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Conference

2016, 27th Annual JWP Conference

Apr 16th, 7:30 AM - 8:00 AM

Complete 2016 Program

Illinois Wesleyan University

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Center for Natural Sciences
& The Ames Library

Saturday, April 16,

2016

www.iwu.edu/jwprc

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

Twenty-Seventh Annual
John Wesley Powell • IWU

Student Research Conference

Center for Natural Sciences and State Farm Hall

Saturday, April 16, 2016

Official Program

ACKNOWLEDGEMENTS

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

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

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

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

John Wesley Powell Research Conference Committee:

- David Vayo (Music)
- Crystal Boyce (Ames Library)
- Christopher Callahan (French)
- Daniel Roberts (Mathematics)
- Marina Balina (German, Russian and Asian Languages)
- Michael Seeborg (Economics)
- Marcia Thomas (Ames Library)
- Scott Sheridan (French and Italian Languages and Literatures)

SCHEDULE OF EVENTS

Saturday, April 16, 2016

8:30 a.m.	Continental Breakfast and Poster Setup	Atrium of CNS and State Farm Hall
9:00 a.m.	Poster Session A Poster Presentations – Educational Studies	Atrium of CNS State Farm Hall
10:00 a.m.	<i>Oral Presentations – Session One</i> <i>Oral Presentations – Educational Studies</i>	CNS SFH
11:00 a.m.	<i>Oral Presentations – Session Two</i> Poster Presentations – Educational Studies	CNS SFH
12:00 p.m.	Luncheon Music Composition Performances Keynote Address: Regina Psaki	Young Main Lounge
2:00–3:00 p.m.	Poster Session B	Atrium of CNS
3:00 p.m.	Senior Art Show and Critique	Merwin and Wakeley Galleries

KEYNOTE SPEAKER

“The Boy Who Was a Girl’: Nature, Nurture, and the 13th-century Maiden Knight”

Regina Psaki, Giustina Family Professor of Italian Language and Literature
Department of Romance Languages, University of Oregon

Gina Psaki is the Giustina Family Professor of Italian Language and Literature in the Department of Romance Languages at the University of Oregon. She received her Ph.D. in Medieval Studies at Cornell University in 1989. Professor Psaki has published criticism on and translations of medieval courtly romances in French and Italian, and many articles on Dante, on Boccaccio, and on medieval misogyny. In 2014 she published a collaborative history with Gloria Allaire entitled *The Arthur of the Italians: The Arthurian Legend in Medieval Italian Language and Culture*. Her current project is *The Traffic in Talk About Women: Misogyny and Philogyny in the Middle Ages*, a study of writing in praise and blame of women from the French and Italian Middle Ages.



STUDENT PARTICIPANTS

Oral and Poster Presentations

Lindsey Alpert	O8.4	Constantine Karas	P16
Stephanie AuBuchon	P1	Tess Kelley	P10
Jenna Baker	P2	Jazmyne Kellogg	O3.2
Joseph Bakke	O2.4	Christina Khouri	P18
Victoria Bauer	O9.3	Brook Koebele	P9
Blake Beehler	O6.3	Jessica Kraut	P19
Boryana Borisova	O9.2	Dorota Kulikowska	P20
Seth Borrowman	P3	Nitesh Kumar	P22
Morgan Braun	P4	Julia Lennon	P4
Fiona Breyer	P5	Maxwell Leonard	P23
Abigail Brown	P6	Lunjun Liu	P24
Alexandra Burnside	ES	Justice Macklin	O11.2
Devon Busbia	ES	Amanda Macuiba	O4.2
Briana Carter	ES	Gina Mayer	ES
Cristina Cervantes	O10.2	Lauren McAnally	ES
Ziven Chinburg	O8.1	Stephanie McAtee	O2.1
Nicole Chlebek	O7.3	Grace McCarten	O3.1
Mark Curtis	P7	Elyse McCormick	P25
Analeigh Dao	O4.3	Anna Moczynski	P26
Alyssa Davis	ES	Emma Moris	ES
Lauren Dineen-Griffin	O4.1	Meaghan Mormann	P10
Zhenghao Ding	P8,P24	Sydney Muchnik	P27
Megan Dolan	P4	Alexander Mueller	P28
Hilary Doyle	O9.1	Niccole Nelson	P29
Elena Duve	ES	NgocGiao Nguyen	P30
Addison Ely	P9	Kyle O'Shea	P16
Rachel Ende	P17	Anna Oliveri	ES
Emily Erdmann	P3	Alexandria Paradis	P9
Yizhe Gao	O5.1	Lauren Pavich	ES
Madeline Gibson	P3	Hang Phung	P31
Anel Gonzalez-Ruiz	P11	Kellie Pilalis	ES
Kacie Graves	O7.2	Claudia Quevedo-Garcia	O10.3
Samridh Gupta	P12	Lydia Rudd	O6.2
Melissa Guzman	O1.3	Shaun Schaefer	O11.1
Daniel Hanson	O8.3	Katherine Serrano	O3.3
Lydia Hartlaub	O10.1	Robert Shafer	P4
Jacob Henry	O5.3	Zachary Silver	O11.1
Angela Herrmann	ES	Karen Silverman	P32
Eric Hyla	O2.2	Megan Smeets	P33
Lesly Ingram	P13	Rebekah Smith	ES

THE JOHN WESLEY POWELL STUDENT RESEARCH CONFERENCE - APRIL 2016

Rui Jiang	P14	Ashley Spain	ES
		Tyler Stacey	O2.3

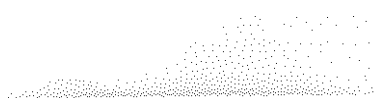
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Stephanie Stahl	ES, O8.2
Roberta Steinert	P28
Brittany Straznickas	P34
Ellen Stumph	P12
Nikhilesh Thapa	P35
Frank Toland	ES
Larissa Valentino	P36
Niyant Vora	P3
Anna Wagner	Music
Daniel Walski	P12
Natalie Weimer	P37
Inez White	P38
Molly Willeford	O1.1
V. Miranda Wilson	ES
Randi Wilson	P22
Jia Yang	O7.1
Maggie Zeisset	O1.2
Yuanziyi Zhang	P39
Wenting Zhao	O6.1
Jinze Zheng	P40, O5.2

DEPARTMENT	STUDENT	TITLE	POSTER	ORAL
ART	Macklin, Justice	"I'm Not The Woman You Think I Am": Reinventing The Black Female Image In Photography		Oral
BIOLOGY	Baker, Jenna	Dendritic Cell Phagocytosis In C57BL/6 IL-10-/- And C57BL/6 Wild Type Mice And Implications For Guillain-Barré Syndrome Pathology	Poster	
	Beehler, Blake	Elucidating A Mechanism Of Growth Cessation In Heterocysts Of Anabaena		Oral
	Borrowman, Seth	Genome Annotation Of 3 New Rhodobacter Capsulatus Bacteriophages	Poster	
	Braun, Morgan	Genetic Analyses And Annotations Of Two Newly Discovered C1 Mycobacteriophages	Poster	
	Brown, Abigail	Expression And Isolation Of The Bche Protein From Dinoroseobacter Shibae In Rhodobacter Capsulatus	Poster	
	Dolan, Megan	Genetic Analyses And Annotations Of Two Newly Discovered C1 Mycobacteriophages	Poster	
	Ely, Addison	Isolation And Characterization Of Six Novel Rhodobacter Capsulatus Bacteriophages	Poster	
	Ende, Rachel	A Transposon Mutagenesis Screen For Heterocyst Production In A Δ Hetp Strain Of The Cyanobacterium Anabaena	Poster	
	Erdmann, Emily	Genome Annotation Of 3 New Rhodobacter Capsulatus Bacteriophages	Poster	
	Gibson, Madeline	Genome Annotation Of 3 New Rhodobacter Capsulatus Bacteriophages	Poster	
	Gupta, Samridh	Isolation And Characterization Of Previously Undiscovered Bacteriophages	Poster	
	Ingram, Lesly	Assessment Of Cranial Neural Crest Proliferation Patterns Between The Redeye Tetra Moenkhausia Sanctaefilomenae And The Zebrafish Danio Rerio	Poster	
	Kelley, Tess	Predicting Incubation Period: A Case Study Of The North Island Brown Kiwi (Apteryx Australis Mantelli) And The Elephant Bird (Aepyornis Spp)	Poster	
	Khoury, Christina	Functional Complementation Of Z-Ring Regulation By Alleles Of Hetp In Anabaena	Poster	
	Koebele, Brook	Isolation And Characterization Of Six Novel Rhodobacter Capsulatus Bacteriophages	Poster	
	Kulikowska, Dorota	Use of a Glutathione S-transferase (GST) tag for isolation of the bchE encoded protein of Rhodobacter capsulatus in Rhodobacter capsulatus	Poster	
	Lennon, Julia	Genetic Analyses And Annotations Of Two Newly Discovered C1 Mycobacteriophages	Poster	

BIOLOGY	McCormick, Elyse	Determining The Viability Of Preserved Cell Suspensions Frozen Over Time With Varied Glycerol Concentrations	Poster
	Mormann, Meaghan	Predicting Incubation Period: A Case Study Of The North Island Brown Kiwi (<i>Apteryx Australis</i> Mantelli) And The Elephant Bird (<i>Aepyornis</i> Spp)	Poster
	Muchnik, Sydney	A New Technique For Imaging Real-Time Cytokine Secretion	Poster
	Paradis, Alexandria	Isolation And Characterization Of Six Novel <i>Rhodobacter Capsulatus</i> Bacteriophages	Poster
	Shafer, Robert	Genetic Analyses And Annotations Of Two Newly Discovered C1 <i>Mycobacteriophages</i>	Poster
	Smeets, Megan	Restoration Of Heterocyst Production To A Δ hetp Strain Of <i>Anabaena</i>	Poster
	Steinert, Roberta	A Survey Of Bird-Window Collisions On The Illinois Wesleyan University Campus	Poster
	Straznickas, Brittany	Phage For Thought: Investigating The Ingestion And Assimilation Of Viruses Into Rotifer (<i>Brachionus Plicatilis</i>) Tissues	Poster
	Stumph, Ellen	Isolation And Characterization Of Previously Undiscovered Bacteriophages	Poster
	Thapa, Nikhilesh	Functional Analysis Of A Putative Homing Endonuclease	Poster
CHEMISTRY	Vora, Niyant	Genome Annotation Of 3 New <i>Rhodobacter Capsulatus</i> Bacteriophages	Poster
	Walski, Daniel	Isolation And Characterization Of Previously Undiscovered Bacteriophages	Poster
	Rudd, Lydia	Instrumentation For Determining Prebiotic Species In The Interstellar Medium	Oral
COMPUTER SCIENCE	Zhao, Wenting	Parallel Infeasibility Analysis	Oral
ECONOMICS	Bakke, Joseph	Foreign Direct Investment And Sovereign Debt In The European Monetary Union	Oral
	Hyla, Eric	The Long-Term Economic Impact Of Juvenile Criminal Activity	Oral
	Leonard, Maxwell	Income Mobility Through Education In The United States	Poster
	McAtee, Stephanie	The Effect Of China's One-Child Policy On Male And Female Chinese Immigrant Earnings: Does It Pay To Be An Only Child	Oral
	Nguyen, NgocGiao	Can The Working Industry Tell About Your Chance Of Getting Health Insurance? A Study On The Health Insurance Coverage Of Working Adults In The U.S.	Poster

EDUCATIONAL STUDIES	Silverman, Karen	Second Generation Immigrants: The Effect Of Parental Nativity Status On Earnings	Poster	
	Stacey, Tyler	Economic Impact And Audience Patronage Studies Of The Illinois Shakespeare Festival		Oral
	Burnside, Alexandra	Implementing Differentiated Mathematics Instruction: A Self-Study	Poster	
	Busbia, Devon	Understanding The Implications And Addressing Defiance In The Classroom	Poster	
	Carter, Briana	Examining Home-Based Child Care		Oral
	Davis, Alyssa	Developing Life Skills In Young Students	Poster	
	Duve, Elena	Enriching The Language Learning Experience Through Technology		Oral
	Herrmann, Angela	Individualizing Behavior Management: Impact On Student Achievement	Poster	
	Mayer, Gina	Inquiry Based Learning: Effects On Student Learning	Poster	
	McAnally, Lauren	Fostering Engagement In A Middle School Classroom	Poster	
	Moris, Emma	Creative Teaching Strategies And Student Learning	Poster	
	Oliveri, Anna	One-To-One Computers In The Classroom: One Size Fits All?	Poster	
	Pavich, Lauren	How Families' Lifestyles Are Impacted When There Is A Child Or Parent With A Cognitive Disability	Poster	
	Pilalis, Kellie	Using Strategies To Promote Students' Critical Thinking Abilities	Poster	
	Smith, Rebekah	Beyond The Literary Canon: Incorporating Young Adult Literature Into The Classroom	Poster	
	Spain, Ashley	Socioeconomic Status And Student Academic Performance	Poster	
	Stahl, Stephanie	Use Of Multimedia In The Classroom And Its Effects On Student Learning		Oral
	Toland, Frank	Making Academic Language Accessible For English Language Learners	Poster	
	Wilson, V. Miranda	The Impact Of A Culturally Relevant Curriculum In A Bilingual Classroom		Oral
ENVIRONMENTAL STUDIES	Chlebek, Nicole	Tracking The Elephant (Lexodonta Africana) Corridor And The Human-Wildlife Conflict In Selela Village		Oral



	Gonzalez-Ruiz, Anel	The Feasibility Of Implementing Sustainable Practices In Mexican Independently Owned Restaurants In Bloomington, Il	Poster
	Mueller, Alexander	A Survey Of Bird-Window Collisions On The Illinois Wesleyan University Campus	Poster
FRENCH & FRANCOPHONE STUDIES GERMAN, RUSSIAN & ASIAN LANGUAGES HISPANIC STUDIES	Bauer, Victoria	Redefining French Women's Identity Through Challenging And Eroding The Napoleonic Code	Oral
	Doyle, Hilary	The Girl With The Dragon Tattoo And The Swedish Guardianship Program	Oral
	Hartlaub, Lydia	Transnational Actors: A Study In International Cinema	Oral
	Quevedo-Garcia, Claudia	The Auxiliary Verb Constructions (Avc) In Spanish	Oral
HISTORY	Alpert, Lindsey	The Legality Of The Cuban Missile Crisis Quarantine	Oral
	Chinburg, Ziven	A Victory In Defeat: Historical Memory, Metanarratives, And The Fate Of Poland In World War Two	Oral
	Hanson, Daniel	Re-Thinking The Thaw: Literature And Reform In The Soviet Union (1950s And 1960s)	Oral
	Stahl, Stephanie	The Evolution Of Zero-Tolerance Policies	Oral
INTERNATIONAL STUDIES	Borisova, Boryana	"Little Brothers" By Agniia Barto: Gender And Ideology In Soviet Era Picture Books, 1920s-1930s	Oral
	Cervantes, Cristina	The Effects Of South Korean Pop Culture On The Country's Standards Of Beauty And Success	Oral
	Graves, Kacie	Unfree Labor In Côte D'ivoire's Cocoa Production: A Comparative Analysis Of The Local Cocoa And Cotton Commodity Chains	Oral
	Yang, Jia	Time To Wake Up: Importance Of Recognizing And Regulating Private Military Forces	Oral
MATHEMATICS	Gao, Yizhe	Multidesigns For A Graph Pair Of Order 6	Oral
	Henry, Jacob	Multidecomposition Of Complete Directed Graphs Into Directed Graph Pairs Of Order 3 And 4	Oral
	Jiang, Rui	Bivariate Barycentric-Coordinate Bernstein-Bezier Polynomial & C1 Quadratic Vertex Spline	Poster
	Jinze, Zheng	Integer Antimagic Labeling For Cycle With One Chord	Poster
	Phung, Hang	C7 And C7 Complement Multidecomposition Of Kn	Poster
	Zhang, Yuangiyi	Generalized Catalan Numbers And Their Properties	Poster
	Zheng, Jinze	Duals Of Bernoulli Numbers And Polynomials And Euler Numbers And Polynomials	Oral
MUSIC	Schaefer, Shaun	Gender Preference For Music Proximity	Oral
	Silver, Zachary	Gender Preference For Music Proximity	Oral

