or other trained student researchers about their coming-out experience. The data from the interviews was statistically analyzed to determine whether minority homosexual males experienced a greater or different degree of gay-related stress than Caucasian homosexual males. A secondary analysis was also performed on data previously collected by the Lighthouse Institute. This data was used to compare the rate of substance abuse for African-American minority homosexual males, African-American heterosexual males, Caucasian homosexual males, and Caucasian heterosexual males.

Oral Presentation O9.3

**THE INFLUENCE OF RACIALIZED SOCIALIZATION ON THE
DEVELOPMENT OF WHITE RACIAL IDENTITY**

Qiana R. Cryer and Kira Hudson-Banks*
Psychology Department, Illinois Wesleyan University

In the United States, race is a socially constructed concept that affects how individuals view themselves and those around them. Racial identity is an individual's internalized, reflective appraisal of race in relation to self and others, and is a product of socialization (Feldman, 2001). The purpose of the current study was to assess the influence of racialized socialization on the development of White racial identity attitudes. A total of 146 students from a psychology subject pool participated in this investigation. Consistent with previous research, students who reported more experience with diverse environments and higher levels of awareness of racism were more likely to have progressed further within the model of White racial identity, which includes the development of a positive White identity.

Implications of these findings are discussed in terms of addressing issues of racial awareness and interactions across racial lines on college campuses in relation to previous socialization.

Oral Presentation O10.1

**HIGH SCHOOL DROPOUT DETERMINANTS: THE EFFECT OF
SOCIOECONOMIC STATUS AND LEARNING DISABILITIES**

Adrienne Ingrum and Michael Seeborg*
Economics Department, Illinois Wesleyan University

Considering the growing importance of higher education due to increased global competition, one might wonder why some students still opt to drop out of high school. Previous literature has focused on a number of determinants of high school dropouts, such as socioeconomic status and learning disabilities. However, this literature has not systematically explored the interaction between these two variables. Therefore, my research extends past literature by focusing on this interaction. A logit model is used to predict the dichotomous variable, high school dropouts, and to run simulations with varying values of the independent variables. The results show that low socioeconomic status, learning disabilities, and most importantly the interaction between these two variables increase the likelihood of dropping out of high school for students facing these challenges.

Oral Presentation O10.2

THE GENDER WAGE GAP: DOES LABOR FORCE ATTACHMENT MATTER?

Brittany Kirkpatrick and Michael Seeborg*
Economics Department, Illinois Wesleyan University

In 1964 the Civil Rights Act made it illegal for employees to discriminate against individuals on the basis of race, color, religion, and nation origin; however, a gender wage gap is still present in the United States. Thus, this paper seeks to provide some insight as to why this gender wage gap still exists and what may be causing it. Specifically, it examines whether the gender wage gap is different for blacks and whites. This paper argues that because of differences in labor force attachment between these racial groups the wage gap will be smaller for blacks than for whites. The analysis will also explore changes in these wages over time. The National Longitudinal Survey of Youth (NLSY) database and twelve OLS Regressions, one for each racial-gender group for three time periods, are used to conduct the analysis. The total wages for black females, black males, white females, and white males in 1986, 1994, and 2002 are regressed on the highest grade completed hours worked in past calendar year, and a proxy variable for labor force attachment. The results show that the gender wage gap is smaller for blacks and previous intermittent labor force attachment does affect each groups wages, but in different ways.

Oral Presentation O10.3

ECONOMIC DEVELOPMENT AND THE GENDER WAGE GAP

Sherri Haas and Michael Seeborg*
Economics Department, Illinois Wesleyan University

Differences in earnings between men and women vary widely across countries. While a small number of countries have a gender wage ratio close to equality, others exhibit inequality to the extent where men earn over three times the amount women earn. Simon Kuznets postulated that an inverted-U relationship exists between the level of economic development of a country and the degree of income inequality within it. This study predicts that a similar relationship holds between economic development of a country and the amount of gender income inequality within it. It also predicts that disparity in educational achievement between the genders will be positively related to the wage ratio, as will be the amount of general income inequality. Regression analysis is used to test the hypotheses. The study examines data on 121 countries obtained primarily from the United Nations Human Development Report. The results of the study support the hypotheses. An inverted-U relationship exists between economic development and the wage ratio. This study finds that as economic development increases the size of the gender wage gap increases, but at high levels of development the difference in earnings decreases.

Oral Presentation O11.1

SATISFYING SOPHOMORES

Jessica Lothman and Georganne Rundblad*
Sociology Department, Illinois Wesleyan University

College sophomores have been deemed invisible students. This label is the result of a combination of issues sophomore students typically face. Problems include: integration into social networks, declaration of a major, decisions regarding study abroad and/or internships, and disenchantment with the university, among others. A review of survey data reveals that sophomores at Illinois Wesleyan University are no different and face all of these problems. In addition to the above, sophomores at Illinois Wesleyan University have some expectations of the university that are not being met, such as course availability, food services, and advising. These combined forces are resulting directly in attrition of sophomores from the university.

This project works to justify and design a program that would address both universal and specific issues for sophomores at Illinois Wesleyan University. By studying programs in place at other universities and surveying Illinois Wesleyan University students I will make recommendations that Illinois Wesleyan University could implement to more effectively address sophomore-specific concerns.

Oral Presentation O11.2

**MULTICULTURAL EDUCATION AND ITS BENEFITS
FOR THE CLASSROOM**

Ashley Christensen and Lauren Suchomski and Leah Nillas*
Educational Studies Department, Illinois Wesleyan University

Within the last twenty years, multicultural education has proven to be an effective teaching practice that is beneficial both to students and their learning in the classroom. This research project investigates what multicultural education is, why it is important to implement, and provides ideas and examples of how it could be incorporated in a classroom. Using literature reviews, surveys from teachers, students and pre-service teachers, and school policies, multicultural education was shown to be pertinent and prevalent in the classroom. Beneficial ideas for implementation were also found. Knowledge of multicultural education is necessary in today's increasingly diverse society to help students feel more comfortable and to enhance their learning in the classroom.

Oral Presentation O11.3

**MOTIVATION IN LANGUAGE LEARNING:
DOES STUDENT-LEVEL MATTER?**

Megan McCarthy and Christina Isabelli*
Hispanic Studies Department, Illinois Wesleyan University

This study concerns the motivation of students in second language (L2) classrooms and the differences in motivation between lower-level and upper-level students. The goal is to determine the types of motivation held by Spanish language students based on the seven motivational dimensions set forth by D'nyne and the difference in motivation to learn the L2 between class levels. Data was compiled from approximately 100 participants' questionnaires from seven different-level Spanish classes. The results should show that motivation varies between students and class level. The results of this study agree with other research that there are many types of motivation, and that motivation for language learning changes over time.

Oral Presentation O12.1

**THE INFLUENCE OF RELIGIOUS DOGMA ON PERCEPTIONS OF MODERN
TECHNOLOGY IN THE MENNONITE COMMUNITIES OF UPPER BARTON
CREEK AND SPANISH LOOKOUT IN BELIZE**

Adam Cannon and Charles Springwood*
Anthropology Department, Illinois Wesleyan University

This study is an inquiry into how religious dogma influences social style amongst the two Mennonite communities of Upper Barton Creek and Spanish Lookout in Belize, and furthermore, investigates how this dogma molds religious convictions concerning the utilization of modern technology and the adoption of a modern lifestyle. The objectives of this study are threefold in scope: (1) to ascertain the differences in observable lifestyle between the communities of Barton Creek and Spanish Lookout, specifically how they differ socio-economically, (2) to determine the predominant beliefs concerning technology and modern lifestyle in each community and (3) how these convictions are rooted in the differing ideologies of Barton Creek and Spanish Lookout. Through observation and questioning members of each community from a comparative baseline of theological questions and topics, it becomes clear that the traditional and ascetic lifestyle of the Barton Creek Mennonites and the progressive and modern lifestyle of the Spanish Lookout Mennonites are related to contrasting notions of religious dogma that has evolved throughout their shared theological history.

Oral Presentation O12.2

2500 YEARS OF SELLING SEX: HOW MUCH HAS CHANGED?

Bonnie Brunkalla and Nancy Sultan*

Greek and Roman Studies Department, Illinois Wesleyan University

This paper examines the business of prostitution in ancient Greece and contemporary America. How much has changed in 2500 years? Focusing narrowly on the human aspect of the industry, this paper argues that there is continuity, not only in the type of women who engage in prostitution but also in the stigma placed upon such women from antiquity to today. Women engaging in prostitution today, particularly the lower class "streetwalkers", bear attributes similar to the *pornai* of ancient Greece, as women of less than full citizen status. Unable to utilize or access the privileges of citizenship, these women turn towards prostitution as a means of survival. In addition, the passage of 2500 years has not erased the stigma placed upon women in the sex trade. Women now, as in antiquity, are faced with hostile reactions towards their profession by a shame based society. These striking parallels indicate the continuity of the human aspect of prostitution.

Oral Presentation O12.3

**THE EFFECTS OF CONTACT WITH NATIVES ON DEVELOPING THE
ABILITY TO PERFORM SPEECH ACTS**

Clarissa Kastner and Christina Isabelli*
Hispanic Studies Department, Illinois Wesleyan University

This study investigates the effects that (1) contact with natives during a study-abroad experience and (2) the length of time after said experience have on the ability of the student to use speech acts, specifically requests and refusals. Participants are past study-abroad students from IWU with varying self-reported experiences. These participants took part in a role-play activity in Spanish, testing their ability to perform requests and refusals, and completed a questionnaire about their contact with natives during and since their study abroad experience. Data is expected to show that higher contact with natives leads to a better use of speech acts; due to the fact that those students used more negotiation of meaning, which leads to a more developed language ability.

Oral Presentation O13.1

LIMITS OF DIAGONALIZATION AND THE POLYNOMIAL HIERARCHY

Kyle Barkmeier and Hans-Joerg Tiede *

Computer Science Department, Illinois Wesleyan University

The question of P versus NP has long eluded complexity theorists, and has been a major area of research for the past 35 years. There is even a one million dollar bounty to the individual that can prove whether or not P is equal to NP. If the class of “efficiently” solvable languages (P) were equal to NP, a class containing many intuitively “harder” languages, it would imply that all of these “hard” languages have efficient solutions that we have not yet found. In fact, there is an entire hierarchy of increasingly difficult classes above (and containing) P and NP called the polynomial hierarchy. It has also not been proven whether or not the levels contained in it are distinct. This is where diagonalization comes in. Diagonalization is a proof method similar to a proof by contradiction that is frequently used to separate sets. However, there are good indications that diagonalization cannot be used to separate P and NP (or any similar set of classes in the polynomial hierarchy), even though it has been proven that if P and NP can be proved separate, a proof of this can be expressed as a diagonalization proof. The focus of this study is how these two seemingly contradictory statements can be reconciled for P and NP, as well as whether the same applies to higher classes in the polynomial hierarchy.

Oral Presentation O13.2

UNSUPERVISED LEARNING TO IMPROVE INTRUSION DETECTION

Daniel H. Garrette and Jinqiao Yu*
Computer Science Department, Illinois Wesleyan University

The purpose of an intrusion detection system is to determine when a computer or computer network is under attack. Intrusion detection systems take many forms. Anomaly detection techniques seek to determine what is "out of the ordinary" and to mark it as intrusive. Because of the huge amounts of network traffic that exist on any network, it is an extremely difficult task to label traffic as either normal or anomalous. Therefore many experts see a need for anomaly detection techniques that do not require labeled data. One approach to accomplishing this goal is to build clusters of network traffic. This works by dumping huge amounts of network traffic into a grid and letting a computer group the data. It can then be inferred that the data in larger groups constitute normal traffic and the data in smaller groups constitute anomalous traffic. It is the goal of this research project to improve the accuracy of this form of anomaly detection.

Oral Presentation O13.3

SMETANA'S LIBUŠE: POLITICAL STATEMENT AND NATIONAL SYMBOL

Kelly Brinker and Stephen Press*
School of Music, Illinois Wesleyan University

Czech opera during the 1860s was the nation's primary medium for nationalistic expression and consequently tied inherently to the politics of the era. At the time, the nation was divided into two political parties, the conservative Old Czechs (the staročeši) and radical Young Czechs (the mladočeši), under the shared goal to increase the home-rule of their nation. Czech operatic composer Bedřich Smetana (1824-1884) sided strongly with the younger party. This presentation will examine how Smetana exploits the current political and musical trends to convey his own political views in his most sacred nationalistic opera, Libuše.