	Wagner, Anna	Little Birds		Music
PHYSICS	Breyer, Fiona	Thermal Modeling Of A Millimeter Wavelength Light Detector	Poster	
	Ding, Zhenghao	Nanovaterite Synthesis And Processing	Poster	
PHYSICS	Karas, Constantine	Design And Engineering Of A Millimeter-Wavelength Spectrometer	Poster	
	Liu, Lunjun	Quantum Optics And Single Photon Quantum Information Processing	Poster	
	O'Shea, Kyle	Design And Engineering Of A Millimeter-Wavelength Spectrometer	Poster	
POLITICAL SCIENCE	Guzman, Melissa	It Takes A Latina Candidate		Oral
	Willeford, Molly	Are Women Winning? Does Descriptive Representation Of Women In Parliament Lead To Woman-Friendly Policy In Sub-Saharan Africa?		Oral
	Zeisset, Maggie	The Happiest Xenophobes On Earth: Examining Anti-Immigrant Sentiments In The Nordic Countries		Oral
PSYCHOLOGY	AuBuchon, Stephanie	Self Control In Dogs	Poster	
	Curtis, Mark	Anatomical Effects Of Exercise Following Ischemic Insult In Young And Aged C57bl/6 Mice	Poster	
	Dao, Analeigh	Emotional And Social Responses To Intact And Degraded Nature: What Does It Mean To Lose The Dark?		Oral
	Kraut, Jessica	Differences In Spatial Cognition In Captive Tiger And Bears	Poster	
	Kumar, Nitesh	Changes In Eeg Brain Activity During Physical And Social Pain Assessment In Chronic Pain Patients Undergoing Spinal Cord Stimulation (Scs) Therapy	Poster	
	Macuiba, Amanda	Effects Of Exercise And Good Limb Training On Functional Outcome Following Stroke In C57bl/6 Mice		Oral
	Moczynski, Anna	The Influence Of Social Exclusion On Self-Regulatory Control: Neuronal And Behavioral Activity Effects During Subsequent Cognitive Tasks	Poster	
	Nelson, Niccole	Stress & Well-Being: The Role Of Social Support Exchanged With Adult Children	Poster	
PSYCHOLOGY	Valentino, Larissa	Anxious Attachment As A Predictor Of Risky Sexual Behavior	Poster	
	Weimer, Natalie	Neural And Behavioral Effects Of Social Exclusion On Self-Regulation	Poster	
	Wilson, Randi	Changes In Eeg Brain Activity During Physical And Social Pain Assessment In Chronic Pain Patients Undergoing Spinal Cord Stimulation (Scs) Therapy	Poster	
SOCIOLOGY	Dineen-Griffin, Lauren	Understanding And Navigating Stigma Around Mental Illness		Oral

Kellogg, Jazmyne	Use And Awareness Of Diverse Curricular Materials At Illinois Wesleyan University	Oral
McCarten, Grace	Cultural Production And Self-Definition: The Impact On Physical Appearance Relative To The Socialization Process	Oral
Serrano, Katherine	Identity Management Among Students Of Color At Iwu	Oral
White, Inez	Exploring Differential Opportunity Among Inner City Black Men	Poster

BA/BFA SENIOR EXHIBITION PRESENTATIONS
SCHOOL OF ART

Saturday, April 16, 2016, 3:00 p.m., Merwin and Wakeley Galleries

Student Presenters:

Ross Knezovich

Justice Macklin

Rachael Schamberger

Refreshments will be served

MUSIC COMPOSITION STUDENT PRESENTATION

Saturday, April 16

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

Little Birds

Annie Wagner '17

Annie Wagner, voice and piano

MUSIC COMPOSITION STUDENT PRESENTATION

Saturday, April 16

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

Little Birds

Annie Wagner '17

Annie Wagner, voice and piano

Music Presentation

LITTLE BIRDS

Anna Wagner and Daniel Swilley*
School of Music, Illinois Wesleyan University

This composition is based upon a poem that I wrote in late 2012, titled *Birds*. This poem was an assignment for a creative writing class, but written for a very personal event. 5-year-old Cecilia, 8-year-old Sophie and 11-year-old Amara, second cousins of mine, were murdered in their home in the summer before this poem was written. I wanted to give a tribute to the girls, and the best way I knew how was with a creative outlet. The poem is short and nondescript, written from the perspective of their mother. Paired with the story, it has a much more powerful impact. For me, it simply hurt too much to write anything more descriptive. The three little birds in my poem are the three little girls. The poem goes, “

Struck down,
her heart

dropped.

They were found,
Three little birds
sitting,
laying,
waiting,

not making a sound.

She refused to
Look, to
believe.

But the clock ticked on. “

Last year, I was looking for poems to transcribe into lyrics for a song for voice and piano. I came across this poem again and expanded it into four verses and one chorus. When I thought and prayed for the girls, I always thought of them as my little birds in the sky. Their mother and other family members decided to call them the tri-angels. In the last verse, I incorporated this name,

“But as little angels they sit now,
at rest upon the low evening sun.”

ORAL PRESENTATIONS - SESSION 1
10:00 – 11:00
CENTER FOR NATURAL SCIENCES (C 102)
Political Science
MODERATOR: Lindsey Alpert

- 1.1 Molly Willeford (Political Science)
- 1.2 Maggie Zeisset (Political Science)
- 1.3 Melissa Guzman (Political Science)

ORAL PRESENTATIONS- SESSION 2
11:00 – 12:00
CENTER FOR NATURAL SCIENCES (C-102)
Economics
MODERATOR: Lu Liao

- 2.1 Stephanie McAtee (Economics)
- 2.2 Eric Hyla (Economics)
- 2.3 Tyler Stacey (Economics)
- 2.4 Joseph Bakke (Economics)

ORAL PRESENTATIONS - SESSION 3
10:00 – 11:00
CENTER FOR NATURAL SCIENCES (E101)
Sociology
MODERATOR: Paige Buschman

- 3.1 Grace McCarten (Sociology)
- 3.2 Jazmyne Kellogg (Sociology)
- 3.3 Katherine Serrano (Sociology)

ORAL PRESENTATIONS - SESSION 4

11:00 – 12:00

CENTER FOR NATURAL SCIENCES (E101)

Sociology and Psychology

MODERATOR: Paige Buschman

- 4.1 Lauren Dineen-Griffin (Sociology)
- 4.2 Amanda Macuiba (Psychology)
- 4.3 Analeigh Dao (Psychology)

ORAL PRESENTATIONS – SESSION 5

10:00 – 11:00

CENTER FOR NATURAL SCIENCES (E103)

Mathematics

MODERATOR: Chudan (“Danny”) Chen

- 5.1 Yizhe Gao (Mathematics)
- 5.2 Jinze Zheng (Mathematics)
- 5.3 Jacob Henry (Mathematics)

ORAL PRESENTATIONS – SESSION 6

11:00 – 12:00

CENTER FOR NATURAL SCIENCES (E103)

Sciences: Computer Science, Chemistry and Biology

MODERATOR: David Esterquest

- 6.1 Wenting Zhao (Computer Science)
- 6.2 Lydia Rudd (Chemistry)
- 6.3 Blake Beehler (Biology)

ORAL PRESENTATIONS – SESSION 7

10:00 – 11:00

CENTER FOR NATURAL SCIENCES (E104)

International Studies and Environmental Studies

MODERATOR: JONAS WIGHTMAN

- 7.1 Jia (Muyi) Yang (International Studies)
- 7.2 Kacie Graves (International Studies)
- 7.3 Nicole Chlebek (Environmental Studies)

ORAL PRESENTATIONS - SESSION 8

11:00 – 12:00

CENTER FOR NATURAL SCIENCES (E104)

History

MODERATOR: Hannah Abrams

- 8.1 Ziven Chinburg (History)
- 8.2 Stephanie Stahl (History)
- 8.3 Daniel Hanson (History)
- 8.4 Lindsey Alpert (History)

ORAL PRESENTATIONS - SESSION 9

10:00 – 11:00

CENTER FOR NATURAL SCIENCES (E102)

Language and Literature

MODERATOR: Daniel Hansen

- 9.1 Hillary Doyle (German/Russian)
- 9.2 Boryana Borisova (International Studies/REES)
- 9.3 Victoria Bauer (French and Francophone Studies)

ORAL PRESENTATIONS – SESSION 10
11:00 – 12:00
CENTER FOR NATURAL SCIENCES (E102)
Humanities Session
MODERATOR: ALINE VALAIS

- 10.1 Lydia Hartlaub (Hispanic Studies)
- 10.2 Cristina Cervantes (International Studies)
- 10.3 Claudia Quevedo-Garcia (Hispanic Studies)

ORAL PRESENTATIONS – SESSION 11
11:00 – 12:00
CENTER FOR NATURAL SCIENCES (E105)
Gender Issues in Music and Photography
MODERATOR: Joey Petrando

- 11.1 Shaun Schaefer and Zachary Silver (School of Music)
- 11.2 Justice Macklin (School of Art)

Presentations are 12-15 minutes in length. If time permits, there will be a question-and-answer period for all presenters following the final presentation.

Oral Presentation O1.1

Are Women Winning? Does Descriptive Representation of Women in Parliament Lead to Woman-Friendly Policy in Sub-Saharan Africa?

Molly Willeford and Kathleen Montgomery*
Political Science Department, Illinois Wesleyan University

Under what conditions will women's presence in elective office promote woman-friendly policies? The research outlined here will examine this question through a comparison of six Sub-Saharan African democracies (Benin, Botswana, Lesotho, Senegal, South Africa and Tanzania). Women have been elected into sub-Saharan African parliaments in record numbers, to descriptive representation, but is this leading to increased substantive representation, or the enactment of policies that focus on and benefit women? Following a Most Similar Systems design, this research develops an original composite scale to measure woman-friendly policy and finds that there is no clear relationship between descriptive and substantive representation. The remainder of the analysis seeks to identify the factors that lead to the breakdown between women's presence and woman-friendly policy. While no relationship between descriptive and substantive representation exists, different institutional and cultural perspectives are at play influencing woman-friendly policy in this region.

Oral Presentation O1.2

**THE HAPPIEST XENOPHOBES ON EARTH: EXAMINING ANTI-
IMMIGRANT SENTIMENTS IN THE NORDIC COUNTRIES**

Maggie Zeisset and Kathleen Montgomery*
Political Science Department, Illinois Wesleyan University

The Nordic countries (Sweden, Denmark, Norway, Finland and Iceland) are widely known as progressive, open and tolerant. However, in recent years these countries have witnessed growing intolerance towards immigrants, particularly Muslims. This intolerance is manifested in violent attacks against foreigners and the rise of far right, exclusionary populist parties. This paper seeks to understand what causes some citizens in these Nordic countries to embrace anti-immigrant xenophobic attitudes and other citizens to, not only reject, but to fight such views.

Oral Presentation O1.1

**ARE WOMEN WINNING? DOES DESCRIPTIVE
REPRESENTATION OF WOMEN IN PARLIAMENT LEAD TO
WOMAN-FRIENDLY POLICY IN SUB-SAHARAN AFRICA?**

Molly Willeford and Kathleen Montgomery*
Political Science Department, Illinois Wesleyan University

Under what conditions will women's presence in elective office promote woman-friendly policies? The research outlined here will examine this question through a comparison of six Sub-Saharan African democracies (Benin, Botswana, Lesotho, Senegal, South Africa and Tanzania). Women have been elected into sub-Saharan African parliaments in record numbers, to descriptive representation, but is this leading to increased substantive representation, or the enactment of policies that focus on and benefit women? Following a Most Similar Systems design, this research develops an original composite scale to measure woman-friendly policy and finds that there is no clear relationship between descriptive and substantive representation. The remainder of the analysis seeks to identify the factors that lead to the breakdown between women's presence and woman-friendly policy. While no relationship between descriptive and substantive representation exists, different institutional and cultural perspectives at play influencing woman-friendly policy in this region.

Oral Presentation O1.3

IT TAKES A LATINA CANDIDATE

Melissa Guzman and Kathleen Montgomery*
Political Science Department, Illinois Wesleyan University

In the United States, women and racial minorities continue to face serious obstacles to entering elected office, particularly above the local level. This has negative consequences for democratic participation and legitimacy and may affect the substantive representation of issues that concern women, particularly women of color. Studies show that eligible women often list the following as deterrents from running for office: low political confidence, perceived risks associated with running, a lack of support, and a lack of interest in running for higher office. Do Latina candidates, as members of an underrepresented gender and a marginalized racial minority, face unique challenges when compared to non-minority women or Latino males? This study builds on the research on women and Latinos in politics and attempts to garner an in-depth understanding of the Latina candidate's experience through interviews with Latina elected officials at various levels of government in Illinois and uses survey responses from Latino men and non-Latina women elected officials in the state for comparison. This study finds that support and recognition from another elected official is crucial in encouraging Latina women to run for office, indicating that political gatekeepers are one of the largest obstacles Latinas face as candidates.

Oral Presentation O2.1

THE EFFECT OF CHINA'S ONE-CHILD POLICY ON MALE AND FEMALE CHINESE IMMIGRANT EARNINGS: DOES IT PAY TO BE AN ONLY CHILD?

Stephanie McAtee and Michael Seeborg*
Economics Department, Illinois Wesleyan University

China's one-child policy is one of the most controversial population control measures implemented in modern society. While most research focuses on the effects this policy has had on China's population size and economic growth, very little research has been dedicated to analyzing how this policy has affected wage differentials between Chinese men and women. Research suggests that the one-child policy redirected more educational resources towards Chinese daughters than in the past. Human capital theory hypothesizes that equalization in educational attainment will correspond to an equalizing in relative earnings. This paper uses a unique sample of male and female Chinese immigrants from the American Community Survey to test the hypothesis that the one-child policy has advanced the relative earnings of Chinese immigrant women in the United States. A difference-in-differences methodology is used to answer two questions: first, to what extent is the one-child policy's positive effect on educational attainment for Chinese women reflected in the immigrant population? Second, if the one-child policy benefited the level of educational attainment for Chinese immigrant women, is this reflected in their wage-earning profile, relative to their Chinese male immigrant counterparts? The findings of this research suggest that Chinese immigrant women born after the one-child policy attain higher levels of education than those born before. The impacts of these findings are not presently reflected in the wage-earning profiles of Chinese female immigrants due to downward biases in wages for those still in school. However, these findings have the potential to positively impact wages of Chinese immigrant women born under the one-child policy as they leave educational institutions and enter the workforce in the near future.