Oral Presentation O14.1

**CURRENT INDUCED TRANSITION FROM VORTEX TO
NEEL DOMAIN WALL**

Debo Olaosebikan and Narendra Jaggi*
Physics Department, Illinois Wesleyan University

Motivated by an experimentally observed current induced transition from a vortex domain wall to a Neel domain wall, I study, theoretically, a model of four magnetic moments on the corners of a square imbedded in an infinite wire with semi-infinite domains of opposite magnetization. I consider only dipole and exchange contributions to the energy of the moments and map out a phase diagram that depicts the regions of stability of the Vortex and Neel states in the absence of current.

The final part of the calculation, still in progress, is to include the current which contributes a “spin-transfer torque” and describe qualitatively the effects on the phase diagram of the model system. It is hoped that with this work, insight into the experimental observation will be gained because of the simplicity of the model.

Oral Presentation O14.2

MICROFLUIDIC ROUTING VIA DYNAMIC OPTICAL LATTICES

Ryan Smith, M. P. McDonald, S. Neale, and K. Dholakia and Gabriel Spalding*
Physics Department, Illinois Wesleyan University
School of Physics & Astronomy, University of St. Andrews (United Kingdom)

A number of methods have been proposed that utilize active intervention for sorting micrometer-scale particulate (possibly biological) matter suspended in microfluidic channels. A passive approach may, ultimately, offer greater potential for high throughput. We propose a passive all-optical (non-invasive) method, wherein both throughput and efficiency are inversely related to the width of the injection channel. In the regime where efficiency is high, the primary limitation is associated with jamming of the device. We analyze this effect and introduce a novel method utilizing the Angular Doppler effect to create a dynamic lattice using multibeam interference in an effort to reduce jamming in the high efficiency regime.

POSTER SESSION A

9:00 - 10:00 a.m.

Odd-Numbered Posters

POSTER SESSION B

2:35 – 3:35 p.m.

Even-Numbered Posters

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 at 4:00 p.m.

Poster Presentation P1

PREGNANCY AMONG HISPANICS IN THE UNITED STATES

Alena Abens and Jane Szafraniec and Carolyn Nadeau*
Hispanic Studies Department, Illinois Wesleyan University

The statistics of pregnancies and issues relating to Hispanic women in the United States are significantly different than other ethnic groups in the United States due to the influences from Hispanic culture and social classes. In the research the social classes, age, and education of the pregnant women are compared to the statistics of whites and African Americans in the United States. The view of the use of contraceptives and the view on teenage pregnancies among the Hispanic culture are analyzed and related to the statistics found. Other factors of pregnancies such as prenatal care, abortion, the health of the women, the health of the baby, and the quality/availability of government care at the local, state, and national levels are studied. The research shows that there is a significant influence from the Hispanic culture and social classes in the United States which affects the factors in pregnancies.

Poster Presentation P2

**ORGANOCHLORINE CONTAMINATION IN DICKCISSEL
(*SPIZA AMERICANA*) EGGS AND THE POTENTIAL EFFECT ON
EGGSHELL THICKNESS**

Matthew Anderson, Brandy Blackwell, Jill Raabe, and Emma Wear
and Jeffrey Frick* and Given Harper* and Brian Peer*
Chemistry and Biology Departments, Illinois Wesleyan University
Western Illinois University

Dickcissels (*Spiza americana*) are small, sparrow-like songbirds that nest in grasslands in the U.S. and winter in Venezuela. Dickcissel populations are declining and a recent study of dickcissels collected in Venezuela documented that some birds were contaminated with organochlorine (OC) pesticides and metabolites. Dr. Brian Peer, an Illinois Wesleyan University alum and an avian ecologist at Western Illinois University, has documented that some dickcissel eggs appear to break easily when handled. Past studies of raptorial birds (e.g., eagles and falcons) have indicated that high levels of OCs were responsible for thin eggshells. The purpose of this study was to screen dickcissel eggs for 17 different OC compounds and to determine if there was a relationship between OC levels and eggshell thickness. Eggs were collected with required permits during the summers of 2004 and 2005 from nests in Illinois, Iowa and Indiana. Three approximately equal-sized eggshell samples were taken from the equator of each egg before the remaining eggshell and contents were analyzed for OC compounds via gas chromatography. Measurements of eggshell thickness were determined using a Starrett Thickness Indicator.

Poster Presentation P3

**THE ANALYSIS OF AMINO ACID SUBSTITUTIONS AT
POSITIONS ASP22 OF FNR**

Justin Ernat and Aaron Bailey and Laura Moore*
Chemistry Department, Illinois Wesleyan University

The FNR protein is an oxygen-sensing transcription factor in the facultative anaerobe, *Escherichia coli*. In wild-type FNR, a [4Fe-4S] cluster is incorporated into the protein. This results in a protein that dimerizes and can bind to specific sites in the DNA. In the presence of oxygen, this cluster degrades causing a conformational change that renders the protein inactive. The Fe-S cluster is ligated by cysteine residues at positions 20, 23, 29, and 122. Our work focuses on the effects on protein activity of amino acid substitutions at position Asp22. We studied the aerobic and anaerobic activity of the mutations Asp22Ala, Asp22Ser, Asp22Trp, Asp22Asn and Asp22Gly using Beta-galactosidase assays. Of these mutations Asp22Gly has been previously reported to be aerobically active, and it was suggested that this substitution stabilized the cluster to oxygen. Currently, under the low protein concentrations of our Beta-galactosidase assays, none substitutions have shown aerobic activity. We have also isolated Asp22Ala and Asp22Gly FNR protein. The Asp22Ala FNR protein has been characterized using absorption spectroscopy, which shows that the [4Fe-4S] cluster is not stable to the presence of oxygen. Further research will include isolation of other Asp22 FNR proteins as well as performing Beta-galactosidase assays with a higher concentration of protein.

Poster Presentation P4

**THE MAKING OF A WOMAN: AN EXAMINATION OF THE MODERN
COLLEGIATE FEMINIST**

Eric Barnes and Rebecca Gearhart*
Anthropology Department, Illinois Wesleyan University

The culture of the modern collegiate feminist, as studied through interaction with members of the Feminist Majority Leadership Alliances (FMLA) on IWU's campus, is one that carries many perceived attributes and beliefs about what it means to be a "feminist." Through the use of photographs and collaborative ethnographic research methods, the research data presented in this poster presentation will illustrate what it means to be a college "feminist." This poster presentation will also examine the titles given to people who are "feminists" and asks viewers of the presentation to question what they believe a feminist to be.

Poster Presentation P5

RESPONSIBILITIES AND ACADEMIC ACHIEVEMENT

Melissa M. Balek and Leah Nillas*

Educational Studies Department, Illinois Wesleyan University

The high school years are important for a variety of reasons, which is partially due to the many responsibilities of students inside and outside the classroom. Research studies have shown that student academic achievement can be affected by extra-curricular activities and/or part-time jobs both positively and negatively. Consequently, the goal of this research project is to gain a better understanding how extra-curricular activities and/or part-time jobs influence academic achievement. By extensively reviewing prior studies and collecting data in the form of questionnaires and interviews, a multitude of conclusions can be drawn. Overwhelmingly, students seem to advocate the importance of extra-curricular activities and/or part-time jobs, but acknowledge the range of impacts on their academic achievement.

Poster Presentation P6

**BEARS IN THE ZOO: EXPLORING PARENT AND YOUNG-ADULT
CORESIDENCE IN THE UNITED STATES**

Elizabeth Beggs and Rebecca Gearhart*
Anthropology Department, Illinois Wesleyan University

This poster presentation highlights the use of photographs and ethnographic interviews to explore the issues faced by young adults who return home to live with their parents after graduating from university. Through the photographs and personal accounts, the subjects of the research explain their reasons for returning home, express their concerns and conflicts, and recount the benefits of living with their parents. Coresidence among young adults is increasing in the United States and this presentation examines some of the advantages and difficulties of this contemporary phenomenon. The poster is meant to spark discussion between young adults and parents about the practicalities and concerns that accompany this new trend by means of comparison between personal experiences and patterns uncovered in the research.

Poster Presentation P7

**OXYGEN SENSING IN THE FNR TRANSCRIPTION FACTOR: CREATION
AND CHARACTERIZATION OF VARIANTS WITH AEROBICALLY STABLE
[4FE-4S] CLUSTERS**

Robin Johnson, and Maura Bates and Laura Moore*
Chemistry Department, Illinois Wesleyan University

Activity of the FNR protein, a transcription factor in the facultative anaerobe *Escherichia coli*, is contingent upon the integrity of a [4Fe-4S] cluster incorporated by the protein's effector domain. The cluster is ligated by cysteine residues at positions 20, 23, 29, and 122. In wild-type FNR, this [4Fe-4S] cluster degrades upon exposure to molecular oxygen, and the resulting conformational changes cause the homodimer to separate into monomers, deactivating the protein. A previous study has identified an FNR variant, Leu28His, which has an oxygen-stable [4Fe-4S] cluster. This mutant protein retains activity under aerobic conditions. Using beta-galactosidase assays to quantify in vivo FNR activity, our lab has explored the oxygen sensitivity of several other FNR variants with amino acid substitutions adjacent to ligating cysteines. While many of these proteins exhibit oxygen sensitivity similar to that of wild-type FNR, the mutants Leu28Lys, Leu28Asn, Leu28Gln, Leu28Ser, and Leu28Tyr all retain some activity under aerobic conditions. Western blot analysis suggests that this increase in activity as compared to wild-type is not due to an increase in protein concentration. These mutant proteins have been isolated and characterized by absorption spectroscopy. The spectra indicate that the [4Fe-4S] clusters of these FNR variants do exhibit some degree of oxygen stability. As only substitutions of amino acids with amine, alcohol, or amide side chains have so far resulted in aerobically active FNR, oxygen stability of the [Fe-4S] cluster may result from donation of a hydrogen bond at position 28.

Poster Presentation P8

**RELATIONSHIPS BETWEEN DOG OWNERS AND THEIR DOGS:
BENEFITS AND CONCERNS**

Emma Bland and Rebecca Gearhart*
Anthropology Department, Illinois Wesleyan University

There is archaeological evidence that domesticated dogs existed 14,000 years ago, suggesting that dogs have had relationships with humans since then. Today, about 1 of every 4 people in the U.S. owns a dog, and this poster presentation takes a look at three different relationships between central Illinois dog owners and their dogs. Among the three human subjects who are the focus of the research, one relies on her dog for companionship and security. Another considers her dog to be part of the family, just like her four children are, and the third depends on his dog for help in hunting. While the three human-canine relationships are quite different, this presentation illustrates how all of the dog owners who participated in the research share similar sentiments about the benefits they get from their dogs and the concerns they have about them.

Poster Presentation P9

INSIDE THE TRAINING ROOM

Jon Blome and Rebecca Gearhart*
Anthropology Department, Illinois Wesleyan University

This ethnographic photo-essay delves into the daily life of Illinois Wesleyan University Athletic Trainers. We all know, vaguely, what an athletic trainer is. We see them run onto the field at the Super Bowl when the quarter back gets hurt. We see them at the Olympic Games stretching out world-class sprinters. But what we see them do on the television and at sporting events is merely one facet of their job. By illustrating findings based on independent research into the history of the field of athletic training, interviews with Bill Kauth, the head athletic trainer at Illinois Wesleyan University, and participant observation in the training room at Illinois Wesleyan University, this poster presentation unearths what athletic trainers really do.

Poster Presentation P10

**THE EFFECTS OF AMGYDALAR ALCOHOL INFUSIONS ON
REWARD VALUE MAGNITUDE**

Karen Boschen and Joseph Williams*
Psychology Department, Illinois Wesleyan University

Exposure to alcohol results in deficits to attention and memory, as well as increased emotionality and risk-taking behaviors. Lesions to the amygdala also create deficits in emotional conditioning and decision-making. The present study looks at the direct effects of alcohol on the amygdala. Eight male Long-Evans rats were trained on a behavioral task to associate one stimulus with the presence of a reward and a different stimulus with the absence of a reward. A ten second delay between the stimulus presentation and the choice phase of the trial was implemented so that the rats had to remember the stimulus given. Once the rats learned to discriminate between the stimuli, guide cannulae were placed bilaterally into the amygdala. Two sets of three infusions (saline, .01% alcohol solution or 1% alcohol solution) were given immediately prior to the behavioral task. The mean differences between saline and the two alcohol infusions were compared to determine differences in performance. It was predicted that the infusions of alcohol would create deficits in memory for reward-value magnitude, but that procedural memory and motor skills would remain intact.

Poster Presentation P11

**THE INTEGRATION OF WOMEN INTO THE FLUTE SECTIONS OF MAJOR
AMERICAN ORCHESTRAS FROM 1950 TO THE PRESENT**

Deborah Boersma and William West*
School of Music, Illinois Wesleyan University

Over the past fifty years, the integration of women into the flute section of orchestras has been marked with significant events. These events include the absence of male musicians during World War II, the hiring of Doriot Anthony Dwyer as principal flutists of the Boston Symphony Orchestra, and changes in the hiring practices of orchestras in the United States. Research has shown that women have found increased opportunities in the world of orchestral flutists in recent years. The findings of this study determine that women have been increasingly successful in joining the ranks of the major symphony orchestras in America. These successes indicate the improved proportion between the number of trained female flutists and the number of active female orchestral flutists. This research supports other findings that have shown women making further advancements in their careers as society's attitude towards working women has evolved.

Poster Presentation P12

**OBSERVING TARDIGRADES OF THE MILNESIUM SPECIES
FROM ILLINOIS AND FLORIDA**

Craig Brauer and Elizabeth Balser*
Biology Department, Illinois Wesleyan University

Tardigrades, or water bears as they are commonly known, are small (~1--5 mm in length) animals that inhabit interstitial spaces in terrestrial moss and lichens and aquatic sediments. Tardigrades are bilateral micrometazoans, and a sister group to the phylum Arthropoda in Ecdysozoa. Since their discovery in 1773 by J. A. E. Goeze, relatively little has been learned about the physiology, reproductive habits, feeding habits, and distribution of the Tardigrada (Nelson, 2001, 527). The objectives of this project were to study and observe the behavior of species of Milnesium as well as compare Milnesium sp. from different habitats. A variety of observations on the anatomy, distribution, feeding, molting, egg laying, and development in specimens of Milnesium were recorded. Apart from these general observations, specimens of Milnesium from Florida and Illinois were compared. Based on differences in buccal length, stylets, and claw patterns in the tardigrades from the two locations, it is highly probable that these two Milnesium are different species. Only one species of Milnesium (*Milnesium tardigradum*) is identified in the literature, however, a Karen Lindahl provides information on morphological differences in specimens of this genus from different locations in Illinois (Lindahl 1999).

Poster Presentation P13

**HOW WELL DO YOU JOURNAL? : THE USE OF SELF-ASSESSMENT IN
FOURTH GRADE JOURNAL WRITING**

Amy Brinkman and Ana Floriani*
Educational Studies Department, Illinois Wesleyan University

This study focused on how self-assessment in journal writing benefited fourth grade students. In the course of three weeks, eighteen students wrote weekly persuasive journal essays on selected chosen topics and assessed their own progress. The study shows that the students who participated improved in their ability to recognize and articulate areas that needed improvement and areas of strength. In addition, some felt more confident in their writing skills and thus felt more comfortable taking risks in their writing. The process of assessing their own essays also helped their writing in general.

Poster Presentation P14

**HOW MOTIVATION AFFECTS THE COMMUNICATION STRATEGIES USED
BY INTERMEDIATE LEVEL SPANISH STUDENTS**

Leslie Brockley and Christina Isabelli*
Hispanic Studies Department, Illinois Wesleyan University

This study aims to investigate the communication strategies that intermediate level Spanish speakers use during discourse and if motivation for studying a second language affects the choice of strategies. This investigation replicates a previous study by J. E. Liskin-Gasparro (1996) on communication strategies during discourse. The participants were 8 males and females that were evaluated during a speaking activity requiring exclusive use of Spanish. Their conversations were analyzed for any communication strategies they employed to help convey meaning to their interlocutor. Participants also completed a motivation questionnaire. Previous research indicates that second language students will use more communication strategies that are based on their first language and their motivation will determine which strategies are used more frequently.

Poster Presentation P15

**ORGANOCHLORINE PESTICIDE CONTAMINATION IN RESIDENT
NORTH AMERICAN PASSERINES**

Amy Cadwallader and Kevin Latman and Given Harper and Jeffrey Frick*
Biology and Chemistry Departments, Illinois Wesleyan University

Organochlorine (OC) pesticide and metabolite levels were determined in resident North American passerines and woodpeckers collected in McLean County, Illinois. Sixty-nine of 77 individual birds contained OC compounds above detection limits, including all eighteen species examined. Total contamination levels in individual birds ranged from 7.47 to 2,274.23 ng/g. The most prevalent OC compound was p,p'-DDE, which was present in 45 birds; dieldrin was found in 30 birds, heptachlor and heptachlor epoxide were each found in 27 birds, and p,p'-DDT was found in 25 birds. There was no significant difference in total OC levels between males and females, between HY and AHY birds, and between birds that bred and wintered in more northern latitudes. There was a significant difference in total OC levels between diet categories. Omnivores had significantly higher total OC levels than granivores. House sparrows had significantly lower total OC levels than both white-throated sparrows and American robins.

Poster Presentation P16

**BEYOND LUNCH MONEY: PREVENTION AND INTERVENTION
STRATEGIES FOR BULLYING**

Sarah K. Christensen and Leah Nillas*
Educational Studies Department, Illinois Wesleyan University

For years, bullying has been regarded as a normal part of childhood that children must learn to deal with and grow out of. Recently, however, researchers and educators have begun to acknowledge that bullying should not be regarded as normal and that the effects of bullying can be debilitating and life-long. This study explores both student and educator perceptions of bullying. Students were surveyed about their perceptions and experiences in bullying situations. Educators were asked about the prevention and intervention techniques that they implement in cases of bullying situations. The findings of this survey support the need for the education of both educators and students on bullying and effective ways to prevent and intervene. Both students and educators need to feel empowered to make a difference in the school environment and feel that they have the knowledge and training to do so.

Poster Presentation P17

**THE SYNTHESIS OF CAGE SHAPED MOLECULE USING
POLYOXOMETALATES AS A TEMPLATE**

Thomas Traynor and Matas Cyvas and Rebecca Roesner*
Chemistry Department, Illinois Wesleyan University

Polyoxometalates are large anionic clusters that form between oxygen and transition metal ions, especially the following d-zero species: V (V), Nb (V), Ta (V), Mo (VI), and W (VI). We propose to use a large, negatively charged, polyoxometalate as a temporary internal scaffold for preparation of a capsule shaped host molecule from two macrocyclic hemispheres. Because the target capsule molecule will have a cryptand-like shape with interstices between the macrocyclic straps, we anticipate that hydroxide ions should be able to penetrate the interior of the capsule promoting fragmentation of the polyoxometalate. The polyoxometalate will thus be a disintegrable scaffold. Most of our research to date has focused on multistep synthesis of the macrocyclic hemispheres from a cyclam precursor.

Poster Presentation P18

**FISHER ESTERIFICATION OF A RHODIUM SUBSTITUTED KEGGIN-TYPE
POLYTUNGSTOPHOSPHATE**

Jeffrey W. Donelan and Rebecca Roesner*
Chemistry Department, Illinois Wesleyan University

Polyoxometalate (POM) chemistry is an emerging field with many applications in catalysis, electrochemistry, and medicine. Keggin-type POMs have the formula $[XM_{12}O_{40}]^n$, where M is an early transition metal and X can be almost any element. In recent years, chemists have become interested in attaching organic ligands to POMs for the purpose of creating immobilized polyoxoanion catalysts.¹ In our present work, a rhodium substituted Keggin-type POM with a pendent carboxylic functional group ($[PW_{11}O_{39}RhCH_2COOH]^{5-}$) was synthesized by previously reported methods.^{1,2} This POM was then converted to its methyl and ethyl ester derivatives through Fisher esterification with the appropriate alcohols. The ester products were then characterized by NMR and IR spectroscopies. A further effort is being made to immobilize the carboxylic acid functionalized polytungstophosphate through Fisher esterification with alcohol functionalized resin beads.

1. Wei, X. Dickman, M.H.; Pope, M.T. *J. Am. Chem. Soc.* **1998**, *120*, 10254-10255.
2. Unpublished results. Binder, J., Roesner, R. Illinois Wesleyan University.

Poster Presentation P19

**BEYOND THE GYM: A GLIMPSE INTO THE CAREER OF
FEMALE COACHES**

Crystal Dye and Rebecca Gearhart*
Anthropology Department, Illinois Wesleyan University

The world of athletics continues to provide the United States with a variety of memorable moments; especially with regards to college athletics. Throughout the past century, athletes have awed the American public with their amazing skills, while often overlooking the coaches who have directed them along the way. This poster presentation will represent the careers of female collegiate coaches, who coach women's teams at the Division III level. The poster illustrates the responsibilities that accompany the coaching profession, while providing insight into some of the positive and negative aspects of being a female coach at the Division III level.

Poster Presentation P20

**PRACTICAL PROBLEM SOLVING DEPENDS ON EXPERIENCE AND
STRATEGY USE**

Emily Eickhorst and Jean Pretz *
Psychology Department, Illinois Wesleyan University

Intuition can be described as a holistic yet uncertain sense of knowing that people often rely on to make decisions and solve problems. This is in contrast to analysis which requires a step by step breakdown of a problem. Past research suggests that intuition may be a successful problem-solving strategy, especially for experts. This has been attributed to experts large amount of experience; however, recent evidence has suggested that expert problem solving performance also depends on intuitive cognitive style. The present study examined the effect of expertise and strategy use on an individual's ability to solve practical, everyday college problems. Participants were IWU students with varying levels of experience in college life. College experts were junior and senior residential advisors and greek peer counselors. Participants solved problems using either an intuitive or analytical strategy or followed their preferred intuitive or analytical cognitive style. Results showed an interaction of strategy use and expertise. Novices performed better when using intuition, while more experienced participants performed better using analysis. Further research is needed to determine under what conditions and for what type of people the intuitive strategy is the most helpful.

Poster Presentation P21

THE EFFECT OF 9/11 ON THE FIRE FIGHTER LABOR MARKET

Kathleen Frawley and Michael Seeborg*
Economics Department, Illinois Wesleyan University

On September 11, 2001, three planes, hijacked by terrorists flew into the World Trade Center Towers and the Pentagon. As thousands of people fled these terrifying scenes of destruction, it was the fire fighters and first responders that went running toward them to save lives. In the post-September Eleventh world, fire fighters are now responsible for doing even more to save the lives of American citizens. The increased demand for fire fighters and their services has manifested itself in the form of increased grants for equipment, more mandatory training, and greater roles and responsibilities in preventing, responding to, and recovering from acts of terrorism. Under the framework of derived demand, this paper hypothesizes that the increase in demand for fire protection services has led to a rightward shift in demand in the fire fighter labor market, producing increased employment levels and wages. This theory is tested by estimating supply and demand equations for fire fighter employment and wages with a focus on how the increased risk associated with 9/11 effects fire fighter employment and wages. Using a regression method that allows us to estimate these supply and demand equations simultaneously, we can control for the factors, such as unemployment, that influence both supply and demand simultaneously and estimate the effect September Eleventh has had on the fire fighter labor market. This paper finds that while 9/11 has had some effect on fire fighter wage, it has not caused any change in fire fighter employment levels; a problem which must be dealt with in the labor intensive field of fire fighting.

Poster Presentation P22

**TO TELL OR NOT TO TELL? HOW DISCLOSURE OF A SPEECH OR
MENTAL DISORDER AFFECTS EMPLOYABILITY**

Reve Fisher and Linda Kunce *

Psychology Department, Illinois Wesleyan University

The purpose of this study was to examine the impact that disclosure of a mental disorder (i.e. bipolar disorder) and a speech disorder (i.e. stuttering) has on person perception and employability. Participants viewed a picture and heard a recording of an individual applying for a university work-study job. They saw one of six scenarios which manipulates the type of disorder (bipolar disorder or stuttering) and level of disclosure (none, visually indirect, verbally direct), then they rated the individual on person perception, personal reactions, and gave hiring recommendations. Results may indicate that disclosure of a disorder affects the manner in which people view a person, as well as the apparent capabilities that this person has for several on-campus jobs. Is it predicted that disclosure of an overt, speech disorder will be looked upon more favorably than disclosure of a covert, mental disorder. The results may be helpful for those who have disorders who are trying to decide whether or not to disclose them to those in their daily lives.

Poster Presentation P23

THE ECOLOGY ACTION CENTER: AN ETHNOGRAPHIC PHOTO-ESSAY

Michael Gabriele and Rebecca Gearhart*
Anthropology Department, Illinois Wesleyan University

This photo-essay focuses on the Ecology Action Center: a grassroots environmental organization located in Normal, Illinois. The research presented describes how the organization first appeared, and how it has evolved to what it is today. The photo-essay also includes information gleaned from ethnographic interviews with four current staff members at the Ecology Action Center. The consultants provide the reader with important insights into what the Ecology Action Center is all about, and the photographs reinforce key issues by giving the reader a glimpse of what is most important to those who know the Ecology Action Center and its work best. The presentation is based on ethnographic research data collected through participant observation and ethnographic interviewing. It also reveals common patterns in environmental grassroots organizations, thus offering a comparative perspective that situates the Ecology Action Center in a larger context of current environmental initiatives.