Oral Presentation O2.2

THE LONG-TERM ECONOMIC IMPACT OF JUVENILE CRIMINAL ACTIVITY

Eric Hyla and Michael Seeborg*

Economics Department, Illinois Wesleyan University

When the juvenile penal system is supposed to be focused on rehabilitation, how does committing crimes and being caught as juveniles affect their future economic success? In 2012, the FBI Arrest Statistics reports an estimated 1,319,700 minors were arrested. Since so many youths interact with the criminal system, it is vital for the strength of the workforce and for the quality of life of the minors to ensure that the system is rehabilitative. Using ordinary least squares regressions, I examine data collected from the National Longitudinal Survey of Youth's 1997 cohort, and examine how interactions with the formal juvenile correctional system impacts a youth's future economic success, taken in 2013 and measured by income, average hours worked a year, and whether the participant received any income or wages in the past year. I find being caught for delinquent behavior, and subsequently being arrested, does significantly impact future income but only when education is not controlled for. I then briefly examine the correlation between education and arrests. Finally, I discuss the results and what they say about the juvenile criminal system, and suggest future policy.

Oral Presentation O2.3

ECONOMIC IMPACT AND AUDIENCE PATRONAGE STUDIES OF THE ILLINOIS SHAKESPEARE FESTIVAL

Tyler Stacey and Diego Mendez-Carbajo*
Economics Department, Illinois Wesleyan University

This study has two parts. The first part is aimed at estimating the economic impact that the festival had on the surrounding community. The second part is an analysis of attendance for shows as a function of a series of variables such as type of play, date, weather, and average ticket price. The data used for the impact study were obtained from six years of financial reports and the data used for the audience analysis were obtained from ten years of ticket data. Results for the impact study determined, using regional economic multipliers, that the festival had a significant economic impact on the community, specifically through job creation. Results for the attendance analysis came from linear regression and indicate that the most significant factor explaining attendance was the type of play. The findings of this study could be of use to the marketing and development departments of the festival. Further research would look into the effects of price discrimination and audience preference on the festival's attendance.

Oral Presentation O2.4

FOREIGN DIRECT INVESTMENT AND SOVEREIGN DEBT IN THE EUROPEAN MONETARY UNION

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Economics Department, Illinois Wesleyan University

This paper explores the relationship between sovereign debt accumulation and inflows of Foreign Direct Investment (FDI) across the European Monetary Union (EMU). Using an annual panel data set of the 19 EMU member states during the period 1992 – 2014, OLS panel regressions estimate the correlation between sovereign debt and FDI while controlling for other known determinants of FDI. Nine different explanatory variables are considered controlling for market size, openness, macroeconomic stability, and institutional qualities. Results indicate that sovereign debt growth is consistently negatively correlated with FDI inflows throughout this period. Additionally, debt growth is the only determinant to remain statistically significant across differing OLS methodologies. Considering FDI as a widely accepted contributor to GDP growth, these results support the claim that FDI is one channel by which sovereign debt is a deterrent of economic growth across the EMU.

Oral Presentation O3.1

**CULTURAL PRODUCTION AND SELF-DEFINITION:
THE IMPACT ON PHYSICAL APPEARANCE RELATIVE
TO THE SOCIALIZATION PROCESS**

Grace McCarten and Meghan Burke*
Sociology Department, Illinois Wesleyan University

The seemingly innocuous process of choosing how to express oneself through clothing is significantly influenced by the cultural meanings socialized to everyone. This way that meaning in American culture is produced has a tremendous impact on how individuals self-define and express themselves through clothing and physical appearance. Cultural meaning is produced and perpetuated through the repeated use of specific representations of people, things, and ideas. These representations and meanings are socialized to every member of American society and influence individual identity creation through consumerism in the cultural marketplace. The purpose of this study is to ask why individuals self-define the way they do, what they perceive about the self-definitions of others, and to what extent they are critical or conscious of the larger socialization process taking place. Data was collected through an online survey sent to current students enrolled at Illinois Wesleyan University. Findings explore themes of normative whiteness, colorblind ideology, heteronormativity, and hegemonic effects on identity creation.

Oral Presentation O3.2

USE AND AWARENESS OF DIVERSE CURRICULAR MATERIALS AT ILLINOIS WESLEYAN UNIVERSITY

Jazmyne Kellogg and Meghan Burke*
Sociology Department, Illinois Wesleyan University

This study examines the desires and challenges associated with including greater racial diversity among curricular materials at Illinois Wesleyan University. In this paper I build upon an established model of multicultural curriculum integration in order to stress the importance of inclusive curricular materials. I explore whether or not students of color place a larger emphasis on diversity than their white counterparts in relation to the curriculum. In other words, do they see it as a need or area of improvement? And do they want their curricular materials to reflect their racial identity? I surveyed students in order to gain a better understanding of their perceptions of diversity and inclusion in the classroom and professors in order to understand some of the challenges associated with creating racially diverse curricular materials. I argue that despite these challenges, it remains essential for curricular materials to actively reflect the racial backgrounds of all students in a positive and respectful manner that does not simply serve to uphold systems of oppression, as this is crucial to the academic success of all students.

Oral Presentation O3.3

IDENTITY MANAGEMENT AMONG STUDENTS OF COLOR AT IWU

Katherine Serrano and Meghan Burke*
Sociology Department, Illinois Wesleyan University

College students of color face various obstacles, which are often times emphasized when they are the only student of color in their classrooms or social settings. Students of color at Illinois Wesleyan University make up less than 25% of the student population, and most have experienced microaggressions or other negative responses. Students of color, therefore, may have experienced negative feelings about their identity, which can affect their academic and social success. The study utilizes of interviews with open-ended questions on racial identity and its impact on students of color at Illinois Wesleyan University. The data shows that despite feeling supported by some staff and faculty, most students of color have been affected by microaggressions on and off-campus, and experience feelings of inferiority and exclusion in social settings. Based on these findings, I argue that there should be enhanced efforts to incorporate diversity into the school's curriculum.

Oral Presentation O4.1

UNDERSTANDING AND NAVIGATING STIGMA AROUND MENTAL ILLNESS

Lauren Dineen-Griffin and Meghan Burke*
Sociology Department, Illinois Wesleyan University

Mental illness stigma comes from a misunderstanding about mental health and its origins. This often results in harmful perceptions and stereotypes of those with mental illness. On college campuses, students navigate both mental health issues and the stigmas that surround them. This study uses both survey and interview data to explore student perceptions about mental illness and how students suffering from mental illness deal with stigma as they navigate the institution. Almost 1 in every 3 Illinois Wesleyan students that responded to my study have been diagnosed with a mental illness, yet over 80% of respondents have experienced symptoms. Despite that, there remains a large disconnect between how people think students with mental illness should be treated and how they actually are. A fear of stigma keeps many students quiet about their struggles, leading to more distant and underdeveloped relationships with peers and professors. I explore the implications of these findings as well as coping strategies that students develop in navigating these identities.

Oral Presentation O4.2

**EFFECTS OF EXERCISE AND GOOD LIMB TRAINING ON
FUNCTIONAL OUTCOME FOLLOWING STROKE
IN C57BL/6 MICE**

Amanda Macuiba and Abigail Kerr*

Psychology Department, Illinois Wesleyan University

Stroke is a leading cause of long-term disability, making research on behavioral rehabilitation imperative. A common strategy following stroke is the compensatory use of the less impaired, or good, limb. Compensatory use of the good limb after stroke is efficient and promotes a quick return to independent daily living, but it ultimately negatively impacts overall recovery. We believe exercise may promote better recovery with compensatory limb use. Research shows that exercise promotes neuronal growth and prevents cell death. This study used mice to investigate whether exercise could prevent deterioration the bad limb associated with compensatory training of the good limb. Results showed that exercising mice, with or without good limb training, retained bad limb functionality and have better outcome than mice receiving compensatory training only. These findings suggest that exercise can maintain and extend the recovery potential of the bad limb while permitting compensatory limb use in the short term.

Oral Presentation O4.3

**EMOTIONAL AND SOCIAL RESPONSES TO INTACT AND
DEGRADED NATURE: WHAT DOES IT MEAN TO LOSE THE
DARK?**

Analeigh Dao and Linda Kuncé*

Psychology Department, Illinois Wesleyan University

Based on research documenting benefits of contact with nature on human well-being, and the harm of exposure to environmental degradation, this study aims to explore the effects of stargazing on human psychological reactions. A laboratory-based experimental study was conducted to assess the emotional and social effects of stargazing on humans and how those effects differ when the view of the night sky is degraded rather than intact. All participants watched two slideshows, one of night sky scenes (to mimic stargazing) and one of geometric figures (a control task). Half of the participants were randomly assigned to watch intact versions of the slideshows (i.e., images of dark sky, colored figures) and half were assigned to watch degraded versions (i.e., light polluted sky, black-and-white figures). After each slideshow, participants completed questionnaires about their general emotions, awe experiences, and pro-social responses. Participants reported significantly less stress, more positive mood, and stronger awe experiences after viewing night sky scenes than after viewing geometric figures. In contrast, results for pro-social responses were more mixed. Contrary to hypotheses, the level of degradation had little effect on participants' responses. Results support previous research by affirming the benefits of contact with nature for psychosocial functioning and do so for a less studied yet potentially important human experience: stargazing.

Oral Presentation O5.1

MULTIDESIGNS FOR A GRAPH PAIR OF ORDER 6

Yizhe Gao and Daniel Roberts*

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A (G,H) -multipacking of a complete graph on n vertices is a collection of edge disjoint subgraphs of that complete graph, each isomorphic to G or H with the property that at least one copy of G and at least copy of H is used. Such a multipacking is called a maximum if the number of unused edges is minimum. Last year we worked on multidecompositions of complete graphs into graph pairs of order 6. We extended these results by characterizing the multipackings and mutilcoverings of those complete graphs that do not admit multidecompositions into graph pairs of order 6.

Oral Presentation O5.2

DUALS OF BERNOULLI NUMBERS AND POLYNOMIALS AND EULER NUMBERS AND POLYNOMIALS

Jinze Zheng and Tian-Xiao He*

Mathematics Department, Illinois Wesleyan University

A pair of infinite inverse matrices can define a sequence inverse relationship. If the pair of matrices is the same, they define a dual relationship. Here presented is a unified approach to construct dual relationships via pseudo-involution of Riordan arrays. Then we give four dual relationships for Bernoulli numbers and Euler numbers, from which the corresponding dual sequences of Bernoulli polynomials and Euler polynomials are constructed. Some applications in the construction of identities of Bernoulli numbers and polynomials and Euler numbers and polynomials are discussed based on the dual relationships.

Oral Presentation O5.3

MULTIDECOMPOSITION OF COMPLETE DIRECTED GRAPHS INTO DIRECTED GRAPH PAIRS OF ORDER 3 AND 4

Jacob Henry and Daniel Roberts*
Mathematics Department, Illinois Wesleyan University

A complete directed graph is a directed graph in which every vertex has an in and out arc connecting it to every other vertex. Given two directed graphs D and H , a (D,H) multidecomposition of the complete directed graph is a partition of the edges of the complete directed graph into copies of D and H where at least one copy of D and at least one copy of H is used. By finding a decomposition of a complete directed graph we can decompose larger graphs in order to assign them the properties associated with the graphs they decompose into. This paper shows how to decompose graphing pairs of order 3 and order 4 with pairings of sizes 3,9.

Oral Presentation O6.1

PARALLEL INFEASIBILITY ANALYSIS

Wenting Zhao and Mark Liffiton*

Computer Science Department, Illinois Wesleyan University

In the field of computer science, the constraint satisfaction problem is a commonly studied problem and has a wide range of applications such as microprocessor design verification and scheduling problems. A constraint system is a set of restrictions, known as constraints, that “restrict” the values can be assigned to those variables. For example, imagine scheduling a meeting with your professor: you are available from 7am to 2pm and your professor is available from 1pm to 4pm. This forms a simple constraint system. However, it is not always possible to satisfy all constraints in a constraint system. For example, if your professor is only available from 3pm-4pm, there is not a time that both of you are free. We then call it an infeasible constraint system. In addition to knowing it is infeasible, it is useful to extract more information. What makes it impossible to satisfy? Where are the issues? How could we fix them? In this work, we have improved on an existing algorithm that performs this type of analysis by parallelizing it, adapting it to run on multiple processors simultaneously. That is, within the same amount of time, we can gain more information by running the parallelization of the previous algorithm on a multi-core machine. Our empirical analysis shows the parallelized algorithm scales well, making efficient use of all cores in a system.

Oral Presentation O6.2

INSTRUMENTATION FOR DETERMINING PREBIOTIC SPECIES IN THE INTERSTELLAR MEDIUM

Lydia Rudd, Ben Lamm, Kevin Roenitz and Manori Perera*
Chemistry Department, Illinois Wesleyan University

We are building an instrument to study the gas phase reaction dynamics of astronomically relevant molecular species, specifically the reactions of ions with neutral molecules. With this instrument, we plan to study the branching ratios of product channels under a variety of temperatures, pressures, and external photon energies that adequately simulate the conditions of the interstellar medium (ISM). The data will allow us to (1) identify new species that are stable under ISM conditions and (2) understand the reaction dynamics of ion-neutral reactions since these are known to drive the chemistry of the ISM. The particular ions – such as HCN^+ , HCO^+ and C_3H_3^+ – that we propose to study are important for prebiotic and carbon chemistry in space. The instrument consists of 3 stages: (1) a dual channel ion source (2) a liquid nitrogen cooled ion trap with optional laser and (3) a time-of-flight mass spectrometer. The progress of the instrument will be presented.

Oral Presentation O6.3

**ELUCIDATING A MECHANISM OF GROWTH CESSATION
IN HETEROCYSTS OF *ANABAENA***

Blake Beehler and Loralyn Cozy*
Biology Department, Illinois Wesleyan University

Anabaena sp. strain PCC 7120 is a filamentous, multicellular cyanobacterium that serves as a model for the study of terminal cell type differentiation. When starved for bioavailable nitrogen, a subset of cells in a filament terminally differentiate into a nitrogen-fixing cell type, called a heterocyst. To maintain their position in the growing filament, heterocysts lose the ability to divide. This cell-type specific cessation of division suggests that there is a regulatory link between binary fission and heterocyst differentiation. It is unknown how cell division is inhibited in heterocysts, but it has been shown that heterocysts lack polymerized FtsZ rings (Z-rings) normally responsible for cytokinesis. Here, we find that a strain of *Anabaena* mutant for the *hetP* gene exhibited Z rings in heterocysts. This indicates that the *hetP* gene may directly or indirectly inhibit Z ring formation in heterocysts, thus preventing division. To test these two possibilities, the interactions between HetP and FtsZ were qualitatively and quantitatively assessed through a bacterial two-hybrid system and β -galactosidase assay, and a potential model relating the action of HetP and FtsZ was developed.

Oral Presentation O7.1

**TIME TO WAKE UP: IMPORTANCE OF RECOGNIZING AND
REGULATING PRIVATE MILITARY FORCES**

Jia Yang and Michael Weis*

International Studies Program, Illinois Wesleyan University

Contracted soldiers have been fighting for U.S. since American Revolution. However, compared to 10% they accounted for the entire military force during World War II, they occupied nearly 50% of entire American military force in places like Iraq. In 2010, among 38,200 military workforce, 207,000—more than 50%—of them are contracted forces. In dealing with Somalia piracy, the private security companies have proved to be so effective that even the International Maritime Organization has issued guidance about hiring private military companies on board for security. However, private military and privatization of armed forces still trigger great concern, sometimes outright protests, against them. With situations in Syria, Iraq, and other places I illustrate that, against the backdrop of new forms of global security threats, it is more important to recognize and harness the power of private forces rather than simply conclude the necessity of utterly banning them.

Oral Presentation O7.2

**UNFREE LABOR IN CÔTE D'IVOIRE'S
COCOA PRODUCTION: A COMPARATIVE ANALYSIS OF
THE LOCAL COCOA AND COTTON
COMMODITY CHAINS**

Kacie Graves and William Munro*
International Studies Program, Illinois Wesleyan University

The Department of Labor's, "List of Goods Produced by Child or Forced Labor," reports forced and child labor in the production of cocoa, but not cotton, even though accounts of labor exploitation on cotton farms are widely documented across the globe. Scholars have determined the wider macroeconomic causations of labor exploitation in the Ivorian cocoa sector by attributing liberalization, market reformation, and increasing concentration to farmer marginalization. However, limited research examines how the local structure and governance of these supply chains contribute to un-free labor practices. Utilizing the framework of commodity chain research, this study employs a comparative analysis of the two supply chains strictly within Côte d'Ivoire to identify why forms of slavery exist in the cocoa production, but not cotton, though both are rooted in the same country. I conclude by explaining who wields power in these supply chains and how this power is formed, distributed, and combated.

Oral Presentation O7.3

**TRACKING THE ELEPHANT (*LEXODONTA AFRICANA*)
CORRIDOR AND THE HUMAN-WILDLIFE CONFLICT
IN SELELA VILLAGE**

Nicole Chlebek and Given Harper*

Environmental Studies Program, Illinois Wesleyan University

The beastly journey of long-distance migration for the African Elephant (*Lexodonta Africana*) is important for upholding their connections between diminishing protected areas in northeastern Tanzania. Human development is encroaching into these migratory corridors which can negatively affect both humans and elephants. This study focused on exploring the hypothesized human-elephant conflict on the Selela corridor, specifically through opportunistic interviews in Selela village, as well as GPS mapping evidence (dung, tracks, browsing, scratching, and wallowing) of elephant travel along the projected corridor connecting Ngorongoro Conservation Area (NCA), through Selela Forest Reserve (SFR), to Manyara Ranch. We support our hypothesis that elephants currently travel during the rainy season from NCA to SFR and from Manyara Ranch to Losimangori Mountains (LM), and possibly from LM to SFR, but there was not enough elephant evidence to confirm this. There is problematic human-elephant conflict in Selela village, where elephants kill humans and destroy farmland. Elephants might travel to the SFR to escape ants in NCA, eat crops, and for high phosphorous levels in SFR for lactating females. We hope that this study can be used to help conserve this vital elephant corridor and assist in resolving the human-elephant conflict in Selela village in the wake of increasing human development.

Oral Presentation O8.1

**A VICTORY IN DEFEAT: HISTORICAL MEMORY,
METANARRATIVES, AND THE FATE OF POLAND
IN WORLD WAR TWO**

Ziven Chinburg and Gordon Horwitz*
History Department, Illinois Wesleyan University

This paper explores the fate of Poland during and immediately after the Second World War. The paper examines the question of Western betrayal of Poland. Why some Poles felt, and continue to feel, a sense of betrayal by their allies during the war is examined. How the Poles came to understand their fate and position in the world during and after World War Two is examined. The Warsaw Uprising is taken as a case study for the Polish experience of World War Two. The degree of Allied support and intervention is discussed, along with the failures of the Polish Government-in-Exile and the Polish Home Army. The culpability of all Allied parties for the failure of the Warsaw Uprising is determined. The metanarratives of victimhood, martyrdom, and betrayal in Polish history are discussed. The Partitions of Poland, Poland's occupation during the 19th century, and Poland's experience in World War Two are examined in regard to their creation of a national Polish narrative. This narrative is defined as glorious victimhood.

Oral Presentation O8.2

THE EVOLUTION OF ZERO-TOLERANCE POLICIES

Stephanie Stahl and Michael Weis*
History Department, Illinois Wesleyan University

Zero-tolerance policies generally have a negative image in general society in the United States. These policies have undergone several revisions since they were first implemented in the late 1980s. Originally, zero-tolerance policies were created to punish offenses including firearms brought to school, but now have been extended to include disobedience and obscene language. This article explains why zero-tolerance policies have altered so drastically in recent history. The Columbine shootings in 1999 created a wide spread fear that place pressure on school administration to alter school anti-violence policies and procedures. These new codes had the intention of creating positive and safe learning environments, but actually limited students' rights in schools and pushed many students into the school-to-prison-pipeline.

Oral Presentation O8.3

**RE-THINKING THE THAW: LITERATURE AND REFORM IN THE
SOVIET UNION (1950S AND 1960S)**

Daniel Hanson and Michael Weis*
History Department, Illinois Wesleyan University

The Thaw, the period of Soviet history immediately following the death of Joseph Stalin in 1953, was a fascinating time for culture and government. Until recently, there has not been significant scholarly attention devoted to this period in cultural history. A new examination of memoirs from writers, dissidents, and Party leaders shows that this period was much more complex than some historians previously thought. The Thaw was neither a true liberalization nor was it a government-facilitated catharsis for the Russian Intelligentsia. Instead, it witnessed the re-emergence of a number of ideologies, each of which proposed a different way forward. However, these competing philosophies were all marked by a distinctly Russian view of the world, a view marked by binary opposition, disavowal of the recent past, and belief that a glorious future awaits. Using memoirs and literature from this period, this project will examine the changes in the Soviet Union in light of this cultural phenomenon.

Oral Presentation O8.4

THE LEGALITY OF THE CUBAN MISSILE CRISIS QUARANTINE

Lindsey Alpert and Michael Weis*
History Department, Illinois Wesleyan University

In October 1962, U.S. aerial surveillance over Cuba triggered a diplomatic crisis with the Soviet Union. U.S. leaders scrambled to come up with a solution to prevent a possible attack with as little provocation as possible. The U.S. ultimately decided to implement a naval “quarantine” on Soviet ships. However, one question remained: was it legal? Scholars in opposition called on international law citing freedom of the seas and aggressive unilateral action. Those in favor remarked that the United States had a right to self-defense and to maintain hemispheric peace and security. While debate still ensues, a majority of the academic community in history and law generally accept the actions as conforming to international law.

Oral Presentation O9.1

THE GIRL WITH THE DRAGON TATTOO AND THE SWEDISH GUARDIANSHIP PROGRAM

Hilary Doyle and Adam Woodis*

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Governments implement a variety of economic and social program in an attempt to ensure a reasonably high standard of living for the majority of its citizens, as well as to help those for whom independent living is not possible without some form of assistance. In Sweden, one such program utilizes a tiered guardianship system in order to support those citizens who are considered to be vulnerable adults due to an inability to care for themselves. These vulnerable adults are appointed a guardian who helps ensure that the recipient is able to accomplish the tasks that are required to be a functioning member of society. The level and duration of the supervision over an individual in the guardianship program is determined on a case-by-case basis by the Swedish courts. While the system is beneficial in theory, research has shown that there is much room for improvement. The Swedish guardianship program was made famous with the publication of Stieg Larsson's *The Girl with the Dragon Tattoo*. My research draws on examples from this novel, specifically Lisbeth Salander's experience within the guardianship program, and connects these to current research to critique and point out flaws present in the Swedish guardianship system.

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Oral Presentation O9.2

**“LITTLE BROTHERS” BY AGNIIA BARTO: GENDER AND
IDEOLOGY IN SOVIET ERA PICTURE BOOKS, 1920s-1930s**

Boryana Borisova and Marina Balina*

International Studies Program, Illinois Wesleyan University

In the early 1920s, Soviet children's literature was to provide the blueprint for becoming model citizens of this newly formed society. It became the precursor to the new two-fold ideological discourse: depicting life of Soviet children as paradise, while condemning children's hardship and exploitation of their less fortunate counterparts abroad. Such educational and ideological tendencies are prominent in Agniia Barto's poem, "Little Brothers" (1928), as it visually and textually represented the theme of internationalism, which was to nurture and shape a feeling of unity in struggle, as well as compassion toward the fates of foreign children. I will explore the existing imbalance between the verbal and visual messages and demonstrate how the attention of a young reader was constantly shifted from the ideologically correct verbal message to the engaging exotic picture of foreign surroundings, thus subordinating ideology to the entertainment value of these books.

Oral Presentation O9.3

REDEFINING FRENCH WOMEN'S IDENTITY THROUGH CHALLENGING AND ERODING THE NAPOLEONIC CODE

Victoria Bauer and James Matthews*

French and Italian Languages and Literatures Department, Illinois Wesleyan University

After the French Revolution, newly self-appointed emperor Napoleon Bonaparte created Le Code Civil, or the Napoleonic Code. Such code outlines a new French Society with the foundation as the French family. Such code promoted order and chauvinist social norms, therefore oppressing French Women. After the implementation of this code, there were more governmental changes that provoked the rise of women's groups in the Third Republic and the important participation of women in the French Resistance during World War 2. These women challenged and resisted their societal role (as defined by the Code) causing the Code to slowly erode over time. Due to the previous sexist nationalistic ideals of France as stated in the Napoleonic Code, the identity of the French woman (defined by those nationalistic claims) was challenged by the efforts of women in the 3rd Republic and by women in the French Resistance during World War 2.

Oral Presentation O10.1

**TRANSNATIONAL ACTORS: A STUDY IN
INTERNATIONAL CINEMA**

Lydia Hartlaub and Carmela Ferradans*

Hispanic Studies Department, Illinois Wesleyan University

In a world that devotes much attention to on-screen entertainment, film actors provide a great deal of cultural significance. There are a number of prominent actors who were born in Spanish-speaking countries that have achieved iconic status in Hollywood, but few native-born American actors who act in other languages. In this study, I examine the reasons behind the success of these transnational Hispanic actors, finding that most of them started their careers in their native countries with highly sexualized roles before acting in the United States. I believe that these eroticized beginnings attracted Hollywood to these actors, so that they could be used as sex icons that satisfyingly embody the exotic “other” for American audiences. In my paper, I look at the actors Diego Luna, Penelope Cruz, Antonio Banderas, Javier Bardem, and Gael Garcia Bernal, analyzing certain films with an eye to how their characters are ethnically and sexually portrayed.

Oral Presentation O10.2

THE EFFECTS OF SOUTH KOREAN POP CULTURE ON THE COUNTRY'S STANDARDS OF BEAUTY AND SUCCESS

Cristina Cervantes and Charles Springwood*

International Studies Department, Illinois Wesleyan University

As a reaction to a very biased Hollywood, South Korean entertainment industries decided to make a “Korean Hollywood” of their own, consisting of Korean pop music (K-Pop) and Korean dramas (K-Dramas), and called it Hallyu (한류), which translates to "the flow and spread of Korea", also referred to as “The Korean Wave” in English. As Hallyu increased in popularity, so did the material pressure for the idols and actors to look good for the camera, since appearance plays a large role in their popularity and success. Thus, many Korean celebrities became the “pioneers” in undergoing plastic surgery in South Korea. South Korean entertainment medias used these celebrities and their strong influence to set a new beauty standard and send the message that having good looks can play a large factor into how successful one can be. Since technology, entertainment, and advertising campaigns have become intertwined with everyday life, especially in urban areas, these messages quickly spread, resulting in an increase in plastic surgery among the everyday people. While South Korea is considered to be a materialistically high context culture, meaning image matters more than the description, it is also contradictorily a collective yet highly competitive society with the idea of belonging in a group yet standing out to be on top of others. Therefore, the culture has become a liaison between entertainment media and the plastic surgery phenomenon in South Korea as the media sets an idea in motion, the culture supports it, and the people accept it.

Oral Presentation O10.3

THE AUXILIARY VERB CONSTRUCTIONS (AVC) IN SPANISH

Claudia Quevedo-García and Christina Isabelli*
Hispanic Studies Department, Illinois Wesleyan University

The Auxiliary Verb Constructions (AVC) in Spanish are composed of an auxiliary verb (a verb used in forming the tenses, moods, and voices of other verbs) that provides the grammatical meaning and a main verb that provides the semantic meaning. Traditionally, AVCs have been divided into two semantic groups: modal and aspectual. Although research has shown no disagreement regarding the modal AVCs in terms of their semantic classification, there does exist debate on the semantic classification of aspectual AVCs. Some literature argues that all AVCs are strictly divided into modal and aspectual, whereas others argue that some of the traditional aspectual AVCs cannot be classified as such. This study aims to discuss whether this group of traditionally classified as aspectual AVCs can be considered *de factum* aspectual and to explore a new semantic classification system.

Oral Presentation O11.1

GENDER PREFERENCE FOR MUSIC PROXIMITY

Zachary Silver and Shaun Schaefers and Joseph Plazak*
School of Music, Illinois Wesleyan University

Musical tastes may span many miles and over many geographical regions, yet listeners seem to reserve a special place for local music. Music preferences are complex and influenced by a variety of musical and extramusical factors, of which “locality” is only one. Determining the role of “locality” in the development of musical preferences is difficult in that such studies must collect data from a wide range of geographical locations, and until recently, studies of this nature were both time-consuming and expensive.

Within this proposed presentation, we will focus on two important aspects of our research on local music. The first aspect pertains to methodology. We believe that many musicologists, especially those working without large research budgets, would benefit from a demonstration of our data collection process via Amazon’s mechanical Turk worker database. The second aspect of our presentation pertains to our preliminary results, which suggest that valuations of local music are complex and multifaceted. In particular, our findings suggest that gender differences may play a pivotal role in understanding valuations of local music. As part of our proposed presentation, we wish to highlight this role of gender, as well as several other main factors, that seem to influence the ways in which listeners value local music. In general, this research provides a novel perspective on the many values that we attach to our everyday music listening and music making, especially music that “hits close to home.”

Oral Presentation O11.2

**“I’M NOT THE WOMAN YOU THINK I AM”:
REINVENTING THE BLACK FEMALE IMAGE
IN PHOTOGRAPHY**

Justice Macklin and Kristine Nielsen*
School of Art, Illinois Wesleyan University

Historically, non-black artists have represented the African/-American female in a way that focuses on her physical and cultural differences to build a stereotypical view of the black woman. Leading black female photographers Carrie Mae Weems, Lorna Simpson, and Mickalene Thomas all create photographs that offer updated models of representation. These portraits deny the use of the black female image simply as an object onto which one can project one’s own ideas. Each artist portrays the model from a more subjective view, focusing on her desires, opinions, and fears. These motives relate directly to the artist’s sense of what it means to be a black woman in contemporary society. In examining these photographic works, I compare their objectives with feminist social movements occurring today to reassert the necessity of a black feminist practice in engaging the fight for beauty.

POSTER SESSION A

9:00 - 10:00 a.m.

Odd-Numbered Posters

POSTER SESSION B

2:00 – 3:00 p.m.

Even-Numbered Posters

**EDUCATIONAL STUDIES ORAL AND POSTER PRESENTATIONS
- ES**

State Farm Hall

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

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

Please remove your posters from CNS Atrium by 3:30 p.m.