Poster Presentation P24

**READING FOR MEANING: THE EFFECTS OF STUDENT CHOICE ON
READING COMPREHENSION IN THE EARLY GRADES**

Tyler Garofalo and Ana Floriani*
Educational Studies Department, Illinois Wesleyan University

Controversy exists in the education world about the best way to teach reading. Although much research highlights effective methods, this study addresses whether students who struggle with decoding and fluency improve their reading comprehension when they are given more responsibility for or a lead in their reading. Using Guided Reading as a focus, first graders were observed when a teacher led the instruction of a book and then again when students choose the literature and formulated discussion. Kindergarten and first grade teachers completed a questionnaire which asked how they assessed comprehension and their overall feelings about letting students guide their own learning. The findings show that many students choose books which would not be considered at their ability level, yet still succeeded in reading and comprehending the book. Student questions and discussions were much more focused on items other than the text, such as pictures or photographs, and less concerned with factual recall.

Poster Presentation P25

**HEALTH OF CORAL REEFS OPEN TO FISHING COMPARED TO CORAL
REEFS CLOSED TO FISHING IN THE TANGA REGION OF TANZANIA**

Rebecca Gericke and Given Harper*
Biology Department, Illinois Wesleyan University

Coral reefs are one of the world's most valuable ecosystems, but they are being destroyed at an alarming rate. Anthropogenic factors, especially over-fishing and destructive fishing, contribute greatly to the destruction of coral reefs. In an effort to improve the health of coral reefs, conservation organizations worldwide have imposed fishing bans on select reefs. This preliminary study tested the hypothesis that coral reefs closed to fishing have greater absolute fish densities, lower absolute sea urchin densities, and a larger percentage of hard coral substrate cover than reefs open to fishing. The reefs were closed under the management plans of the Tanga Coastal Zone Conservation and Development Programme in Tanzania. Underwater counts of fish, sea urchins, and substrate cover were conducted on 18 coral reefs in the Tanga Region of Tanzania from November 8-25, 2005.

Poster Presentation P26

**ASTEROSTEMMA DEPRESSA! A GLYPTODONT FROM THE MIOCENE
OF NORTHERN CHILE**

Susan C. Grana and Darin Croft*
Biology Department, Illinois Wesleyan University

Glyptodonts are a group of extinct large, armadillo-like mammals that were distributed throughout the Americas during the Miocene Period of the Cenozoic Era (ca. 18 millions years ago). Although most glyptodonts from this period were relatively small and "primitive", one species *Asterostemma depressa* was larger than most species and is known from sites in Patagonia (so. Argentina) . I describe here the results of an examination of a partial fossil skeleton of a glyptodont collected from the Chucal (formation) of northern Chile. The fossil collection from Chucal is rich in ungulate groups such as notoungulates and litopterns, but it is unusually poor in armadillos and glyptodonts, both of which are abundant in temporally equivalent sites of southern South America. The species of fossil mammals recovered from Chucal suggest a Santacrucian South American Land Mammal Age (SALMA) for the fauna. During the Santacrucian SALMA (about eighteen million years ago, during the early Miocene), most glyptodonts still were small and rather 'primitive'. This paper describes an *A. depressa* from the Chucal fauna of northern Chile based on one partial skeleton, Analysis of the left mandible (jaw), several neck vertebrae, articulated foot bones, a chevron (accessory vertebra of the tail), and various free osteoderms. The osteoderms and mandible were valuable in this identification, as *A. depressa* is characterized by a depressed central figure of the osteoderms and by lower front teeth that are neither rounded nor reniform. The large size of the fossils supports referral to this genus. The Chucal fauna is the first fauna from the Chilean Altiplano region, and at present this *Asterostemma depressa* specimen is the only glyptodont recovered from Chucal. At present, it also is the only *A. depressa* known from a location other than Patagonia.

Poster Presentation P27

**THE EFFECTS OF TEMPERATURE AND ELEVATION ON THE
ACTIVITY OF UTAH'S BATS**

Megan D. Guse and Elizabeth Balser*
Biology Department, Illinois Wesleyan University

Knowledge about species composition and distribution of the bat populations in Utah are valuable data sets that can be used not only to benefit the bat species, but humans as well. Utah's bats are insectivores and therefore control many insect populations that are considered to be pests to humans. However a general lack of knowledge about these bat populations hinders creation of programs that protect bats while maintaining appropriate land use for humans. Using methods established by the Great Basin Bat Cooperative, two 30km² areas of Utah were studied in order to gather data on the bat populations within these areas. These data were then analyzed to determine if trends between bat activity and temperature and elevation were present. Knowledge about these trends, especially when applied to the entire state of Utah, will help to enhance the management techniques for these important species.

Poster Presentation P28

LITHOGRAPHY FROM THE "GROUND UP"

Daniel Haeger and Matt Wilhelm and Gabriel Spalding*
Physics Department, Illinois Wesleyan University

Micro-fabrication techniques are used to construct miniaturized circuitry, diffractive optical elements, and 3-D micro-mechanical systems, which find application in a wide range of scientific and engineering projects. We have begun the work of setting up a laboratory for micro-lithographic preparations, which has included establishing a low-level clean room environment. We will use a variety of photo-lithographic and electron-beam lithographic techniques to machine various mechanical or electrical systems. Already, we have begun work with a computer interface (put in place by Brian Simonds, IWU Class of 2005, working with engineers from the Japanese Electro-Optics Corporation) that is designed to take over control the Illinois Wesleyan electron microscope, allowing us to steer the electron beam so as to draw desired patterns/circuits. We are currently establishing/calibrating basic protocols for the associated chemical processing that is required, and so our first samples consist of low-resolution micro-fluidic channels and test patterns aimed at refining our resolution limits. Our goal is to create a laboratory for instruction and student research, not only for micro-machine fabrication, but also for basic materials preparation and processing. And we hope to gain the knowledge that comes with the reality of lab work and the union of several disciplines, computer science, chemistry, and material physics.

Poster Presentation P29

KEEPING THE FIRE ALIVE: CAUSES AND MEANS OF PREVENTION FOR TEACHER BURNOUT

Stephanie Hajdu and Stephanie Olsen and Leah Nillas*
Educational Studies Department, Illinois Wesleyan University

A career in elementary education affords an individual with the opportunity to positively influence the future of children. Due to the nature of the profession and the responsibility it demands, teaching becomes a highly stressful occupation and teachers are at a high risk for burnout. This study identified major causes and means of prevention for teacher burnout. Data was collected from an analysis of current literature, twenty-four teacher surveys, and six personal interviews with teachers from one public elementary school located in Central Illinois. The findings of this study represent a comprehensive collection of the causes and prevention of teacher burnout based on literature, and teachers' personal experiences. Through this research, it is hoped that preservice teachers, teachers, and administrators gain practical knowledge in preventing teacher burnout in their workplace.

Poster Presentation P30

**A COMPARATIVE STUDY ON SECOND LANGUAGE COMPREHENSION
ABILITIES: POST STUDY-ABROAD RETENTION**

Kevin Hartleben and Christina Isabelli*
Hispanic Studies Department, Illinois Wesleyan University

This study focuses on the ability students at the ACTFL (American Council on the Teaching of Foreign Languages) intermediate level have on comprehending social conversations in their second language (L2) once removed from the study-abroad environment. This study determines if length of time away from the study-abroad context plays a factor in the loss of any L2 abroad gain. Two groups who have studied abroad at different times and 1 group without study-abroad experience but at an equal college Spanish-level will be tested on grammar and speech acts (complaining, apologizing, and humor). I predict a gap in comprehension between the most recently returned group and the others, supporting my hypothesis that comprehension ability is determined by L2 cultural saturation.

Poster Presentation P31

**A NOVEL APPROACH FOR INVESTIGATING STANDING WAVES USING A
DUAL-DRIVEN VIBRATING STRING APPARATUS**

Chris Hatfield and William Brandon* and Andrew Morrison*
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A harmonically driven stretched string is often used in the introductory physics laboratory to familiarize students with the concept of resonance and the notion of eigenmodes. The exercise is highly visual in that prominent vibration amplitudes will result under the proper resonance conditions. We have developed a novel approach to study string vibrations using a dual-driven vibrating string apparatus and the resulting behavior is described. Interestingly, we have found that the simple cases resulting from both drivers tuned to the same resonant frequencies with a predetermined relative phase have not previously been fully characterized. In addition, more fascinating phenomena emerge when we tune the drivers to different harmonics from one another while controlling their relative phase. Our motivation is to create a direct analogy between interference behavior in our simple apparatus and sum and difference frequency mixing such as that associated with nonlinear optical phenomena, and perhaps an indirect analogy to the superposition of states and the “collapse of a wavefunction” inherent to quantum systems.

Poster Presentation P32

RIBOSOMAL SHEDDING HYPOTHESIS

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Protein kinases regulate a number of signal transduction pathways. These enzymes phosphorylate proteins, which leads to functional changes. Protein kinase C (PKC) belongs to a subgroup of protein kinases and is important in regulating cell growth and cancer in humans. In signal transduction, several PKC kinases utilize the protein Receptor Activated C Kinase protein1 (RACK1). RACK1 has a homologue in yeast, Asclp.

Yeast Asclp is tightly bound to the ribosomal 40S subunit of cells growing in logarithmic phase, but may dissociate as cells reach stationary phase (Biochem J. 380:823-30, 2004). The dissociation of Asclp from the 40S ribosomal unit may cause post-translational silencing. Research on the mechanism of post-translation silencing in Asclp may lead to a better understanding of cancer in humans. This research reexamines the hypothesis that Asclp is found in the ribosomal fraction during logarithmic phase, but dissociates from the ribosome as yeast cells reach stationary phase.

Poster Presentation P33

PARENT-TEACHER COMMUNICATION: A DIFFERENCE IN PREFERENCE?

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The purpose of our research is to determine the preferred method of communication for teachers and parents. With the strong integration of technology into schools, teachers rely on their regular access to the internet and email to communicate with parents; however, not all parents/guardians have these same tools available to them. Thus, there is a gap in the communication between teachers and parents/guardians. One objective is to determine the availability of communication tools for teachers and parents. Another objective is to determine teacher and parent preferred methods of communication. Interviews and surveys are used to collect data. Preliminary findings show that teachers choose email as their overall preferred method of communication due to time and accessibility. The findings from this study may increase the level of communication between teachers, parents and schools; thus, influencing overall student development and teacher-parent rapport.

Poster Presentation P34

**ORGANOCHLORINE COMPOUNDS IN NORTH AMERICAN
GREY WOLVES (CANIS LUPUS)**

Stacy Hynes and Ryan Misek, and Jeffery Frick* and R. Given Harper*
Biology and Chemistry Departments, Illinois Wesleyan University

Grey wolves (*Canis lupus*) historically ranged in North America from 20° North latitude in Mexico throughout most of the U.S. and Canada. The grey wolf population has been declining since 1900 and today sizeable grey wolf populations are restricted to Alaska, Canada, Idaho, Wyoming, Montana, Michigan, Minnesota, and Wisconsin. Since the grey wolf is at the top of its food chain, this species may contain high levels of organochlorine (OC) pesticides (e.g., DDT) and metabolites due to biomagnification. However, no studies have documented OC pesticide contamination in grey wolves throughout their North American range, which is the purpose of this study. This ongoing study is being performed in collaboration with the U.S. Fish and Wildlife Service, state wildlife agencies and Canadian Wildlife agencies. Wolves were either found dead or they collected via lethal control methods in Wyoming, Montana, Idaho, the Northwest Territories, Alberta, and Alaska. The presence of OC compounds in wolves will be determined via gas chromatography. If detected, OC contamination patterns will be analyzed in relation to sex, age, diet and latitude. The knowledge gained from this study may have implications for managing other top predators in North America (e.g., red wolves (*Canis rufus*), Mexican grey wolves (*Canis lupus baileyi*) grizzly bears (*Ursus arctos*), and polar bears (*Ursus maritimus*)).

Poster Presentation P35

INVESTIGATING FARADAY ROTATION USING ALTERNATING CURRENT MAGNETIC FIELDS

Jaclyn Nesbitt and Robert Inzinga and William Brandon*
Physics Department, Illinois Wesleyan University

Motivated by recent investigations of Faraday rotation using alternating current magnetic fields,^{1,2,3} we have constructed a simple apparatus providing accurate Verdet constant measurements at the highest modulation frequencies to date. Specifically, we have measured the Verdet constants of water, ethyl alcohol and SF59 flint glass with magnetic field frequencies ranging from a few hundred Hz to approximately ten kHz. Agreement with accepted values is obtained up to three or four kHz, depending on the sample, when compared to the tabulated values for these materials using conventional DC Faraday Effect measurements. However, we have found an unexpected enhancement of the Faraday rotation at the higher frequencies and we are presently attempting to understand these anomalous results. Presently, we are assuming that this increased response results from an experimental artifact and we in search of any potential procedural inadequacies that could account for this behavior before we can report the results as evidence of "new physics". So, we will continue to fine-tune our technique with the aim of either further extending the frequency limits, and hence the fidelity of the high frequency response of the apparatus before justifying an indisputable, and as of yet, unpredicted modulation frequency dependent response.