Poster Presentation P1

SELF CONTROL IN DOGS

Stephanie AuBuchon and Ellen Furlong*

Psychology Department, Illinois Wesleyan University

We explored self-control in dogs to determine whether (a) individual differences exist and (b) self-control predicts behavioral outcomes. We adapted methods from Bramlett and colleagues (2012) work with capuchin monkeys and created a self-control task to test dogs' self-control--a wheel spins, bringing food close to a window where the dog can access it. A less preferred reward approaches the window before a preferred reward. If dogs eat the first reward the wheel stops spinning and they cannot access the preferred food. However, if they allow the less preferred reward to pass they can access the preferred food. While most dogs readily wait for the more-preferred treat and let the less-preferred treat pass, there are limitations to dog self-control: dogs do not allow immediate preferred treat to pass in order to receive 4 or even 8 of the same preferred treat later. Further, owner self-reports of dog behavior relate to dogs' abilities to wait for the preferred treat -- dogs whose owners report more behavior problems perform worse on the self-control task. Thus, dogs, like humans, have self-control, and the amount of self-control is limited and varies between each individual dog. Finally, preliminary evidence suggests that self-control may be related to behavioral outcomes in dogs that could predict significant outcomes such as whether the dog will be surrendered to a shelter and/or euthanized.

Poster Presentation P2

**DENDRITIC CELL PHAGOCYTOSIS IN C57BL/6 IL-10^{-/-} AND
C57BL/6 WILD TYPE MICE AND IMPLICATIONS FOR
GUILLAIN-BARRÉ SYNDROME PATHOLOGY**

Jenna Baker and Brian Walter* and Linda Mansfield**

*Psychology Department, Illinois Wesleyan University

**Large Animal Clinical Sciences, Michigan State University

Guillain-Barré Syndrome (GBS) is a polyneuropathy affecting the peripheral nervous system, characterized by high anti-ganglioside autoantibodies and nerve lesions, that occurs after exposure to an infectious agent, such as the bacterium *Campylobacter jejuni* (*C. jejuni*). *C. jejuni* 11168 is capable of colonizing the gastrointestinal tracts of interleukin (IL)-10-deficient C57BL/6 mice and C57BL/6 wild type mice. We hypothesized that dendritic cells (DCs) from C57BL/6 IL-10^{-/-} mice have a greater ability to adequately phagocytize the bacteria for elimination in the context of the innate immune response and antigen presentation in an adaptive immune response. We tested this hypothesis by comparing the function of dendritic cells from C57BL/6 IL-10^{-/-} mice and C57BL/6 wild type mice when infected with *C. jejuni* (11168). Dendritic cells were obtained by treating harvested bone marrow stem cells with rmGM-CSF, a cytokine that causes the bone marrow cells to differentiate into dendritic cells. A gentamicin killing assay was then performed to determine the extent of bacterial internalization by the dendritic cells, an essential step for the innate immune response, antigen-presenting functionality, and T-cell and B-cell activation. Further studies will be needed to elucidate the mechanisms of how the immune system response to this bacterium results in the autoimmune reaction cause GBS pathology.

Poster Presentation P3

GENOME ANNOTATION OF 3 NEW *RHODOBACTER CAPSULATUS* BACTERIOPHAGES

Seth Borrowman, Niyant Vora, Emily Erdmann, Madeline Gibson and Richard Alvey*
Biology Department, Illinois Wesleyan University

In the past several years, bacteriophage research has accelerated. Despite these recent advances, relatively few bacteriophages that infect *Rhodobacter capsulatus* are currently known. Six new phages that infect *R. capsulatus* were discovered and isolated, and three of them (McDreamy, Dormio, and Tiptonus) were classified using information from host-range testing and genomic data. McDreamy and Tiptonus were discovered in the Bloomington-Normal area, and Dormio was found in the Chicago area. Purified DNA of all three phages was sent to the University of Pittsburgh to be sequenced. When the sequence files returned, they were annotated using bioinformatic resources. In order to analyze the genes of the three sequenced phages, their genomic data was compared to past data found for other *R. capsulatus* bacteriophages. The phages currently known to infect this bacterium are grouped into 3 clusters; these clusters have genome sizes averaging 39,072 base pairs. Our research shows that McDreamy and Tiptonus may represent two previously uncharacterized clusters of phages. Both have a genome size significantly greater than any previously discovered *R. capsulatus* phages. Dormio is believed to represent a group that previously had only one member. The annotations of all three genomes will be sent to the GenBank database upon completion.

Poster Presentation P4

GENETIC ANALYSES AND ANNOTATIONS OF TWO NEWLY DISCOVERED C1 MYCOBACTERIOPHAGES

Robert Shafer, Julia Lennon, Megan Dolan, Morgan Braun and Richard Alvey*
Biology Department, Illinois Wesleyan University

While viruses, specifically bacteriophages, are some of the most diverse and abundant organisms on the planet, there is still a lot of unknown information about them. This research project aims at gaining an understanding of the genetic components of viruses. Of the sixteen bacteriophages isolated from soil samples, two in particular showed promising signs of intrigue and novelty. DNA from phages Yucca and Erdmann was sent to the University of Pittsburgh for sequencing. Both were classified as C1 cluster phages, which are known for having long sequences, averaging about 155,000 base pairs. Yucca and Erdmann were strikingly similar to each other and to two phages found in nearby locations by previous IWU SEA Lab students five years ago. In order to decipher and annotate the genome, various bioinformatics programs were utilized. These programs were crucial in determining the location and number of genes in addition to their potential functions. Our annotations revealed a few new genes but the majority of the genes had no known function. The completed annotation of both genomes will be submitted to the GenBank database for further analysis.

Poster Presentation P5

THERMAL MODELING OF A MILLIMETER WAVELENGTH LIGHT DETECTOR

Fiona Breyer and Thushara Perera*

Physics Department, Illinois Wesleyan University

The overall goal of this research is to study the emission and absorption of millimeter-wavelength light by samples of cosmic dust analogs at astronomically interesting temperatures (5-50 Kelvin). During the first two cooldowns of a newly refurbished cryostat (refrigerator), we successfully reached an internal temperature of 4 Kelvin. We used this opportunity to obtain preliminary data on the bolometer, a millimeter-wavelength light detector. The information we obtained serves as a calibration of the bolometer and will be useful for interpreting data on cosmic dust samples which will be taken in the future. Using the acquired data, a thermal model of the bolometer was created. Using a separate data set, we were able to perform limited tests on this thermal model. Presented here is how we arrived at the bolometer thermal model and how we have tested it thus far.

Poster Presentation P6

**EXPRESSION AND ISOLATION OF THE BCHE PROTEIN FROM
DINOROSEOBACTER SHIBAE IN *RHODOBACTER CAPSULATUS***

Abigail Brown and David Bollivar*

Biology Department, Illinois Wesleyan University

Photosynthetic bacteria rely on photosynthesis to get energy. Bacteriochlorophylls harvest the light energy in photosynthesis and are important to these bacteria, but several enzymes used to synthesize this macromolecule are not completely understood. The gene *bchE*, from the marine bacterium *Dinoroseobacter shibae*, has been proposed to code for a protein used to help catalyze the formation of the bacteriochlorophyll structure. Isolation of polypeptide encoded by the *bchE* gene was performed to better understand this enzyme. Using conjugation, ST18 *E. coli* cells with plasmids containing the *bchE* gene were mated with a *Rhodobacter capsulatus* strain lacking functional BchE to allow expression. The Brp4 strains containing plasmids were grown to produce the BchE protein. GST tag column chromatography was used to isolate the BchE protein and associated proteins. Protein gel electrophoresis and Western blot techniques were used to ensure that the protein had been expressed in and isolated from the *Rhodobacter capsulatus* strain. The use of a photosynthetic bacterial host to express proteins is a new approach and will hopefully allow identification of proteins that interact with the BchE polypeptide.

Poster Presentation P7

ANATOMICAL EFFECTS OF EXERCISE FOLLOWING ISCHEMIC INSULT IN YOUNG AND AGED C57BL/6 MICE

Mark Curtis and Abigail Kerr*

Psychology Department, Illinois Wesleyan University

Stroke is a leading cause of long-term disability. Current rehabilitative strategies are expensive and often fail to yield complete recovery. Focused training of the impaired limb improves outcome in rodents, but these strategies require intensive training that is not feasible for humans. Because aerobic exercise has been found to induce beneficial changes in the brain, it is a promising rehabilitative strategy following stroke. Exercise may require less intensity and is less expensive than traditional therapy. The current study investigated the effect of post-stroke exercise on young and aged mice. Mice were trained on a skilled reaching task before receiving a focal ischemic stroke. Mice were subdivided into three different groups for rehabilitative training: traditional rehabilitation, aerobic exercise, and control procedures. Both young and aged mice benefited from aerobic exercise after stroke. Aerobic exercise may be an affordable and effective alternative to traditional rehabilitative strategies. Underlying anatomical mechanisms are currently being analyzed.

Poster Presentation P8

NANOVATERITE SYNTHESIS AND PROCESSING

Zhenghao Ding and Timothy Rettich* and Gabriel Spalding*
Physics Department, Illinois Wesleyan University

Our collaborator, Dr. Nick Vamivakas of the University of Rochester, aims to create a *Schrödinger Cat* state in a system containing a large number of atoms, by optically trapping a sample and cooling it to near the quantum ground state. In order to decouple from room temperature chamber walls, the space surrounding the suspended sample must be evacuated. Early experiments, though promising, have not been able to maintain trapping to sufficiently low pressures. We have suggested coating the samples with a birefringent material and using optical torques to achieve gyroscopic stabilization within the trap. As a first step, we are studying nanoscale synthesis of spherical vaterite particles, *e.g.*, the relationship between size of vaterite and reaction time. The advantage of a spherical morphology is that hydrodynamic drag may be analytically calculated.

Poster Presentation P9

**ISOLATION AND CHARACTERIZATION OF SIX NOVEL
RHODOBACTER CAPSULATUS BACTERIOPHAGES**

Addison Ely, Alexandria Paradis, Brook Koebele, and Richard Alvey*

Biology Department, Illinois Wesleyan University

Rhodobacter capsulatus is a photosynthetic bacterium that is used frequently as a model system in studying the genetics of photosynthesis, but historically has not been used in bacteriophage studies. In order to broaden our knowledge of phages that infect *R. capsulatus* six new bacteriophages were isolated, expanding the total number of RC-bacteriophages to twelve. Although these new phages were found in various but similar freshwater environments, each displayed unique characteristics. These included plaque morphology, host range infectivity, and immunity. After isolation and purification of the bacteriophages, DNA was obtained from three, and sent to North Carolina State University for sequencing.

Poster Presentation P10

**PREDICTING INCUBATION PERIOD: A CASE STUDY OF THE
NORTH ISLAND BROWN KIWI (*APTERYX AUSTRALIS*
MANTELLI) AND THE ELEPHANT BIRD (*AEPYORNIS* SPP)**

Meaghan Mormann, Tess Kelley, Jennifer Altman and
William Jaeckle* and Given Harper*
Biology Department, Illinois Wesleyan University

Avian embryonic development requires gas exchange through eggshell pores between the embryo and the external environment. In most studies rates of gas exchange have been predicted based upon measurements of external eggshell pore diameters. However, pore diameters can vary throughout the eggshell and gas exchange is limited by the minimum pore diameter. In this study, polyurethane casts were made of eggshell pores from two closely related species: the extant North Island Brown Kiwi (*Apteryx australis mantelli*) and the extinct Elephant Bird (*Aepyornis* spp). We compared estimates of gas conductance and egg incubation periods based on measurements of the external and minimum pore diameters as determined from images of casts for both species. Based on average estimates of gas conductance from the external and minimum pore diameters, we calculated the Kiwi incubation period as 21 and 77 days, respectively. The incubation period based on the minimum pore diameter is within the known range of incubation periods (75 ± 5 days) for this species. This method will allow us to estimate the incubation period for Elephant bird eggs.

Poster Presentation P11

**THE FEASIBILITY OF IMPLEMENTING SUSTAINABLE
PRACTICES IN MEXICAN INDEPENDENTLY-OWNED
RESTAURANTS IN BLOOMINGTON, IL**

Anel Gonzalez-Ruiz and Abigail Jahiel*

Environmental Studies Department, Illinois Wesleyan University

Businesses are seeing competitive and financial advantages when directing their attention towards environmental sustainability. The purpose of this study was to assess the benefits for restaurants to participate in environmentally friendly practices. This research also looked at independently-owned Mexican restaurants in Bloomington, IL to understand what they are doing towards implementing environmentally friendly practices or in what areas they could improve their practices to become a “green” restaurant. Interviews were conducted with three owners of independently-owned Mexican restaurants in the community. The purpose of the interviews was to inquire about the owners’ beliefs about sustainable business practices, and what they are currently doing to be environmentally friendly. A survey of restaurant customers at two of the three restaurants studied was used to assess whether patrons care about environmental sustainability within the restaurants, ascertain what practices patrons would like to see implemented, and identify the eco-conscious consumer. In the end, the owners were provided with several recommendations based on the interview and survey results.

Poster Presentation P12

ISOLATION AND CHARACTERIZATION OF PREVIOUSLY UNDISCOVERED BACTERIOPHAGES

Ellen Stumph, Daniel Walski, Samridh Gupta and Richard Alvey*
Biology Department, Illinois Wesleyan University

While bacteriophages are extremely abundant with 10^{31} phages estimated in the world, there is much to be discovered. SEA PHAGES students working in the 2015-2016 school year aimed their study on identifying novel bacteriophages. Phages that infect *Mycobacterium smegmatis*, *Rhodobacter capsulatus* and a contaminating bacteria of the Bacillus genus were isolated and characterized; sixteen *M. smegmatis*, one Bacillus, and six *R. capsulatus* phages. The sixteen *M. smegmatis* phages were isolated from soil samples, while the the Bacillus and *R. capsulatus* phages were isolated from fresh water samples. The majority of these were discovered from central Illinois. Relatedness of these viruses was determined by lab analyses such as, immunity testing, plaque morphology, and DNA restriction enzyme analysis. Following the in-lab work, two *M. smegmatis* phages and three *R. capsulatus* were selected to have their genomes sequenced and were further studied.

Poster Presentation P13

ASSESSMENT OF CRANIAL NEURAL CREST PROLIFERATION PATTERNS BETWEEN THE REDEYE TETRA *MOENKHAUSIA SANCTAEFILOMENAE* AND THE ZEBRAFISH *DANIO RERIO*

Lesly Ingram and Brian Walter*
Biology Department, Illinois Wesleyan University

Among teleost fishes, there is a substantial amount of diversity regarding craniofacial morphology. This study investigated the cellular processes directing the morphological variations observed in the Meckel's and ceratohyal cartilages of the zebrafish *Danio rerio* and the redeye tetra *Moenkhausia sanctaefilomenae*. Utilizing BrdU incorporation, significant interspecific variations relating to cartilage formation were determined. Specifically, interstitial proliferation was found to be more important for the shaping and subsequent growth of the cartilages in *D. rerio* than in *M. sanctaefilomenae*. Correspondingly, the expansion of the pharyngeal arches was more dramatic in *M. sanctaefilomenae* than in *D. rerio*. This study demonstrates that differential developmental mechanisms underlie the apparent disparities in craniofacial morphology between these two species of fishes.

Poster Presentation P14

**BIVARIATE BARYCENTRIC-COORDINATE BERSTEIN-BEZIER
POLYNOMIAL & C^1 QUADRATIC VERTEX SPLINE**

Rui Jiang and Tian-Xiao He*

Mathematics Department, Illinois Wesleyan University

By using simplex, a local coordinate system is defined, referred to barycentric coordinates. Based on barycentric coordinates, Bernstein-Bezier polynomial is defined, which brings a great convenience to present the smoothness of vertex spline. In this poster, we will show how to obtain Bernstein-Bezier polynomial of simplex in barycentric coordinates, and to present the proof of necessary and sufficient conditions of smoothness of vertex spline. By giving two examples, we will show two different subdivisions of simplexes into 6 and 12 triangles respectively so that Bezier nets of C^1 quadratic finite elements can be shown.