- 1 K. Turvey, "Determination of Verdet constant from combined ac and dc measurements," Rev. Sci. Instrum. 64 (6), 1561-1568 (1993).
- 2 O. Brevet-Philibert and J. Monin "The measurement of the Faraday effect in alternating magnetic fields: a new and simple method," Meas. Sci. Technol. 1 362-364 (1990).
- 3 A. Jain, et al. "A simple experiment for determining Verdet constants using alternating current magnetic fields," Am. J. Phys. 67 (8), 714-717 (1999).

Poster Presentation P36

**THE RELATIONSHIP BETWEEN MOTIVATION AND LEARNER OUTPUT
AND ITS EFFECTS ON THE DEVELOPMENT OF ORAL PROFICIENCY IN
SPANISH AS A SECOND LANGUAGE**

Jessica Jones and Christina Isabelli*
Hispanic Studies Department, Illinois Wesleyan University

This study will examine the development in oral proficiency and its relation to learner motivation at the level that satisfies the Second Language requirement at Illinois Wesleyan University. The participants are 2 students, one male in his first-year of college and one female in her second. The analyses are based on survey data and 3 tape-recorded 15-minute conversations between participants and a near-native Spanish language tutor. With a theoretical basis in motivation and the American Council for the Teaching of Foreign Language (ACTFL) guidelines in relation to communicative competence, this study rates the students' oral proficiency and connects it to their self-reported levels of motivation to draw a correlation between a learner having motivation to learn the language and his/her successful development of oral communication skills.

Poster Presentation P37

**CORRELATIONS BETWEEN MOTIVATION AND LANGUAGE LEARNING
STRATEGIES OF SECOND LANGUAGE (L2) LEARNERS**

Kristina Kalous and Christina Isabelli*
Hispanic Studies Department, Illinois Wesleyan University

Learning strategies are considered to be a critical facilitating factor in students acquisition of a second language (L2). Recent research in second language acquisition has also proven motivation to be a critical factor in the student s overall learning process and capabilities. In order to investigate these factors on lower-level university students (n=40), participants were given a questionnaire in which they self reported their personal motivations and most utilized learning strategies. Possible differences and correlations between motivational factors and various learning strategies as well as influence of gender on these variables are analyzed. Implications for future research are discussed.

Poster Presentation P38

WHEN IS INTUITION A RELIABLE PROBLEM-SOLVING STRATEGY?

Amy Kowalski and Jean Pretz*

Psychology Department, Illinois Wesleyan University

This study tests the hypothesis that problem attributes affect how appropriate the strategy of intuition is for solving problems (Hammond et al., 1987; McMackin & Slovic, 2001). The study investigated the appropriateness of strategy (intuition, analysis, or no strategy) when solving everyday problems with varying levels of complexity and social content.. It was predicted that highly social and complex problems would be solved more accurately using intuition than analysis. Results indicate that there was no significant effect for strategy condition. However, further analyses indicate that individual differences in intuitive and analytical cognitive style affect the accuracy of problem solving, in particular for problems that are highly complex and non-social.

Poster Presentation P39

**THE DEVELOPMENT AND STRUCTURE OF FEEDING ARMS IN
ANTARCTIC SPECIES OF PTEROBRANCHS**

Catherine Krahe and Elizabeth Balser*
Biology Department, Illinois Wesleyan University

Pterobranchs are small colonial animals that live in tubes attached to hard substrata on the sea floor. They are members of the phylum Hemichordata, which shares characteristics with vertebrate animals and other chordates. The focus of the research presented here is to examine the development, structure, and function of the feeding arms in several species of pterobranchs collected from depths greater than 300m from waters surrounding Antarctica. Pterobranch zooids in the genus *Cephalodiscus* feed a crown of arms held over the body to filter particles from the water. Larvae released from adult tubes are ciliated, but lack feeding arms and are thought to derive energy from internal yolk stores. However, we have observed larvae of at least one species respond to the presence of particulate food. A swimming larva bathed in a cloud of particulate food will begin to swim in vertical circles through the cloud; some have secreted mucus and dragged particles of food out of the cloud. One possible explanation is that the larvae feed using structures other than the feeding arms prior to arm development, including pretentacle structures or endocytosis. The larva may also be reacting to the particulate matter as a nuisance and avoid fouling in much the same way. Pterobranch larvae begin development of the feeding arms at the end of the free-swimming larval stage, though larvae remain mobile. The arms develop on the dorsal side of the animal, often beginning with a pair near the central axis followed by pairs of arms to the left and right. Each arm develops from a trilobed bud. At some point in development, the arm grows to its full length and has numerous lateral extensions, called pinnules. These pinnules are ciliated and are involved in capturing food particles. The adult feeding apparatus consists of up to twelve arms held in a sphere on the dorsal side of the animal. Each arm has multiple pinnules, which are paired along the length of the arm until the apicalmost tip. Scanning electron microscopy reveals that a single pinnule has two tracts of cilia along its outer face which may beat to draw water across the tentacular net or capture food particles. Food particles, including bacteria and single-celled algae, may then be conveyed down the pinnule to a deep, thickly ciliated groove on the outer face of the arm central to the paired pinnules, and eventually to the mouth. Scanning electron and light microscopy have elucidated the structures associated with feeding, as well as unusual refractive spheres at the tip of each arm in some species. The function of these spheres is unknown.

Poster Presentation P40

**THE DEVELOPMENT OF PERFECTIONISM AMONG ADOLESCENTS:
COMPARING THE INFLUENCE OF FRIENDS AND PARENTS**

Heather Kwoka and David Hibbard*
Psychology Department, Illinois Wesleyan University

This study investigated the development of perfectionism in adolescence by examining the associations between perfectionism, parenting styles, and friendship experiences. Furthermore, this study investigated the nature of perfectionism by examining whether internal psychological characteristics (e.g., loneliness, depressive symptoms, anxiety, self-esteem, and life satisfaction) were associated with the development of types of perfectionism (e.g., adaptive and maladaptive) or orientations of perfectionism (e.g., self-oriented or socially prescribed). Gender differences regarding each of these components were also explored. Questionnaires were completed by sixth, seventh, and eighth grade adolescents that measured perfectionism, internal psychological characteristics, perspective on parenting styles, and friendship quality. Three general findings emerged. First, results revealed a noteworthy gender difference regarding the relationship between the orientation of perfectionism and internal psychological characteristics. That is, males appeared more negatively affected by perfectionism than females. Second, a significant relationship was found between parenting styles and the types and orientations of perfectionism. Authoritarian parenting was associated with maladaptive, adaptive, self-oriented, and socially prescribed perfectionism. Third, counter to predictions, no significant relationship was found between the types or orientations of perfectionism and the quality of the adolescents' friendships. Overall, this study helps to better understand the role of perfectionism in the adolescents' developments.

Poster Presentation P41

QUANTIFIABLE TORQUES FOR MICROFLUIDIC STUDIES

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Huge scientific advances have arisen from the ability to measure forces to high resolution. While Atomic Force Microscopes can reliably measure forces in solution down to around 10 pico-Newtons, force measurements well below that scale have been required to elucidate, e.g., basic mechanisms involved in the molecular motors responsible for muscle response. In this regime, non-invasive optical forces have become an invaluable tool. Just this year, the range of convincing calibration of optical forces has been extended down to 20 femto-Newtons! This opens up, for example, the possibility of studying the entropic forces involved in the statistical mechanics of DNA.

The study of torques has received less attention. It is our intention to use optical forces to push the limits of sensitivity for the measurement of torque in solution.

Our initial efforts have involved reproducing the current state of the art, an approach developed in 2004 by the Queensland group.¹ We utilize a circularly polarized laser beam to transfer angular momentum to a birefringent „probe“ particle (a micro-sphere of CaCO_3) in solution. By tightly focusing the laser beam, we create strong electromagnetic gradients that allow us to trap and manipulate the probe. Our ability to quantify the torques generated by our laser beam will depend on our knowledge of three key parameters: the frequency of the laser light, the power applied to the probe particle, and changes (per photon) in the polarization state of the transmitted beam.

1. „Optical Microrheology Using Rotating Laser-Trapped Particles,“ A. Bishop, T. Nieminen, N. Heckenberg, H. Runbinstein-Dunlop, Phys. Rev. Lett. 92, 198104 (2004).

Poster Presentation P42

**CROSS-TALK BETWEEN RHO GTPASES REGULATES ACTIN
CYTOSKELETON AND CELL MOVEMENT**

Katherine Lee and HeeDon Chae, and Yi Gu and Elizabeth Balser*

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Division of Experimental Hematology, Cincinnati Children's Hospital Medical Center

Guanosine triphosphatases (GTPases) are small enzymatic proteins associated with the plasma membrane that are important in cell movement and proliferation. RhoH is a unique GTPase because it is exclusive to hematopoietic stem cells (precursors of all blood cells) and because, unlike many GTPases, it does not cycle between active and inactive states. These two characteristics directed our study of RhoH and its interaction with two additional GTPases, Rac1 & 2. Our studies show that RhoH can block the activity of Rac1 & 2 in regulation of cytoskeleton formation and cell movement, as seen in cell division. We identified specific portions of the RhoH gene sequence responsible for its localization and activity, allowing for mutation studies. RhoH is found in cells that precede blood cells, and it has important implications for bone marrow transplants and gene therapy treatments. Future studies will continue to characterize the actions of RhoH through interactions with additional proteins in the signaling process.

Poster Presentation P43

**ARE CHILDREN BEING LEFT BEHIND? THE EFFECTS OF SES AND
LEARNING STYLES ON ACADEMIC ACHIEVEMENT**

Kristy Lehan and Megan Teschner and Leah Nillas*
Educational Studies Department, Illinois Wesleyan University

Why does there tend to be such a difference in achievement between students with varying socioeconomic status (SES)? Many researchers have tried to determine why such a correlation exists between SES and academic achievement and, furthermore, how this can be alleviated. The intent of this research is to explore the relationship between SES and achievement and to determine whether or not learning styles have an effect on this relationship. We have utilized surveys to analyze students' learning styles and some of the resources available to students in order to determine why socioeconomic status makes such an impact on student's achievement in the classroom. Since there has not been any published research on this topic, we hope to add to the existing literature that attempts to explore and alleviate the negative relationships between SES and academic achievement.

Poster Presentation P44

**IN VIVO DEMONSTRATION OF PROTEIN-PROTEIN INTERACTIONS
BETWEEN HERPES SIMPLEX VIRUS TYPE-1 PROTEINS UL20 AND GK
DURING VIRAL EGRESS FROM INFECTED CELLS**

Rachael Liesman and Elizabeth Balser* and Konstantin Kousoulas*
Biology Department, Illinois Wesleyan University

Recent evidence suggests a functional relationship between Herpes Simplex virus type-1 membrane proteins UL20 and gK. UL20 and gK likely interact to permit viral exodus from an infected cell, a process necessary for further viral infection of surrounding cells. We sought to demonstrate UL20 and gK interactions using a split-ubiquitin yeast two-hybrid system. Contrasting with traditional yeast two-hybrid experiments, the split-ubiquitin yeast two-hybrid system allows us to investigate interactions between integral membrane proteins such as gK and UL20. Confocal microscopy was also used to determine the intracellular localization of UL20 and gK. UL20 has been successfully fused into the bait vector and shown, through interactions with a control prey vector, to be properly inserted into the membrane. UL20 and gK have been shown to co-localize to the trans-golgi network (TGN) by confocal microscopy.

Continued study and increased understanding of viral patterns within infected cells can lead to better treatment and prevention of viral infections, as well as the use of HSV-1 as a medicinal vector to treat genetically-based disease.