Poster Presentation P16

DESIGN AND ENGINEERING OF A MILLIMETER-WAVELENGTH SPECTROMETER

Constantine Karas, Kyle O'Shea and Thushara Perera*
Physics Department, Illinois Wesleyan University

This project encompasses the design and fabrication of a Fourier Transform Spectrometer (FTS) that will be used to study the millimeter-wavelength optical properties of cosmic analog dusts at astronomically relevant temperatures (close to absolute zero). Autodesk Inventor was used to digitally design parts of the FTS and Inventor's Computer Aided Machining (CAM) feature was used to generate an instruction set for our recently acquired Computer Numerical Control (CNC) milling machine. The CNC mill was used to precisely machine FTS parts to within 0.002".

The FTS consists of two flat aluminum mirrors that reflect millimeter wavelength light at a 45-degree angle, two sets of five side mirrors, a center aligner, a vacuum enclosure, and a centerpiece that holds four polarizers. With the exception of a few parts whose optical accuracy is critical, students in Illinois Wesleyan's physics department machined every component of the FTS.

A large element of this project involved learning how to use the new CNC milling machine starting from a shallow pool of expertise. In addition to the research and self-education that went toward properly operating the CNC mill, certain parameters such as feed rates and spindle speeds used for producing accurately machined parts were found empirically through trial and error.

On the engineering front we have designed a system for moving a translational stage within the FTS that moves by increments of 0.001". This presentation describes the current status of the construction of the FTS and immediate plans for completion and testing by summer 2016.

Poster Presentation P17

**A TRANSPOSON MUTAGENESIS SCREEN FOR HETEROCYST
PRODUCTION IN A $\Delta HETP$ STRAIN OF THE
CYANOBACTERIUM *ANABAENA***

Rachel Ende and Loralyn Cozy*
Biology Department, Illinois Wesleyan University

The ability for organisms to genetically control cellular differentiation is a fundamental question of development. The multicellular cyanobacterium *Anabaena* maintains the ability for vegetative cells to differentiate into specialized heterocysts capable of nitrogen fixation. The genetic network responsible for initiating and regulating this differentiation is not fully understood. To identify genes within this differentiation network, a heterocysts deficient mutant of *Anabaena* was subjected to transposon mutagenesis. A transposon, a piece of DNA capable of random insertion into the genome was introduced into this heterocysts deficient strain. Following the introduction of the transposon, the cells were grown on nitrogen-limited media containing antibiotic to select for cells in which the transposon had inserted into the genome and restored heterocyst function. These colonies were then analyzed with light microscopy to characterize the amount and pattern of heterocysts development and inverse PCR was performed to identify the specific location of transposon insertion within the genome. The genes identified through this screen will be the subject of future research.

Poster Presentation P18

FUNCTIONAL COMPLEMENTATION OF Z-RING REGULATION BY ALLELES OF *HETP* IN *ANABAENA*

Christina Khouri and Loralyn Cozy*
Biology Department, Illinois Wesleyan University

Anabaena is a filamentous cyanobacterium that is able to undergo cell-differentiation in nitrogen-limiting conditions to produce a nitrogen-fixing cell called a heterocyst. Under normal conditions, *Anabaena* will produce 10% heterocysts in its filament in about 23 hours. While the vegetative cells continue to divide by constriction of a protein ring, called the Z-ring, heterocysts do not contain z-rings and do not divide. In contrast, a Δ *hetP* mutant of *Anabaena* produces only 2-3% heterocysts at a later time of 48 hours, with z-rings present in about one-third of these heterocysts. The part of the *hetP* gene required for inhibition of z-ring formation in heterocysts is unknown. To identify this part of the gene, we attempted to complement Δ *hetP* mutant by the addition alleles of the *hetP* gene. Three alleles of *hetP* were tested in comparison to a Δ *hetP* mutant containing empty vector alone: a wild-type copy of *hetP*, *hetP* containing the amino acid mutations C36A and C95A, and a 68 base pair truncation of *hetP*. The presence of Z-rings in heterocysts was assessed after 48 hours in nitrogen-limiting conditions by fluorescence microscopy. Z-rings in heterocysts were only found in the Δ *hetP* strain of *Anabaena* containing an empty vector suggesting a limited region of the *hetP* gene that is required for z-ring loss in heterocysts.

References:

1. Higa, K. C., Callahan, S. M.. (2010) Ectopic expression of *hetP* can partially bypass the need for *hetR* in heterocyst differentiation by *Anabaena* sp. Strain PCC 7120. *Molecular Microbiology* 77(3): 564-574.

Poster Presentation P19

DIFFERENCES IN SPATIAL COGNITION IN CAPTIVE TIGER AND BEARS

Jessica Kraut and Ellen Furlong*

Psychology Department, Illinois Wesleyan University

Migrating long distances to find food, mates, and territories requires animals navigate long distances, yet exactly what cognitive mechanisms support such navigation remains unclear. Non-mammalian spatial cognition research suggests animals have an integrated map consisting of bearing (egocentric mechanisms: e.g., dead reckoning) and sketch (allocentric mechanisms: e.g., landmarks) maps. Do mammals that migrate, tigers and bears, also use these maps? Two Sumatran tigers, one grizzly bear, and one polar observed a rotating apparatus with two distinct landmarks, one baited with food. The animals chose which side had food using landmarks or rotation as cues. Binomial tests revealed animals found food more than expected by chance, and bears found food more than tigers. Thus, mammals can use a sketch map (landmarks or rotation) to find food. Further research should explore whether mammals rely on bearing maps and should further investigate species differences in sketch map use.

Poster Presentation P20

**USE OF A GLUTATHIONE S-TRANSFERASE (GST) TAG FOR
ISOLATION OF THE *BCH*E ENCODED PROTEIN OF
RHODOBACTER CAPSULATUS IN *RHODOBACTER CAPSULATUS***

Dorota Kulikowska and David Bollivar*
Biology Department, Illinois Wesleyan University

Bacteriochlorophyll plays an essential role in the process of photosynthesis in photosynthetic bacteria, but several of the enzymes involved in the synthesis of this tetrapyrrole are yet to be entirely understood. The step in which the ring structure of the tetrapyrrole is formed is catalyzed by the enzyme Mg-protoporphyrin IX monomethyl ester cyclase (MPE-cyclase) which converts the substrate MPE into protochlorophyllide (Pchl_{id}) and incorporates an oxygen atom from water. The gene *bchE* has been suggested to encode a protein required for MPE-cyclase activity in the photosynthetic bacterium *Rhodobacter capsulatus*. In order to study the cyclase enzyme, we attempted to isolate the polypeptide encoded by *bchE* by first expressing the protein using pRho expression vectors in *R. capsulatus*. With column chromatography we hoped to isolate the BchE protein for further studies and co-purify any strongly associated partners. Previous attempts to purify the BchE protein using a StrepII-tag were unsuccessful due to the presence of biotin utilizing enzymes in *R. capsulatus* which out-competed the StrepII-tag of BchE for binding to the streptactin column. In order to fix this problem, a GST-tag was fused with BchE protein as well and a glutathione chromatography column was used for purification.

Poster Presentation P22

**CHANGES IN EEG BRAIN ACTIVITY DURING PHYSICAL AND
SOCIAL PAIN ASSESSMENT IN CHRONIC PAIN PATIENTS
UNDERGOING SPINAL CORD STIMULATION (SCS) THERAPY**

Nitesh Kumar, Randi Wilson and Joseph Williams* and David Ceden*
Psychology Department, Illinois Wesleyan University

Spinal Cord Stimulation (SCS) therapy is an effective method of using electricity to treat chronic pain when other therapies, including invasive surgical interventions, have failed. In SCS, stimulating electrode arrays (called leads) are implanted epidurally inside the spinal canal above the dorsal aspect of the spinal cord through a minimally invasive, reversible surgical procedure. The application of safe levels of electrical current to the dorsal portion of the spinal cord is known to provide an analgesic effect, reducing pain in patients by 68% compared to their initial pain levels. SCS improves patients' functional and psychological status, enables patients to return to work, and reduces patients' reliance on opioid pain medication. While SCS has a clear therapeutic effect, the exact neural mechanism behind the analgesic effects of SCS remains poorly understood. Other studies have shown consistent changes in frontal and parietal cortex brain activity during both physical and social pain. The present study recorded electroencephalogram (EEG) brain activity to examine the neural mechanisms associated with both social and chronic physical pain in subjects currently undergoing SCS therapy. EEG is a common technique used in psychological and medical research to record the firing of brain cells (through an electrode cap placed over the scalp) during various behavioral states. This is the first study to examine changes in EEG brain patterns in SCS patients for both physical and social pain. Understanding the neural mechanism behind SCS therapy can lead to refinements in SCS procedures and potentially increase the efficacy of the treatment and, in turn, the quality of life of patients who suffer from chronic pain conditions.

Poster Presentation P23

INCOME MOBILITY THROUGH EDUCATION IN THE UNITED STATES

Maxwell Leonard and Robert Leekley*
Economics Department, Illinois Wesleyan University

This study makes use of the National Longitudinal Survey of Youth (NLSY) in order to examine the relationship between experiencing poverty as a youth and income as an adult. Human capital theory, as well as previous empirical research suggests that as standard of living as a youth increases, future income as an adult should increase as well. This paper attempts to study this effect through both direct and indirect pathways. The indirect pathway that we are interested in is education. We measure this indirect pathway by multiplying the effect on income of having a certain degree by the effect of being in poverty on the likelihood one obtains that degree. Our results show that those who grew up in poverty are less likely to achieve a higher degree. This in turn affects these impoverished youths' ability to obtain higher wages as adults, perpetuating a cycle of poverty.

Poster Presentation P24

QUANTUM OPTICS AND SINGLE PHOTON QUANTUM INFORMATION PROCESSING

Zhenghao Ding, Lunjun Liu, and Gabriel Spalding
Physics Department, Illinois Wesleyan University

The possibility of using elementary particles, such as photons and electrons, to do information processing has been recognized for a long time, using quantum parallelism and quantum entanglement for information storage, computation and quantum key distribution. Recent advances, such as single-ion logic gates, nitrogen-vacancy diamond-based quantum logic gates and even the birth of the first silicon quantum processor, each offer distinct advantages and challenges. We begin our study of quantum information processing by studying quantum optics. We have performed experiments such as spontaneous parametric down conversion, for production of entangled photon pairs, as well as initial explorations of single-photon interference.

Poster Presentation P25

**DETERMINING THE VIABILITY OF PRESERVED CELL
SUSPENSIONS FROZEN OVER TIME WITH VARIED
GLYCEROL CONCENTRATIONS**

Elyse McCormick and Brian Walter*
Biology Department, Illinois Wesleyan University

Cell Viability measures how long cells will stay alive after being cultured, that is, how long they are viable in a given experimental condition. In this project, cells were subjected to a -70°C freezer and different concentrations of glycerol as a cryoprotectant. Two organisms were tested in this experiment: *Schizochytrium* spp. and *E. coli*. Vial lots of each organism were made and placed in a -70°C freezer. After allotted times, vials with concentrations of 10% glycerol, 15% glycerol, and 20% glycerol added to the broth were tested by aerobic plate counts to see the viability of the cells. The *Schizochytrium* spp. vials were tested by a Cellometer® cell counter as well. The preliminary results seem to show that this experiment is a good and useful model for studying viability in these strains. Ultimately, this experiment will be run for two years in order to determine viability over time.

Poster Presentation P26

THE INFLUENCE OF SOCIAL EXCLUSION ON SELF-REGULATORY CONTROL: NEURONAL AND BEHAVIORAL ACTIVITY EFFECTS DURING SUBSEQUENT COGNITIVE TASKS

Anna Moczynski and Jason Themanson*
Psychology Department, Illinois Wesleyan University

Research indicates that social exclusion has negative effects across behavioral and emotional domains. Recent studies extend these findings to the cognitive domain, such that neural activity and accuracy were diminished following exclusionary events. Their findings suggest that processes used for self-regulation during social events and cognitive tasks share a neural framework. The current study implements a time-estimation task as a cognitive performance outcome measure, providing insights as to how ongoing feedback affects one's ability to implement self-regulation during cognitive tasks. Recognizing that the Anterior Cingulate Cortex (ACC) is involved in self-regulation, this study examines two indices of ACC activation- the Feedback related negativity (FRN) and the N2- following a social event created by the Cyberball paradigm. Results found that social exclusion affected behavioral activity such that task accuracy and reaction times did not improve on the second cognitive task for excluded participants, whereas included participants improved. Excluded participants also exhibited neural sensitivity to positive feedback on the subsequent cognitive task. We also found a negative relationship between neural behavior during the social task and neural behavior on the subsequent cognitive task. These findings have implications in the broader domain of self-regulation, as they provide evidence of social exclusion's disruptive effect on self-regulatory resources.

Poster Presentation P27

A NEW TECHNIQUE FOR IMAGING REAL-TIME CYTOKINE SECRETION

Sydney Muchnik and Brian Walter^{1*} and Ramesh Ramji^{2*} and Kathryn Miller-Jensen^{2*}

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The analysis of single cell cytokine secretion has become an area of great interest in research relating to the immune system and disease. Cytokines, the small proteins that cells secrete for signaling, are used to categorize immune cell's responses to disease, drugs, or other stimulation. The most advanced widespread assay for single cell cytokine secretion is the fluorospot assay, a technique that utilizes multiple fluorescent markers to visualize the secretion of two or more cytokines simultaneously. However, this assay only provides data about the percentage of total cells that are secreting cytokines at a fixed time point, because cells must be removed from the plate before imaging. Therefore, our goal is to develop an assay that retains cells individually, allowing for continuous analysis of single cell secretion over a time course. In this work, we use T cells latently infected with a GFP-tagged HIV virus, which allows us to visualize the activation of the virus and cell secretion in response to this activation. In the assay we developed, a microfluidic device containing pillar traps is used to suspend the cells individually. A channel in the device contains the traps, which are coated in a capture antibody. Flowing through a stimulant activates the latent HIV in the cells. Cytokine secretions are visualized using fluorescently tagged antibodies. We have successfully detected IL-2 secretion by individual J Lat 10.6 cells in a fixed-time version of this assay, and are working to perform this technique over a 6 to 18 hour time course. We will utilize this technique to explore the timing of the activation of latent HIV in relation to cytokine secretion, and will use image processing to quantify the secretion of each cell. The technique we are developing will also be applicable in other contexts, as it will ultimately enable identification and quantification of single cell cytokine secretion over a long period of time.

Poster Presentation P28

A SURVEY OF BIRD-WINDOW COLLISIONS ON THE ILLINOIS WESLEYAN UNIVERSITY CAMPUS

Alexander Mueller, Roberta Steinert and Given Harper*
Environmental Studies Program, Illinois Wesleyan University

Collisions with building windows are a major anthropogenic source of bird mortality, with estimates of 100 million to 1 billion birds killed annually in the United States (Loss et al. 2014). However, this phenomenon has not been investigated on the IWU campus, which was the purpose of our study. We conducted daily bird carcass searches from 11 September to 30 October 2015 at The Ames Library, State Farm Hall, a portion of Presser Hall, and The Minor Meyers Welcome Center. We collected 25 individuals of 12 species; Swainson's Thrushes (*Catharus ustulatus*; N = 7), Gray-cheeked Thrushes (*Catharus minimus*; N = 3), and Magnolia Warblers (*Setophaga magnolia*; N = 3) were the most frequently collected species. There were more bird-window collisions at larger buildings but we found no significant difference in the number of collisions from buildings built to LEED specifications (i.e., with larger window areas) compared to non-LEED buildings. Additional studies should be conducted in both the spring and fall migration seasons to gain a better understanding of bird-window collisions on the IWU campus, and to determine ways to reduce them.