Poster Presentation P45

DETERMINING 17,-ESTRADIOL LEVELS IN NATURAL WATER SOURCES

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Endocrine disrupting chemicals (EDCs) have become an increasing concern. These chemicals may mimic hormones and can disrupt the normal functioning of the endocrine system. If they are present in wastewater, they are often not removed by wastewater treatment processes. Therefore, as wastewater treatment effluent is released to the environment, these compounds may cause adverse affects in wildlife, such as a change of gender in various aquatic species or an increase in sterility. Because they are also seldom removed in drinking water purification, humans may also be affected through exposure to these compounds in drinking water from surface water sources. Previous studies show levels of EDCs in several water sources in the microgram per liter range. It is not yet known what levels of EDCs will pose a threat to the ecosystem or what levels should be considered safe for human consumption. However, studies indicate that even these low levels of EDCs can be detrimental. Of particular concern are synthetic estrogens originating from pharmaceutical sources, for instance, the oral contraceptive. Two compounds have been analyzed: 17 β -estradiol and 17 α -estradiol. To test for these compounds, water samples were collected from two locations on Sugar Creek, filtered, concentrated through solid-phase extraction, derivatized into their trimethylsilyl ethers, and analyzed by gas chromatography and mass spectrometry with electron impact ionization and selected ion monitoring. Our results show that 17 -estradiol is present in these samples at the nanogram per liter level.

Poster Presentation P46

**READING BETWEEN THE LINES: THE IMPACT OF MULTICULTURAL
LITERATURE ON CHILDREN'S PERCEPTIONS OF PEOPLE OF
DIFFERENT CULTURES**

Sara Lockman and Leah Nillas*
Educational Studies Department, Illinois Wesleyan University

Within the last twenty years, the number of multicultural children's books has greatly increased. Previous research has indicated that the use of this literature has an impact on children. This study focuses particularly on how multicultural children's literature affects students' perceptions of people of different cultures. Through a small focus reading group, pre- and post-reading surveys, and an informal discussion, this study addresses how students' views of people may change from the reading of a multicultural book. The results of this study are significant to anyone working with children and can specifically help teachers and administrators know how the books they read to children can impact students toward cultural acceptance.

Poster Presentation P47

EXAMINATION OF COMMUNICATION STRATEGIES

Michael Mastro and Christina Isabelli*
Hispanic Studies Department, Illinois Wesleyan University

The problem of the investigation is if level of Spanish-speaking students affects the types of communication strategies used in order to learn a second language. The study will include students from introductory and intermediate Spanish classes. I will provide a questionnaire for the students to discover their interest in the investigation. If they have an interest, the learners will be divided in two level based pairs in order to perform a task based on Frank Brooks' "jigsaw task." In order to record conversations, a tape recorder will be necessary. I will transcribe the conversations of the two groups and examine the different communication strategies used in the conversations. It's my goal to determine different communication strategies used in different levels of students.

Poster Presentation P48

ORGANOCHLORINE PESTICIDE CONTAMINATION IN MINNESOTA GREY WOLVES (*CANIS LUPUS*) AND WHITE CEDAR (*THUJA OCCIDENTALIS*)

Leah Maurer and Amanda Solliday, and Lindsay Schelling
and Given Harper* and Jeffrey Frick*
Biology and Chemistry Departments, Illinois Wesleyan University

This study examines patterns of organochlorine (OC) pesticide (e.g. DDT) contamination in grey wolves (*Canis lupus*) and northern white cedar (*Thuja occidentalis*) collected from Minnesota. Few studies have been conducted to document OC contamination in wolves from North America, which may accumulate high levels of the compounds because they are at a high trophic level. Conifers are good indicators of atmospheric organic contamination because of the lipophilic nature of their needles. Kidney and bark samples were collected in 2002 and 2003 and tested for the presence of 17 OC pesticides and metabolites utilizing gas chromatography. The wolves were taken via a lethal control effort by personnel from the Animal and Plant Health Inspection Service (APHIS) division of the USDA. Forty-four of 55 kidneys contained OC compounds in amounts above the lower detection limit. In the kidneys where pesticides were found, the level of total OCs ranged from 7.89 to 1,647.01 ppb (parts per billion). Of the 15 bark samples tested, all contained OC pesticides in detectable levels. Total OC levels in individual samples ranged from 504.56 to 10,244.1 ppb. There was no significant difference in total OC levels between adult and juvenile wolves. Likewise, there was no significant difference in total OC levels between males and females. However, total OC levels in tree bark (Median (M) = 2,357.26 ppb) were significantly greater than total OC levels in wolves (Median (M) = 92.53 ppb). Conifers are unable to metabolize OC compounds, which may explain the higher concentration in the bark samples. Our results confirm that OC contamination still exists in the tissues of organisms in North America, despite a ban on the use of these compounds for a considerable number of years.

Poster Presentation P49

USING FLUORESCENCE TO MONITOR STRUCTURAL CHANGES IN THE DIMERIZATION HELIX OF THE TRANSCRIPTION FACTOR FNR

Kate McCulloch and Laura Moore*
Chemistry Department, Illinois Wesleyan University

Fumarate nitrate reductase (FNR) is an oxygen-sensing transcription factor in the facultative anaerobic bacteria *E. coli*. Although FNR is a widely-studied protein, little is known about its structure. FNR is a sequence homologue to catabolite receptor protein (CRP) in *E. coli*, and its structure is likely similar to CRP. When oxygen is absent, FNR is in an active dimeric form and contains a [4Fe-4S] cluster. Upon exposure to oxygen, the [4Fe-4S] cluster degrades to a [2Fe-2S] cluster and the protein subunits dissociate to two monomers. The structural changes that occur between these two forms are not well characterized. In this study, we use fluorescence spectroscopy to better understand the conformational changes between the active and inactive forms of FNR. Tryptophan, an amino acid with intrinsic fluorescent properties, has been used to replace some amino acid residues within the proposed dimerization helix of FNR. Changes in fluorescence emission wavelength indicate changes in the environment around the tryptophan, and are used to determine relative positions of amino acid residues within the dimerization helix. From preliminary data, the mutant FNR protein with tryptophan at position G149 does not have any significant change in emission wavelength upon exposure to oxygen, suggesting the environment around this residue does not change. However, the emission wavelength of the mutant protein at position M143 differs significantly between the anaerobic and aerobic forms. These data suggest that position 143 becomes exposed to solvent in the monomeric form and is isolated from solvent in the active dimeric form of the protein.

Poster Presentation P50

**THE CROSS-CULTURAL CHARACTERISTICS OF CONFLICT AMONG
INDONESIAN, SOUTH KOREAN, AND UNITED STATES ADOLESCENTS**

Melissa McCandless and Doran French*

Psychology Department, Illinois Wesleyan University

Conflict is a common characteristic of interpersonal relationships across all developmental periods and many consider it an inevitable aspect of close relationships. It is evident that there are significant differences across cultures in terms of implicit models and understandings of conflict and how it should be resolved. The current study explores reports of conflict in reciprocated friendships in Indonesian, South Korean, and United States adolescents. Data from U.S. seventh grade students (N=123, Mean age of 12.45 years) was collected and compared to data previously obtained in Indonesia and South Korea (French, Lee, & Pidada, in press). Using multiple measures, data was collected on several dimensions of friendship including loneliness, intimacy, exclusivity, and conflict. Male and female Korean children reported significantly more conflict with reciprocated friends across both measures of conflict compared to U.S. and Indonesian youth. Reports of conflict across close relationships revealed that Indonesian youth reported more conflict with friends compared to Korean and U.S. youth who reported more conflict with mothers. Relationships with siblings were also more conflictual across all three countries with U.S. students reporting significantly higher amounts.

Poster Presentation P51

**"WHAT'S MY MOTIVATION?" UNDERSTANDING MOTIVATION OF
HIGH SCHOOL ACTORS**

Adam Miller and Leah Nillas*

Educational Studies Department, Illinois Wesleyan University

This research investigated the motivation of high school actors in light of stage fright and fear of public speaking. Through survey, observation, and interview, high school actors motivation was examined and reasons for doing theatre were uncovered. Results showed that high school actors, while the vast majority do experience some degree of stage fright, overcome fear through personal and individual means. The reason students desire to confront the fear is their passion for theatre. Students who perform more did not necessarily experience less fear, but did have a more defined approach to coping with the fear. Extending these results into the classroom, to make students more comfortable giving speeches, the topics should be something the students value.

Poster Presentation P52

**HANDS-ON MATHEMATICS: DOES IT AFFECT
STUDENTS' ACHIEVEMENT?**

Megan McCarthy and Leah Nillas*
Educational Studies Department, Illinois Wesleyan University

As mathematics education is constantly changing, it is important for teachers to update their teaching styles accordingly. This study concerns the teaching strategies of algebra teachers and the effectiveness of these styles. Specifically, the research objective is to determine if the use of hands-on mathematics in a high school algebra classroom affects students' achievement. Data was collected from two high school algebra classrooms through student and teacher surveys. One classroom was taught traditionally while the other implemented hands-on mathematics in the classroom. It is expected that this research study will benefit mathematics teachers and preservice teachers in implementing teaching styles that promote students' achievement.

Poster Presentation P53

DON'T FAIL ME BECAUSE I'M DIFFERENT: CULTURAL BIAS IN THE SATS

Khalilah Muhammad and Leah Nillas*

Educational Studies Department, Illinois Wesleyan University

Past research indicates that standardized testing is biased against various individuals (source). This research project expounds upon past research by tailoring its focus to standardized test bias apparent in five elements of culture; race, gender, socio-economic status, heritage, and language. Its goal is to identify elements of cultural bias that are present in such standardized tests as the Scholastic Aptitude Test (SAT). Sample SAT test documents were collected and analyzed for cultural bias in terms of race, gender, socio-economic status, heritage, and language. Previous research was used as a guide for determining whether a particular item was biased. Results show that all five elements of cultural bias are present in the SAT, though these biases are not as prevalent as in the past.

Poster Presentation P54

**EMOTIONAL DEVELOPMENT IN CHILDREN RECEIVING
HEAD START SERVICES**

Meghan E. McGrady and Gail Walton*
Psychology Department, Illinois Wesleyan University

This study examined the ability of 3- to 5-year-old children receiving Head Start services to identify the six emotions (happiness, sadness, anger, fear, surprise, and disgust). Participants were randomly divided in to two groups; face first or story first. Children were then asked to identify either the emotions depicted by facial expressions (face first group) or the emotions described in behavioral stories (story first group). A Behavior Superiority Effect for fear, anger, and disgust indicated that the story was significantly more helpful than the face in the identification of these emotions. Participants who were unable to correctly identify the emotion based on the face or story were provided with additional information in the form of a story or face (face first received story, story first received face). The subsequent presentation of the story to children in the face first condition significantly increased the number of correct responses. In both conditions, children's ability to correctly identify emotion increased with age.

Poster Presentation P55

**READY OR NOT: ARE TEACHERS AND STUDENTS PREPARED TO
EMBRACE WRITING IN MATHEMATICS?**

Katie Navin and Katie Wesolik and Leah Nillas*
Educational Studies Department, Illinois Wesleyan University

As verbal and written communication become increasingly important in today's world, teachers of all content areas must prepare students with these necessary skills. Therefore, there is a need to explore both the use of writing in mathematics as another form of assessment and teachers' preparation for introducing writing in their mathematics classrooms. This study explores teachers' and students' dispositions towards writing with mathematics through the qualitative analysis of questionnaires completed by both teachers and students. The questionnaires were analyzed to determine if teachers are willing to implement writing in their mathematics classrooms and if students are ready to meet these new expectations. This research is designed to benefit administrators, teachers, and students.

Poster Presentation P56

**THE VALUE OF LABORATORY EXERCISES IN HIGH SCHOOL
BIOLOGY CURRICULA**

Sean Mullins and Kristine Miller and Venus Evans-Winters*
Educational Studies Department, Illinois Wesleyan University

The purpose of our study is to demonstrate the value of laboratory experiences in high school biology classrooms. We will be expanding on previous research by Fisher et. al. (1998) who explored the value of the laboratory experience to academic success of high school students. To accomplish our goal we are conducting a weekly after-school experiment club at public semi-suburban high school. Using a sample of twelve high school students, who have volunteered to participate, we will obtain both quantitative and qualitative data. Our goal is to increase both the academic performance of biology students, and their interest in science in general. Preliminary data shows high levels of interest and inquiry among participants in the laboratory exercises. Because research shows that students in the United States are falling behind in the areas of math and science, and the global economy is becoming more dependent on professionals proficient in science and technology, this research has immediate implications for curriculum, instruction, and science education.

Poster Presentation P57

EFFECTS OF DOSEC DELETION MUTANTS

Mai Nguyen and Laura Moore*
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Escherichia coli is a facultative anaerobic bacterium that utilizes different metabolic pathways when the oxygen concentration changes. Among many enzymes that regulate these pathways, DosEC is a purported direct oxygen sensor and a heme-regulated phosphodiesterase. When the central heme is at the +2 oxidation state, the conformation of the N-terminal domain changes, resulting in the activation of the C-terminal domain in DosEC. When activated, this domain breaks down cAMP, an important secondary messenger in the cell signaling pathway. In this study, we investigate the role of DosEC in the metabolism of *Escherichia coli* by comparing the growth rate of wild type and deletion mutants of dosEC in minimum media and/or oxidative stress conditions. We will also monitor the activity of DosEC by examining cAMP level. We expect to see a difference in the cAMP level between the wild type and the dosEC deletion mutant strains.

Poster Presentation P58

**FRIENDSHIP AND LONELINESS OF SPANISH AND
UNITED STATES ADOLESCENTS**

Cristina Muniz and Doran French*
Psychology Department, Illinois Wesleyan University

Features of friendship quality across cultures were assessed using the Friendship Quality Questionnaire with seventh grade students from Spain and the US. Multiple issues regarding social support from various agents were also examined using the Networks of Relationships Inventory. Relationships between friendship and social support, and loneliness were studied. Adolescents in both countries who had low social support from friends, reported higher more loneliness. Levels of social support from mothers, fathers, and siblings had no effect. Spanish scored higher in most of friendship scales and social support provided by friends. Gender differences arose only for US, with females scoring higher in intimacy, conflict, companionship, affection, and instrumental aid with regard to their friendships. No difference was found between the countries in loneliness. These results support the suggestion that relationships with friends become particularly salient. The importance of friends as agents of social support are apparent both in the US and Spain.

Poster Presentation P59

**DISTRIBUTION AND COLOR PATTERNS OF CHROMATOPHORES IN THE
GRASS SHRIMP PALAEMONETES SP.**

Nurman Noor and Elizabeth Balser*
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The ability to change body color to suit the environment is essential for many species as a mechanism to avoid predation. This is achieved in some crustaceans through the expansion and contraction of four different pigments in the chromatophores or pigment-bearing cells in their dermis (Anger, 2001). The coloration in *Palaemonetes* sp. was analyzed by observing both the action and the distribution of chromatophores. Shrimp were cultured in dishes with different background colors, either fully covered or only on the bottom. Individuals were further examined to determine if they expressed visible change after a certain amount of time. Our results show that the distribution of chromatophores was more intense on the anterior region of the body. Additionally, color changes were observed in the shrimp cultured in fully covered dishes, while the shrimp cultured in the dishes that were covered only on the bottom did not express color change. Between the shrimp cultured in different background colors, variety of chromatophoric actions was observed.

Poster Presentation P60

**REPRESENTING THE STERLING FLOWER SHOPPE: A VISUAL
ETHNOGRAPHY OF A SMALL FAMILY BUSINESS**

Sarah Osborn and Rebecca Gearhart*
Anthropology Department, Illinois Wesleyan University

Using the collaborative ethnographic research methods of anthropology and the visual media of photography, this poster presentation serves as a point of entry to understanding the concerns of and issues faced by the employees of the Sterling Flower Shoppe in Peoria, Illinois. By reflecting on their lives through interviews with the ethnographer and examining their own photographs and those that were taken during the ethnographer's participant-observation of their daily lives, the subjects conclude that they share a common cultural identity in having shared family values in a small business environment. This research draws attention to the balance that exists between work and family in a small business setting, where employees have both literal and figurative "family" relationships with their co-workers. Subjects commonly share an understanding that the balance they maintain in their lives stems from the values they all share, values which are frequently found in family businesses and which are examined in this presentation.

Poster Presentation P61

AN EVALUATION OF ENVY WITHIN ADOLESCENT FRIENDSHIPS

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Psychology Department, Illinois Wesleyan University

Envy may be an unexplored component of adolescent social relationships. The main goal of the study was to determine if envy is experienced to a higher degree between best friends than with non-friends. A second goal was to assess the correlations between envy and friendship characteristics. A total of 109 seventh-grade students responded to 2 questionnaires, the Best Friend/Non-Friend Envy Survey and the Friendship Qualities Questionnaire. No significant differences were found between reported envy for friends and non-friends. Envy significantly correlated with conflict ($p < .01$) and exclusivity ($p < .05$). A major challenge for future research is to develop a more accurate measure of envy; self-reporting may not be the most useful technique. The relationship between envy and conflict and exclusivity demonstrates the importance of further research of envy in order to better understand the potentially negative effects of envy on friendships.

Poster Presentation P62

**GRADUAL LOSS: THE EXPERIENCE OF RELATIVES OF
DEMENTIA PATIENTS**

Karen Petersen and Rebecca Gearhart*
Anthropology Department, Illinois Wesleyan University

By means of collaborative ethnographic research methods and photography, this poster presentation seeks to provide education about the causes and effects of dementia, so that others may understand what the families of dementia patients experience. Currently, an estimated 4.5 million Americans suffer from irreversible dementia. At present, no cure exists for irreversible dementia ñ a chronic, debilitating syndrome that leads to both mental and physical degradation of those afflicted. Obviously, an ill person with dementia suffers immeasurably; however, family members also face a particularly tragic experience. Caring for a family member with dementia can be an overwhelming burden which lasts for many years. Clearly, every family's experience is unique, yet many confront similar issues. This research highlights those issues and emphasizes how relatives of dementia patients cope with their experiences.

Poster Presentation P63

**SHE WORKS HARD FOR THE MONEY: STRIPPERS COPE WITH ISSUES OF
CONCERN TO THEIR COMMUNITY**

Korey Reynolds and Rebecca Gearhart*
Anthropology Department, Illinois Wesleyan University

Through the use of collaborative ethnographic research and photography, this poster communicates issues that arise within the stripper subculture, and creates a forum in which these topics can be openly and honestly discussed. By means of interviewing and producing photographs, this visual ethnography addresses topics raised by the participants such as exploitation and empowerment, the morality of stripping, and the costs involved with stripping as a profession. The use of photography allows the reader a closer contact with this particular subculture and further expresses the stories told by the women performers. A common theme that runs throughout the photo-essay is the misunderstood lifestyles of these women and their responses to these interpretations.

Poster Presentation P64

DOES THE EARNED INCOME TAX CREDIT REDUCE POVERTY?

Monica Rose and Margaret Chapman *
Economics Department, Illinois Wesleyan University

Adopted in 1975 as an income equity measure, the Earned Income Tax Credit is now the largest anti-poverty initiative in the United States. The Earned Income Tax Credit is basically a refundable tax credit that reduces or eliminates the taxes that low-income working people pay, increasing income and reducing the level of poverty. This paper attempts to measure the efficiency of the federal Earned Income Tax Credit in reducing the level of poverty among different groups. I use information from the March 2004 Supplement of the Current Population Survey, which includes nationwide information on citizens such as marital status, number of children, income, and ethnicity among other factors. I also use information from the Internal Revenue Service to calculate the Earned Income Tax Credit and I take my measure of poverty level income from the poverty guidelines from the Department of Health and Human Services. The results of this study show that the Earned Income Tax Credit does not reduce the poverty gap for all eligible taxpayers, and only a small amount of taxpayers' incomes are pushed above the poverty level of income with the help of the Earned Income Tax Credit.

Poster Presentation P65

**A TALE OF TWO DISTRICTS: A CLOSE LOOK AT THE EFFECTS OF
TRACKING IN THE ENGLISH CLASSROOM**

Ashley Samsa and Rebecca Sutton and Leah Nillas*
Educational Studies Department, Illinois Wesleyan University

Tracking is a highly debated topic in schools today, with much of the research supporting a shift towards mixed-ability grouping. Still, an estimated 85% of schools still track their students in some way. This study focuses on two neighboring school systems that hold very differing philosophies on tracking. Through interviews, surveys, and student writing samples, this study compares the effects of tracking and mixed-ability grouping on students' social and academic welfare. Results suggest that the grouping policy implemented may have a significant impact on students in both of these arenas. Educators need to carefully consider the implications of tracking and mixed-ability grouping in order to make a decision that best meets the needs of their students.

Poster Presentation P66

**THE EFFECT OF PREDATION ON THE FECUNDITY OF TWO SUBTIDAL
SNAILS WITH DIFFERING REPRODUCTIVE STRATEGIES**

Kristina Sawyer and Elizabeth Balser* and Christopher Siddon*
Biology Department, Illinois Wesleyan University

A great deal of diversity exists in reproductive strategies among gastropod snails. These animals exhibit a variety of reproductive methods including broadcast spawning, release of planktonic larvae, and encapsulation of eggs. Females of *Fusitriton oregonensis* lay a flat round egg mass that they then guard against potential predators for 7-8 weeks until the eggs hatch as free-swimming veliger larvae. Crawl-away juveniles of *Neptunea lyrata* hatch 8-12 months after laying from a tall cylindrical egg mass that is not guarded. I tested the effects of predation by urchins (*Strongylocentrotus droebachiensis*), and two sea star species (*Evasterias trochellii* and *Pycnopodia helianthoides*) on these two different egg cases. I exposed egg cases of *F. oregonensis* to the predators both with the adult snails present and with them experimentally removed. I found that none of the predators consumed any of the guarded egg cases. The urchins, however, had a significant impact on the unguarded egg cases. I performed the same experiment with the naturally unguarded egg cases of *N. lyrata*. None of the predators consumed any of the egg cases in this experiment. Clearly, the guarding behavior of *Fusitriton oregonensis* was an important aspect of their reproduction, whereas the egg cases of *Neptunea lyrata* were likely protected by other methods.

Poster Presentation P67

**. DIFFUSION AND AGGREGATION OF METAL ATOMS ON
QUASICRYSTALLINE SURFACES**

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Chemistry Department, Illinois Wesleyan University
Chemistry Department, Iowa State University

Quasicrystals are aperiodic structures with long-range orientational order. Unlike typical crystalline structures, quasicrystals do not have a unit cell, although similar groupings of atoms can be found repeatedly throughout the structure. Some quasicrystals exhibit interesting and potentially useful combinations of properties such as high heat conductivity, low coefficient of friction, and good wear resistance. The objective of this project was to investigate the interaction of metal atoms with a quasicrystalline surface, specifically the diffusion and aggregation of these atoms after deposition on the surface. The first part of the project focused on analyzing diffusion of silver atoms on an aluminum-palladium-manganese quasicrystal surface through computational techniques. Using a model potential energy surface for bonding of a silver atom to the quasicrystal, the relative positions of adsorption sites and activation barriers for hopping between them were determined. With this data, the effective diffusion coefficient was calculated at various temperatures. The second part of the project focused on describing by kinetic Monte Carlo simulation the diffusion and aggregation of aluminum atoms on an aluminum-copper-iron quasicrystal surface to compare with experimental observations.

Poster Presentation P68

**THE ROLE OF COLLECTIVE SCAFFOLDING FOR SECOND LANGUAGE
LEARNERS: A STUDY OF STUDENTS AT DIFFERENT PROFICIENCY
LEVELS OF THE SPANISH LANGUAGE**

Sarah Schwartz and Christina Isabelli*
HispanicStudies Department, Illinois Wesleyan University

Many studies (R. Donato (1994), B. Adair-Hauck and R. Donato (1994), and C. Kinginger (2002)), have focused on the Zone of Proximal Development (ZPD) (L.S. Vygotsky). In the ZPD, students of a second language will learn through interaction with a more experienced speaker, a process called scaffolding. While Vygotsky studied scaffolding between a student and a more advanced speaker, this study ponders the success of scaffolding between students of similar proficiency levels. To study this, 1 pair from each of 3 different levels of Spanish will be studied for their uses of negotiation of meaning (interactions that take place when a misunderstanding occurs). The findings may show scaffolding can occur between students but only at upper levels of proficiency, which may help educators in creating activities for their students.

Poster Presentation P69

**GENERATION OF A LENTIVIRAL-BASED RNAI VECTOR TO STUDY V(D)J
RECOMBINATION IN PRIMARY B CELLS**

Sheila Setork and LoniWalker*
Biology Department, Illinois Wesleyan University

B cells are a primary component of the immune system and the body's humoral defense against pathogens through their production of antibodies. The B cell antigen receptor region contains a segment known as Variable Diversity Joining (V(D)J), which undergoes V(D)J recombination during the pro-B cell stage to generate a repertoire of lymphocytes that produce a broad range of antibodies. Many factors affect this process of V(D)J recombination; our focus has been on the histone methyltransferase G9a. We hypothesize that important aspects of V(D)J recombination are in fact regulated by G9a, which has previously been shown to have an impact on gene expression and histone modification in B cells. The goal of this research was to create a lentiviral-based vector that would enable us to easily and efficiently perform RNA interference (RNAi) experiments in primary cells. RNAi is a process that targets a gene of interest, halting translation and therefore expression of the gene. It is used in order to determine the effects of removing a particular gene; in our case, G9a. To make the vector for use in RNAi experiments, we began with the plasmid plenti6. We then removed the poisonous ccd_{b1} gene using a polymerase chain reaction method and replaced the Blasticidin gene with Green Fluorescent Protein (GFP). This plasmid will allow us to generate a lentivirus that expresses GFP and eliminates G9a in mouse cells. Future work will utilize this plasmid to synthesize G9a-deleted cells and subsequently, determine the role of G9a in the gene regulation process and V(D)J recombination in B cells.