Poster Presentation P29

STRESS & WELL-BEING: THE ROLE OF SOCIAL SUPPORT EXCHANGED WITH ADULT CHILDREN

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Psychology Department, Illinois Wesleyan University

The current study explores how aspects of social support exchanged between older parents and their adult children might arbitrate the effects of stress on different dimensions of well-being. While unchecked stress can be deleterious to well-being, social support is generally advantageous to well-being. As such, scores of studies have described social supports' role as a mediator in the relationship between stress and well-being. Although previous findings suggest family support increases in importance as people age, and the quality of relationships with adult children in particular have notable psychological and social consequences for older parents, social support between older parents and adult children has not been explored as a mediator in the relationship between stress and well-being. Using newly developed measures of social support exchanged between parents and their adult children, data from *Successful Aging in Context* were used to test whether (1) perceived quality of the parent-child bond mediates the relationship between perceived stress and life satisfaction, and (2) perceived quality of the parent-child bond mediates the relationship between perceived stress and social integration. There is limited evidence to suggest that relationship quality between older parents and adult children mediates the relationship between stress and life satisfaction.

Poster Presentation P30

CAN THE WORKING INDUSTRY TELL ABOUT YOUR CHANCE OF GETTING HEALTH INSURANCE? A STUDY ON THE HEALTH INSURANCE COVERAGE OF WORKING ADULTS IN THE U.S.

NgocGiao Nguyen and Robert Leekley*
Economics Department, Illinois Wesleyan University

Employer-provided insurance plans are by far the most utilized form of coverage in the private sector because of their lower costs and less adverse selection consequences. A survey conducted in 2013 by American Community Survey estimated that about 74% of the insured population were covered by their employers. However, the insured rates reported vary widely across eight working industries according to the report issued by the Kaiser 2014 Annual Survey, with the lowest rate of 37% and the highest rate of 92%. What can be the possible explanations for this erratic variation?

My research hypothesizes that individuals who work in industries with more large-sized firms will have higher chance of getting covered by employers than individuals who work in industries with more small-sized and medium-sized firms, with regard to the same level of income. This research employs logistic regression to examine the probability of an individual to get health insurance coverage through their employers on the basis of income level across different working industries. The data set used is published by the 2014 Medical Expenditure Panel Survey (MEPS), which can be extracted from the MEPS online database.

The results can potentially be used by policy makers to evaluate regulations with respect to different industries to expand employment-based health insurance coverage and ensure adequate healthcare for more U.S. citizen.

Poster Presentation P31

c7 AND C7 COMPLEMENT MULTIDECOMPOSITION OF K_n

Hang Phung and Daniel Roberts*

Mathematics Department, Illinois Wesleyan University

If all edges of K_n can be partitioned into copies of a graph G , such design is called a G -decomposition of K_n , or G -design of order n . The extension of this design, called multi-decomposition, is decomposition of K_n by a graph pair. For any integer $v \geq 4$, a graph-pair of order v is a pair of non-isomorphic graphs G and H of order v such that there are no isolated vertices and $E(G) \cup E(H) = E(K_v)$. A $(G; H)$ –multi-decomposition of K_n is determined when all edges of K_n can be partitioned into copies of G and H with at least a copy of either G or H . In the past, the multi-designs for all graph-pairs of order 4 and 5 have been finished and published in 2003. The necessary and sufficient conditions for the existence of a $(C_6; \overline{C_6})$ – multi-decomposition of K_n has also been found out by Gao Yizhe. This paper is dedicated to continuing the project by determining the condition for n such that there exists $(C_7, \overline{C_7})$ –multi-decomposition of K_n .

Reference

Abueida, A. A., and Daven, M. Multidesigns for graph-pairs of order 4 and 5. *Graphs and Combinatorics*, 19(4), (2003) 433-447.

Poster Presentation P32

SECOND GENERATION IMMIGRANTS: THE EFFECT OF PARENTAL NATIVITY STATUS ON EARNINGS

Karen Silverman and Michael Seeborg*
Economics Department, Illinois Wesleyan University

There has been a significant amount of debate in recent years about the economic performance of immigrants. Understanding the economic contribution of the second generation is important in order to provide a more comprehensive picture of the total impact of immigrants in the United States. There is strong evidence to suggest that second generation immigrants have experienced upward income mobility, and human capital theory hypothesizes that the economic performance of the second generation will match that of natives. It also predicts that having one immigrant parent and one native parent as opposed to having two immigrant parents will lead to a difference in earnings. The purpose of this research is to determine if second generation immigrants have reached income parity with natives as a whole and on a country specific basis, and how the parental nativity status of the second generation affects those earnings. Data from the 2010-2015 IPUMS Current Population Survey allows the nativity and birthplace status of the respondents' parents to be related to their income. An analysis of those data indicates that second generation immigrants as a whole have reached income parity with natives. Furthermore, second generation immigrants with an immigrant mother and native father experience a slight edge in their earnings over natives and their cohorts. This pattern follows when analyzing the second generation of Mexican immigrants, but not Asian immigrants.

Poster Presentation P33

RESTORATION OF HETEROCYST PRODUCTION TO A Δ HETP STRAIN OF *ANABAENA*

Megan Smeets and Loralyn Cozy*
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Anabaena sp. Strain PCC 7120 is a filamentous cyanobacterium capable of differentiating a nitrogen-fixating cell type called a heterocyst. The *hetP* gene has been identified as being required for the normal magnitude and timing of heterocyst formation. Where as a wild type strain produces 10% heterocysts in 23 hours, a Δ *hetP* strains produces only 2-3% heterocysts in 48 hours. How the loss of *hetP* leads to this phenotype is currently unknown. To identify genes downstream of *hetP* in the differentiation pathway that could be aiding in its function during heterocyst formation we performed a forward genetic screen. A Tn5 transposon was introduced via conjugation into a Δ *hetP* strain and plated on nitrogen deficient media with selection. Surviving colonies were assayed for restoration of wild-type heterocyst accumulation and timing of development. The DNA of these strains was isolated and the transposon location was identified. We demonstrated a class of genes whose inactivation is capable of restoring wild-type heterocyst formation in the absence of *hetP*. Future work will examine the function of these genes in relation to *hetP*.

Poster Presentation P34

**PHAGE FOR THOUGHT: INVESTIGATING THE INGESTION AND
ASSIMILATION OF VIRUSES INTO ROTIFER
(*BRACHIONUS PLICATILIS*) TISSUES**

Brittany Straznickas and William Jaeckle*
Biology Department, Illinois Wesleyan University

Rotifers are a group of suspension-feeding aquatic invertebrate animals that range from approximately 50–2,000 micrometers in size. The typical food sources for rotifers (i.e., unicellular algae, 2-10 micrometers in diameter) are visible with light microscopy. Bacteriophages (viruses that use bacteria as hosts) are too small (30-110 nanometers in diameter) to be seen using light microscopy, but are present in great abundance ($\sim 10^{30}$ in the world's oceans). If or how particles as small as bacteriophages are consumed as food is incompletely known; Sorenson ('15) reported that rotifers ingest water containing the fluorescently-labeled (Dichlorotriazinylamino fluorescein, DTAF) bacteriophages. We exposed the rotifer *Brachionus plicatilis* to DTAF-labeled bacteriophages [10^8 bacteriophages /mL] for 3-5 hours and monitored the presence and distribution of the label in rotifer tissue using fluorescence and scanning laser confocal microscopy. As expected, the greatest amount of DTAF-fluorescence was detected in the lumen of the stomach, and with increasing distance from the stomach the intensity of the fluorescence decreased. In general, between the stomach lumen and the epithelium of the stomach there was a 50% difference in fluorescence and the lowest fluorescence was detected in the outer body wall. Using confocal microscopy, the fluorescence within the cells of the stomach was detected in circular vesicles suggesting that DTAF-labeled phages were absorbed by endocytosis, while free DTAF was not so localized. These findings suggest that rotifers are ingesting and assimilating nutrients from bacteriophages.

Poster Presentation P35

FUNCTIONAL ANALYSIS OF A PUTATIVE HOMING ENDONUCLEASE

Nikhilesh Thapa and David Bollivar*
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Endonucleases are enzymes that cleave phosphodiester bonds within polynucleotide chains such as DNA and RNA. A subgroup, homing endonucleases (HEase) are also able to propagate their encoding genes by transforming host genes to incorporate the homing endonuclease gene (HEG). This process is initiated by the expression of the HEase from the HEG, which then cleaves a homolog. The homolog subsequently undergoes a homologous recombination event as a repair mechanism, and in the process integrates a copy of the HEG. Based on predicted sequence, gene product (gp126) from the mycobacteriophage Gizmo is thought to encode for a HEase. Previous work constructed a vector for gp126 from which protein was expressed and purified. The goal of this study was to demonstrate that the DNA of the mycobacteriophage Shrimp was a viable target for the HEase and to characterize the function of the homing endonuclease. Shrimp has a very similar sequence to Gizmo, which contains the putative homing endonuclease, making it a viable substrate for experimentation. Demonstration of DNA binding will be a first step in the characterization of the interactions between gp126 and the Shrimp DNA.

Poster Presentation P36

ANXIOUS ATTACHMENT AS A PREDICTOR OF RISKY SEXUAL BEHAVIOR

Larissa Valentino and Marie Nebel-Schwalm*
Psychology Department, Illinois Wesleyan University

Risky sexual behavior (e.g., early sexual debut, multiple partners, unprotected sex, one night stands, and substance use; Kahn et al., 2015; Merianos et al., 2013) tends to emerge and peak in adolescence and persist into young adulthood. This behavior can lead to many negative consequences such as sexually transmitted infections (STIs) and unplanned pregnancy. Attachment theory states that human infants have evolved to maintain proximity to their caregivers (attachment figures). In turn, the quality of repeated interactions with attachment figures in times of distress shapes future patterns of cognitions and interactions. Researchers have suggested that adult relationships may reflect similar attachment orientations to those observed in children (Bogaert & Sadava, 2002). Since the attachment system is the earliest developing social-behavior system, it may influence the later developing sexual system (Birnbaum, 2007). Thus, relationships involving sexual intimacy may be used to meet attachment needs (Snapp et al., 2007). The current study investigates the relationship between anxious attachment and risky sexual behavior, as well as anxious attachment and motivations for engaging in risky sexual behavior. We predict that individuals who report more anxious attachment will be more likely to engage in risky sexual behavior. We also predict that individuals who report more anxious attachment will engage in risky sexual behavior for reasons related to seeking security and reassurance.

Poster Presentation P37

NEURAL AND BEHAVIORAL EFFECTS OF SOCIAL EXCLUSION ON SELF-REGULATION

Natalie Weimer and Jason Themanson*

Psychology Department, Illinois Wesleyan University

Research investigating the effects of social exclusion on neural activity propose there is a common neural framework underlying self-regulatory processes for both social and cognitive behaviors. This study will shed light on the engagement of these processes across social and cognitive task domains by investigating the effects of social exclusion on cognitive task execution. Neural activity was measured while participants completed two flanker task sessions with the Cyberball paradigm occurring in between; additionally, half of the participants were excluded during the Cyberball paradigm. Results showed that, similar to previous research, social exclusion led to impairments in subsequent flanker task performance. Further, there was a relationship between neural activity and task behavior. For excluded participants, neural activity during the first flanker task session was associated with neural activity during Cyberball. These findings diverge from previous studies by suggesting that social exclusion via Cyberball doesn't just impair post-error performance in subsequent tasks; rather exclusion impacted overall task performance in the current study.

Poster Presentation P38

EXPLORING DIFFERENTIAL OPPORTUNITY AMONG INNER CITY BLACK MEN

Inez White and Meghan Burke*

Sociology Department, Illinois Wesleyan University

Segregation has played an important role in unequal access to quality education, which leads to limited opportunities in the job market. This study considers the role of human capital, delinquency, familial influence, and other key factors that may lead to the disadvantages faced by young African American men that live in metropolitan Chicago. Drawing upon interview data, this analysis explores connections between inequalities within the workforce and the negative misconceptions of this group in society at large. Overall, the men in this study displayed a positive correlation between low human capital and deviance and a negative correlation between parent involvement/ encouragement with school and non-deviant behavior. All participants also either implied or admitted to utilizing the informal labor market as an alternative means to securing income, and although some did perceive inequality with regards to education, the majority did not. Notably, most are employed within legitimate workforce. I conclude by exploring existing models of fair community-based education that have been proven to counter these disparities.

Poster Presentation P39

GENERALIZED CATALAN NUMBERS AND THEIR PROPERTIES

Yuanziyi Zhang and Tian-Xiao He*

Mathematics Department, Illinois Wesleyan University

Considering the recurrence relations and generating functions of Catalan numbers and Schröder numbers, we define a class of generalized Catalan numbers and its generating function with the above two number sequences and many others as its special cases. The combinatorial properties of generalized Catalan numbers, including the continued fraction of the generating function, the Hankel decomposition, the Hankel transform and the total positivity of the Hankel matrix, are presented.

Poster Presentation P40

INTEGER ANTIMAGIC LABELING FOR CYCLE WITH ONE CHORD

Jinze Zheng and Daniel Roberts*

Mathematics Department, Illinois Wesleyan University

For $k \geq 2$, a graph G is called Z_k -*antimagic* if there exists a labeling of its edges $f: E(G) \rightarrow Z_k - \{0\}$ such that the labels induced on the vertices given by the sums of the labels of the edges incident to each vertex are all distinct. For a given graph G , the *integer antimagic spectrum* is the set of all integers k for which G is Z_k -antimagic. This project focuses on characterizing the integer antimagic spectrum for a class of graphs $C_n(l)$, which are composed of a cycle and a chord inside the cycle, C_n . Our method consists of the alternating path and alternating cycle labelings and also previous results on the existence of Z_k -antimagic labelings of cycles.

EDUCATIONAL STUDIES

POSTER PRESENTATIONS - SESSION 1

**April 16, 2016, 9:00 – 10:00 am
SFH FOYER/SFH 101**

- 1.1 Alexandra Burnside
- 1.2 Alyssa Davis
- 1.3 Lauren Pavich
- 1.4 Gina Mayer
- 1.5 Rebekah Smith
- 1.6 Angela Herrmann

ORAL PRESENTATIONS - SESSION 2

**April 16, 2016, 10:00 – 11:00 am
SFH 102**

MODERATOR: JOCELYN VANDERWIEL

- 2.1 V. Miranda Wilson
- 2.2 Elena Duve
- 2.3 Stephanie Stahl
- 2.4 Briana Carter

POSTER PRESENTATIONS - SESSION 3

**April 16, 2016, 11:00 – 12:00 noon
SFH FOYER/SFH 101**

- 3.1 Devon Busbia
- 3.2 Ashley Spain
- 3.3 Lauren McAnally
- 3.4 Emma Moris
- 3.5 Kellie Pilalis
- 3.6 Frank Toland
- 3.7 Anna Oliveri

Poster Presentation ES P1.1

IMPLEMENTING DIFFERENTIATED MATHEMATICS INSTRUCTION: A SELF-STUDY

Alexandra Burnside and Leah Nillas*
Educational Studies, Illinois Wesleyan University

Designed to meet the diverse needs of heterogeneous classrooms and aid students in meeting their full academic potential, differentiated instruction (DI) is commonly viewed as an effective method of tailoring instruction to students' needs. A review of relevant literature exposes a shortage of empirical research on this educational trend, leading to debate regarding the implementation and effectiveness of differentiated mathematics instruction. In an attempt to address this void, this research includes a systematic review of the literature, qualitative analysis of data (i.e., lesson plans, field notes, student work) gleaned from a teacher's self-study, and a discussion of the results and implications. This self-study was conducted with the purpose of implementing various differentiated strategies and observing their effectiveness within a third grade classroom. Research focuses on the content and process of differentiated mathematics instruction (as laid out in Tomlinson's framework) based on student interest, readiness, and learning style, emphasizing conceptual understanding and mathematical reasoning (Tomlinson et al., 2003). Preliminary findings indicate DI strategies (i.e., parallel tasks, incorporating choice) foster an environment in which students persevere and take ownership of their learning. Ultimately, this study provides insight into the implementation of differentiated mathematics instruction and shows teachers how DI may impact their students' mathematical understanding.