Poster and Oral Presentations P70, O3.1

**CHROMATOGRAPHIC ANALYSIS OF PISUM SATIVUM
PORPHOBILINOGEN SYNTHASE MORPHEEINS**

Lindsay Sicks and David Bollivar*
Biology Department, Illinois Wesleyan University

Porphobilinogen synthase (PBGS) is a metalloenzyme present in all organisms that synthesize tetrapyrrole compounds such as heme, chlorophyll, and vitamin B-12. PBGS catalyzes the condensation of two molecules of 5-aminolevulinic acid to form the tetrapyrrole precursor porphobilinogen. An artificial gene encoding PBGS of pea (*Pisum sativum*) has previously been designed, expressed, and purified (Kervinen, et al., *Biochemistry* 39:9018-9029). The specific activity is protein concentration dependent, which indicates that a maximally active enzyme can dissociate into less active smaller units. It has been hypothesized, and subsequently supported, that pea PBGS, essential for chlorophyll biosynthesis, exists as an equilibrium of an active octamer and an inactive hexamer. These different quaternary isoforms have been named "morpheins." Using a gel filtration (sizing) column, attempts to separate and characterize the morpheins of pea PBGS were made. Trials were carried out in various buffers, in which the pea protein ran at a characteristic octameric elution time. Further morphein separation was achieved on an anion exchange column, where separation of putative octamer and hexamer peaks was observed and the ratio of octamer to hexamer was directly related to the concentration of PBGS. Peaks were analyzed multiple ways, leading to the conclusions that the presence of Mg^{2+} ions appears to stabilize the octameric form of the pea PBGS, and the absence of Mg^{2+} ions appears to pull the dynamic equilibrium toward the hexameric form. These are the first analyses of the equilibrium mixture of pea quaternary forms under assay conditions. Further study is needed to confirm any interpretations.

Poster Presentation P71

**AN ANALYSIS OF NEGOTIATION OF MEANING STRATEGIES UTILIZED
BY SPANISH STUDENTS WHILE PERFORMING A JIGSAW TASK**

Scott Simons and Christina Isabelli*
Hispanic Studies Department, Illinois Wesleyan University

This investigation focuses on several phenomena of second language (L2) speaking in pair work: communication strategies utilized by students and use of scaffolding in creating discourse. 10 Spanish L2 students of varying proficiency levels and a control group of 2 native Spanish-speakers orally performed a 20-minute task in Spanish. The conversations were recorded and transcriptions were analyzed as set by Liskin-Gasparro (1996). The results of this and related studies offer insight as to how L2 students negotiate for meaning while speaking and to what degree pair work helps students acquire a second language.

Poster Presentation P73

AN ANALYTICAL STUDY OF THE JHA DECISION-MAKING PROCESS: THE ORGANIC STRUCTURE CURRENTLY UTILIZED IN THE POLICY AREA

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DIS, Copenhagen

The European Union (EU) is a live organism. It constantly evolves, adapting to the changing national and global environments. For that reason, its decision-making processes are often so dynamic, contradictory, and competitive as to be difficult to comprehend. This is especially true for the Union's newest policy area: Justice and Home Affairs. The authors believe, however, that due to the insecurity prevailing in the contemporary world, this area of the Union will become increasingly more important. It will become a cornerstone of its workings.

Due to the dynamism of the system, the authors of this paper felt it appropriate to illustrate the decision-making process within the JHA area through a diagram. Using this model, the paper will discuss the history and development of the JHA area; the role EU institutions and Member States play within this field and how they interact with each other; and the theories through which one can begin to unravel these complicated webs of relations.

Poster Presentation P74

**"LOS DETECTIVES PRIVADOS SOMOS LOS TERMOMETROS DE LA
MORAL ESTABLECIDA": THE SPANISH DETECTIVE NOVEL AS
RESISTANT TEXT**

Erin Triplett and Carolyn Nadeau*
Hispanic Studies Department, Illinois Wesleyan University

The detective novel is a highly popular and easily identifiable form of popular literature. Although it is commonly taken as mere entertainment, authors frequently utilize the concrete form of such a novel to present elements of social criticism to their readers. This often results in the creation of what Linton refers to as a "resistant text." Spanish detective novels written after the death of dictator Francisco Franco present a perfect example of how the classic form of the detective novel can be used to present social criticism that allows mainstream readers to enter into and understand an outsider's world.

Poster Presentation P75

A STUDY OF THE MOVEMENT AND STRUCTURE OF GENUS HALTERIA

Bridget Wall and Elizabeth Balser*
Biology Department, Illinois Wesleyan University

Freshwater ponds teem with life of many varied and strange sorts, and the protozoan of the genus *Halteria* is an example of the great biodiversity present inside a single drop of pond water. These ciliated protozoans have the ability to move up to 20 body lengths in the blink of an eye, giving the appearance that they "jump" through the water. The body structure of *Halteria* has been studied by previous researchers, revealing a possible anatomical structure for this jumping, but the mechanism for this movement remains unexplained. However, some hypotheses have been put forth by scientists attempting to account for the odd movement patterns of *Halteria*. Additionally, the evolutionary significance for this type of movement also remains unknown and unpostulated, but will be discussed. In this study, the jumping movement will be both observed and evaluated for time between jumps and also for velocity calculations.

Poster Presentation P76

**LABELING SIGMA PI: A LOOK AT STEREOTYPING FRATERNITY
MEMBERS AT ILLINOIS WESLEYAN UNIVERSITY**

Dane White and Rebecca Gearhart*
Anthropology Department, Illinois Wesleyan University

Stereotypes are encountered every day, especially on a college campus. When we see a physically fit male in a sports jersey, we think "jock." When we see a person carrying a musical instrument we think a "musician." When we see a guy wearing Greek letters we think "Frat Boy," a term usually associated with drunkenness and partying. A member of a fraternity is usually not considered to be part of a group of talented, motivated, diverse and relaxed individuals, or as members of Sigma Pi refer to themselves, as a group of "all right guys." On the campus of IWU in particular, the Sigma Pis have become known as the intelligent though somewhat eccentric fraternity. As one Sigma Pi member explained when asked how Sigma Pis are seen on this campus, "dork, not an athlete, or not a Sigma Chi," Sigma Chi being the generalized "jock" fraternity on campus. While such labels are often incorrect, it is true that Sigma Pi does look for a higher caliber of student with traits that compliment their house. Thus, Sigma Pi does in some respects self perpetuate the labels given to it by the community. Sigma Pi, like many fraternities is labeled both by the Illinois Wesleyan Community and by themselves with both negative and positive effects.

Poster Presentation P77

QUARTET REVISITED

Elizabeth Hope Williams and Sara Freeman*
Theatre Department, Illinois Wesleyan University

Two years ago, as I rode along on the U-bahn in Berlin, Germany, reading a collection of plays by the German playwright Heiner Mueller, I would have never imagined that today, my mind would still be taken with the complexity of his text, *Quartet*. Since I am still so enchanted and inspired by *Quartet*, I propose a research honors project that will delve into this multifaceted text and transform it into a multifaceted performance piece.

While the complexity of *Quartet* is somewhat intimidating I choose to recognize it as an opportunity to explore the various artistic media that might be used in order to effectively convey both the plot and the philosophies behind the plot to an audience. Through dance, drama, and a collage-like installation I will be able to explore different ways of interpreting and relaying the text and, eventually, determine which media are best suited for the various segments of the play. Transferring this incredibly intellectual text into a performance piece that utilizes different artistic forms and effectively tells the story will require me to systematically analyze and decipher the play in order to determine when the text best lends itself to a particular medium. Moreover, because Mueller's work is rich with literary, historical, and philosophical references I will be conducting research and preparing written analyses on their function in the text.

Two large themes in my academic career both here at Illinois Wesleyan and in my studies abroad have been performance art and Germanic studies. This project will be an opportunity to synthesize and exercise the various disciplines that I have been working in. It is my hope that this venture will culminate not only in written work, but of greater importance to me, in an artistic presentation that I will share with the Illinois Wesleyan community.

Poster Presentation P78

THE PERCEIVED ATTRACTIVENESS OF ADULT FACIAL PROTOTYPES

Ashley Whittington and Gail Walton*

Psychology Department, Illinois Wesleyan University

The mind creates mental prototypes by blending common features across patterns, in faces these are eyes, nose, mouth, and eyebrows. Past research demonstrated that prototypical faces are rated as more attractive than most individual faces. Symmetry confounds attractiveness ratings because the prototypes are more symmetric than individual faces. In the present study, symmetry was controlled by morphing each individual face with its mirror image to make an individual symmetric face. Adult male and female participants rated the attractiveness of the male and female symmetric individual faces and prototypes composed of 2, 4, 8, and 16 faces. Results indicated that attractiveness ratings increased as the number of faces in the prototype increased; the effect was highly significant, $F(4,104) = 145.241$, $p < .0001$. Since symmetry was controlled in this study and a significant effect was found for the level of the prototype, there must be other factors that contribute to a prototype's attractiveness.

Poster Presentation P79

CATALYTIC REACTIONS OF ALKYNES IN AQUEOUS CONDITIONS

Jason Williams and Eike Bauer*

Chemistry Department, Illinois Wesleyan University

Catalysts are very important in chemistry and industry. They lower energy and monetary costs, time, and temperature of chemical reactions. We have found in literature a way to dimerize (add together) alkynes via aqueous conditions to form enones (a ketone functional group next to a double bond); a catalyst is necessary for this reaction. There is potential for improvement for this type of reaction. The catalytically active species we are studying presently is Rhodium based. Our goal is to investigate ways of increasing the efficiency and selectivity of the catalyst system. The product mixtures are analyzed using Infrared Spectroscopy, Nuclear Magnetic Resonance Spectroscopy, and Gas Chromatography. We hope to find a way to adjust the conditions in such a way to allow the reaction to occur at a lower temperature, shorter time, and/or higher selectivity.

There is potential use for these kinds of reactions in industry, for example pharmacy, since there is a high demand for cost efficient, time-saving, and stereo-specific reactions.

Poster Presentation P80

**THE STRESSORS AND BUFFERING EFFECTS OF BURNOUT IN
DEPARTMENT OF CHILDREN & FAMILY SERVICES CASEWORKERS**

Melanie Winslow and Rebecca Gearhart*
Anthropology Department, Illinois Wesleyan University

This photo ethnography focused upon the stressors that are attributed to burnout as well as the buffering effects that social workers can use to prevent burnout. Two participants were interviewed, J.H. and M.M. from the Department of Children and Family Services (DCFS) in Bloomington, IL. Time was also spent at the department's branch office in Bloomington speaking with other social workers and taking field notes on the day to day activities of the social workers and supervisors at DCFS. After combining the information from each participant, observations, and field notes, the factors effecting burnout were decided. Stressors which are attributed with burnout include: time available, nature of cases, caseload, and the lack of an appropriate number of caseworkers. While on the other hand those effects which seem to buffer burnout include: exercise, support systems within the department, caseworker supervision, smoking, and the knowledge that one is helping children find safe and loving homes. After the stressors and buffers of burnout were identified, photographs were taken as a way to depict and represent these issues. Many caseworkers from DCFS collaborated with me in brainstorming, setting up, and capturing the image desired. In the end, a photo essay was developed which depicts the stressors and buffers of burnout though a balance of text and images. It is hoped that this photo essay can be used as a platform to educate the community in the caring individuals who devote their time and energy to child welfare.

Poster Presentations P82, P84, P86, P88

**SUSAN GLASPELL'S ALISON'S HOUSE:
RESEARCH CHALLENGES AND ISSUES**

Theatre History II and Sara Freeman*
School of Theatre Arts, Illinois Wesleyan University

Susan Glaspell's last, Pulitzer-prize winning play *Alison's House* seems initially to be "the Emily Dickinson play" with its absent title character inspired, as it partly is, by the "myth of Amherst." But researching the play for production requires moving beyond the textual/biographical connection and considering historical, sociological, and emotional factors that make this play a forgotten example of classic American realism on par with the work of Eugene O'Neill. Four examples of research projects undertaken in the spring 2006 Theatre History II class about *Alison's House* will be presented, with topics concerning actress Eva La Gallienne and her Civic Repertory Company, which staged the first production of *Alison's House*, the work of the Provincetown Players, Eugene O'Neill and other writers who were Glaspell's contemporaries, the roles and expectations for 19th century women that shape the attitudes represented in this play, and the historical moment of the turn-of-the century when the play is set.