Poster Presentation ES P1.2

DEVELOPING LIFE SKILLS IN YOUNG STUDENTS

Alyssa Davis and Leah Nillas*

Educational Studies, Illinois Wesleyan University

School environment, children engaging with learning, developing their life skills, their self-expression and communication skills are all important and relate to the child's interaction with adults (teachers or parents) and with their peers (FitzPatrick, 2014). In today's society, the students within schools are typically quite diverse. Because children tend to develop judgments later in childhood, teaching tolerance and social justice at a young age may contribute to self-acceptance and group acceptance of diversity. Upon researching methods and the effectiveness of teaching life skills to young students, I found that incorporating lessons on life skills in the classroom decreases the chances of students developing problem behavior during childhood and adolescence (Prince, 2010). I conducted a study on first graders, in which I implemented lessons on life skills and assessed the effectiveness of the various strategies used while teaching. The results indicate that role-play is an effective form of teaching life skills and that young students are quite capable of problem-solving an issue relevant to their own lives.

Poster Presentation ES P1.3

HOW FAMILIES' LIFESTYLES ARE IMPACTED WHEN THERE IS A CHILD OR PARENT WITH A COGNITIVE DISABILITY

Lauren Pavich and Leah Nillas*

Educational Studies, Illinois Wesleyan University

Today, millions of people have been diagnosed with a disability. Ultimately, this leaves an impact, whether it be a positive one or not, on the families and/or caregivers in people's lives (Trivette, 2010 & Vohra, 2013). In this review of the literature, there are several analyzed studies that focus on the level of involvement and what kind of impact involvement may have on the loved one with a disability. Looking more thoroughly into these studies, there becomes a trend of what roles the family member with the disability play and to what extent their disability may impact the home. Through these studies it can be proven that the higher the level of involvement, the higher level of impact and the lower level of involvement can lead negative and consequential lifestyles. This study is on the topic of how having a child or parent with a cognitive disability impacts a family's lifestyle and involvement based on influence in this family member's life.

Poster Presentation ES P1.4

INQUIRY BASED LEARNING: EFFECTS ON STUDENT LEARNING

Gina Mayer and Leah Nillas*

Educational Studies, Illinois Wesleyan University

As educational theories continue to grow, change, and resurface, inquiry based learning (IBL) is a student centered approach that is known to have benefits and consequences. As Walker (2006) describes it, IBL provides students empowerment. This strategy focuses on students beginning to ask questions, work as teams, and problem solve on their own, as opposed to memorizing the information. During student teaching, a researcher attempted to seek out the effects of IBL on students' learning. After implementing various types of lessons and activities, it is discovered that the students are not used to this style of learning in mathematics and are hesitant at first. Some students are still reluctant to this teaching style, and prefer lectures and a more teacher-centered teaching pedagogy, but a majority of students prefer to learn in a more student-centered classroom in which they are given the opportunity to work together to understand the mathematics at a conceptual level.

Poster Presentation ES P1.5

BEYOND THE LITERARY CANON: INCORPORATING YOUNG ADULT LITERATURE INTO THE CLASSROOM

Rebekah Smith and Leah Nillas*

Educational Studies, Illinois Wesleyan University

Engaging students in literature is an extremely important aspect of instilling a lifelong love of reading, but this is difficult in a world where Facebook is more enticing than an old, battered copy of a book for school. Classic books from the Literary Canon are becoming outdated and less beneficial in the classroom. By incorporating more contemporary Young Adult Literature into the classroom, students can gain the skills necessary for success with standardized testing while increasing their interest in reading. This self-study was conducted to evaluate students' perspectives on the literature and self-selected adolescent titles. Collected data included whole class student surveys, practice tests, focus group notes, and a post-semester anonymous online survey. The findings support that the incorporation of Young Adult Literature increases students' interest in reading and improves students' ability to relate to the characters as well as their performance on standardized tests.

Poster Presentation ES P1.6

**INDIVIDUALIZING BEHAVIOR MANAGEMENT:
IMPACT ON STUDENT ACHIEVEMENT**

Angela Herrmann and Leah Nillas*
Educational Studies, Illinois Wesleyan University

Teachers frequently identify classroom behavior management as an area in which they struggle. According to Shook (2012), twenty percent of new teachers leave the teaching profession within one year because of the difficulties and challenges they face concerning behavior management. A key component to managing a classroom is getting to know your students and their specific needs. In this self-study, I discuss how individualized behavior management approaches affect student achievement. Specifically, I focus on students with Emotional Behavior Disorder (EBD) and explore common behavior management strategies that can be applied in the classroom and their impact on student achievement. I collected and analyzed data from field notes and anecdotal notes, which included documentations of my classroom observations, staff collaboration discussions, and personal teaching experiences. Related to current research, I highlight the importance of individualizing behavior management approaches based on students' needs. If students' needs are met, then students are more likely to be academically successful and their achievement will improve.

Oral Presentation ES O2.1

THE IMPACT OF A CULTURALLY RELEVANT CURRICULUM IN A BILINGUAL CLASSROOM

V. Miranda Wilson and Leah Nillas*
Educational Studies, Illinois Wesleyan University

Brown-Jeffy and Cooper (2011) suggest that culturally relevant teaching allows teachers to acknowledge students' home cultures by integrating relatable cultural experiences, values, and understandings into the learning environment. According to Lee (2010), if these strategies are not implemented, students can be limited by the instruction they receive because it disregards their native language and culture. The empowerment of both is necessary in order to create a successful learning environment. This self- study explores the effects of culturally relevant teaching in a first grade bilingual classroom. In this qualitative study, I utilized field notes, lesson plans, and student work samples to examine the integration of students' cultures into the curriculum and the impact this has on the twenty- one students. As a result of this integration, I found an improvement in academic achievement, respect amongst students, and an increased level of engagement in the ELA, science, and social studies content areas.

Oral Presentation ES O2.2

ENRICHING THE LANGUAGE LEARNING EXPERIENCE THROUGH TECHNOLOGY

Elena Duve and Leah Nillas*

Educational Studies, Illinois Wesleyan University

This literature review explored the different ways in which technology affects the language skills of second language learners. Multiple case studies, literature reviews, and journal articles were examined to create a conceptual framework illustrating how technology integration affects second language learning. The specific language skills reviewed focused on exposure to culture and authentic language, pronunciation and listening skills, writing and grammar, and vocabulary learning and retention. There are many types of technology used for the many different skills of learning a second language. The results from this review of the literature show that technology, for many reasons, is becoming a big part in the classroom. Although there are some types of technology (e.g., *VocabTutor* for mobile phone, video listening tests, and blogging (within the classroom)) that do not have an impact on students' learning, there are many (e.g., multimedia vocabulary learning, blogging (via intercultural exchange), and podcasting) that have a positive impact on the skills it takes to learn a second language.

Oral Presentation ES O2.3

USE OF MULTIMEDIA IN THE CLASSROOM AND ITS EFFECTS ON STUDENT LEARNING

Stephanie Stahl and Leah Nillas*

Educational Studies, Illinois Wesleyan University

The use of multimedia in the classroom has become a popular instructional method in recent years because of the assumption that the use of multiple modes addresses the differing learning styles present of students. Prior studies on the effectiveness of multimedia's abilities to improve student learning have conflicting results (Krippel, McKee, & Moody, 2010). In this self-study research, I incorporate different mediums (i.e., text, image, video, and simulation) into daily lessons throughout the year to examine how these tools affect students' learning and their ability to gain and improve skills necessary to understand concepts in social sciences. I collected data from student work, field notes, and lesson plans. Analysis of these data sources indicates that each results were inconsistent between mediums but there is evidence of improvement in student social science skills (e.g., critical thinking and decision making) and students' recall and transfer capabilities.

Oral Presentation ES O2.4

EXAMINING HOME-BASED CHILD CARE

Briana Carter and Leah Nillas*

Educational Studies, Illinois Wesleyan University

“Early childhood education programs have flourished over the past few decades as more and more parents come to believe in the benefits of starting children’s education as early as possible and find themselves in need of daycare” (Phillips, 2015, p. 1). In this literature review on child care, I analyzed and synthesized several Child Care studies and research articles. I focused on the significance of different types of child care service, parents expectations of the child care, benefits of early childhood education, and disadvantages in early childhood education. The role of home-based daycares and daycare centers each has a distinction that impacts the child differently through the information presented to them. Using several Child Care studies and research articles, home-based can provide a greater influence on the child’s future outcomes.

Poster Presentation ES P3.1

UNDERSTANDING THE IMPLICATIONS AND ADDRESSING DEFIANCE IN THE CLASSROOM

Devon Busbia and Leah Nillas*

Educational Studies, Illinois Wesleyan University

Defiant behaviors in the classroom can be frustrating, confusing, challenging, and stressful for an educator. Defiance can be addressed through many research-based strategies; however, there is very little preparation given in preservice teacher education programs on these topics (O'Neil & Stephenson, 2013; Smart & Igo, 2010). The consequences of this lack of education have been linked to emotional and physical stress in educators. In turn, linking to teacher burnout rates. I collected data from field and anecdotal notes, school policies, and the use of the PBIS Check-in-Check-out system to acknowledge students' behavior. By considering relevant research as well as personal data that I have examined the effects of defiance in the classroom on educators and students as well as discovered clear and effective approaches and strategies toward management.

Poster Presentation ES P3.2

SOCIOECONOMIC STATUS AND STUDENT ACADEMIC PERFORMANCE

Ashley Spain and Leah Nillas*

Educational Studies, Illinois Wesleyan University

The injustices imposed on children based on their home, community, and social environment ultimately becomes injustices they encounter throughout their lives as well, post their school years (Coleman, et al, 1966). Social scientists have studied socioeconomic status (SES) in its relation to academic achievement and have been doing so for decades. The purpose of this research synthesis is to examine the relationship between socioeconomic status and student achievement and the implications of student's SES on academic performance. After conducting a multi-step research approach, grounded theory was employed to construct a conceptual framework identifying common themes describing the relationship. It has been concluded that there are internal (SES of individual student households) and external (SES and school resources allocations) factors that impact student's learning achievement.

Poster Presentation ES P3.3

FOSTERING ENGAGEMENT IN A MIDDLE SCHOOL CLASSROOM

Lauren McAnally and Leah Nillas*

Educational Studies, Illinois Wesleyan University

The purpose of this qualitative study is to investigate how to properly implement and create a classroom that fosters engagement. This study looks at the practices, strategies, roles, and relationships that are necessary in order to fully engage all students in the classroom. During the course of this research, engagement is found to be a very broad term. In this study, *engagement* is defined as students synthesizing information in student-directed learning environments where they are physically and mentally involved (Edwards, 2015; Trowler, 2010). The hope of this study is to emphasize the need for educators to understand the meaning of engagement and the importance of engaging students in daily lessons in the classroom. Studies show increasing awareness about engagement can create a connection between students and curriculum (Trowler 2010). By creating a framework for a classroom to foster engagement, students are then able to reach their full learning potential.

Poster Presentation ES P3.4

CREATIVE TEACHING STRATEGIES AND STUDENT LEARNING

Emma Moris and Leah Nillas*

Educational Studies, Illinois Wesleyan University

This research is conducted in the style of a synthesis, in which selected articles are analyzed to examine various methods of creative teaching and their implications on student learning. Often, teachers rely on textbooks and worksheets to deliver lessons; however, this technique neglects to meet the diverse learning needs of each student in the classroom. Creative teaching strategies, such as dance, creative movement, drama, and creative writing, are considered some of the innovative ways for students to be presented with content material. Research reveals that not only do students respond well to these teaching strategies, they are also more inclined to express their own forms of creativity within the environment of the classroom.

Poster Presentation ES P3.5

USING STRATEGIES TO PROMOTE STUDENTS' CRITICAL THINKING ABILITIES

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Teachers are helping prepare students for the future by implementing critical thinking strategies daily in the classroom. Taylor and Peterson (2012), Duesbery (2015), and D'Angelo (1978) showed evidence that students' reading scores consistently grew, their thoughts, questions, and ability to make connections, and their understanding for how to form critical thinking questions increased. In this qualitative self-study, I discuss different strategies to promote and increase critical thinking abilities in the classroom. Specifically, I focus on achievement and improvements in English Language Arts (ELA). I collected and analyzed data from field notes, pre- and post- self-assessments, and classroom observations. Relating to current research, I highlight the importance of modeling critical thinking strategies in everyday classroom settings so students can begin to understand the questions, how to respond to these questions, and create their own critical thinking questions. Through this process, students are more likely to achieve higher academic success in ELA, as seen through improvements on their reading comprehension, fluency, and ability to create questions.

Poster Presentation ES P3.6

MAKING ACADEMIC LANGUAGE ACCESSIBLE FOR ENGLISH LANGUAGE LEARNERS

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One of the most troubling aspects of school for English Language Learners (ELLs) is academic language. Dicerbo, Anstrom, Baker and Rivera (2014) define *academic language* as "the language used in school to help students acquire and use knowledge" (452). As the academic rigor increases and content knowledge becomes more important than language development, ELL's academic language falls further behind resulting in high dropout rates. The purpose of this research is to find ways in which teachers can help ELLs adjust to academic language. This literature review highlights ELL student backgrounds, the standards and assessments used for ELLs, teacher and ELL interaction, and ways to adjust to academic language in the classroom. Analysis of data suggested that ELLs are not provided with the resources needed to succeed in the mainstream classroom. Synthesis of data also implies that teachers lack the preparation necessary to make the classroom adjustments needed for ELLs to succeed.

Poster Presentation ES P3.7

**ONE-TO-ONE COMPUTERS IN THE CLASSROOM:
ONE SIZE FITS ALL?**

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Students today are considered to be “Digital Natives,” as they are growing up in a technologically rich environment (Prensky, 2010). However, not all children have equal access to technology in and out of the classroom, thus creating the potential for pervasive inequality. This study investigates the role of one-to-one computing implementation in students’ learning experiences and equity and autonomy for students from low-income homes. Four sources of data were collected from twenty-six fifth grade students from primarily low-income homes: field notes, student work samples, student surveys and lesson plans. One-to-one computing enhanced engagement, collaboration, and autonomy and heightened students’ overall achievement and enjoyment across all subject areas. This research underscores the drive for social justice in technology integration as it reveals the essential role computers play in leveling the learning field by providing *all* students opportunities to thrive.