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FRIDAY, APRIL 28, 2017

TRANSFORMATIONS

A Student Research and Creativity Conference

Schedule of Events and Abstracts

Transformations: A Student Research and Creativity Conference

April 28, 2017
Old Main
SUNY Cortland

Schedule of Events

12:30-1:30 p.m.

Keynote Address
Brown Auditorium

"From There to Here"

Michael J. Bond '75, M.D.

Medical Director of Advanced Dermatology
and Cosmetic Surgery
Orlando, Florida

1:45-2:30 p.m.

Concurrent Sessions I

2:30-3 p.m.

Poster Session A

Colloquium (Room 220) and 2nd Floor Atrium

3-4 p.m.

Concurrent Sessions II

4-4:30 p.m.

Poster Session B

Colloquium (Room 220) and 2nd Floor Atrium

4:30-5:30 p.m.

Concurrent Sessions III

Light refreshments will be available 2:30-4:30 p.m. in the first floor main lobby.
PLEASE NOTE: Food and beverages are NOT allowed in classrooms.

*Cover design by Carly Gialanella in
ATS 440: Portfolio Practicum, Spring 2017.*

Transformations: A Student Research and Creativity Conference is an event designed to highlight and encourage scholarship among SUNY Cortland students. Our scholarly work is crucial to who and what we are as individuals and as an institution. This day is an attempt to help our students and the general public understand and appreciate what we do, to draw students into the intellectual life and the excitement of scholarly work, and to publicize the accomplishments of our students.

Presentations will be made by students and faculty mentors. In addition to attendance by members of the campus community, invitations have been extended to area high school students and their advisors, our elected representatives, and to the Cortland community at large.

Support for *Transformations* has been received from the President's Office and the Provost and Vice President for Academic Affairs Office.

Our appreciation to the Transformations Committee:

R. Bruce Mattingly, Arts & Sciences (Chair)

Martine Barnaby, Art and Art History

Connor Berg, Campus Activities

Philip Buckenmeyer, Kinesiology

Patricia Conklin, Biological Sciences

Lisa Mostert, Campus Technology Services

Charlotte Pass, Literacy

Kimberly Rombach, Childhood/Early Childhood Education

Special thanks to Alumni Engagement
for providing volunteers for *Transformations*.

KEYNOTE ADDRESS

12:30-1:30 p.m.

Brown Auditorium

Michael J. Bond '75, M.D.

Michael J. Bond, M.D., a 1975 SUNY Cortland graduate and pediatric dermatologist who has greatly influenced the practice of his medical specialty, is a board-certified physician in pediatrics and dermatology and was the only pediatric dermatology consultant to St. Jude Children's Research Hospital for 20 years.

Since 2003, Bond has served as the medical director of Advanced Dermatology and Cosmetic Surgery, a practice with 100 offices based in Orlando, Fla. It is considered to be the largest dermatology specialty practice in the country. There, he established the largest mid-level dermatology internship in the U.S.

Bond has trained extensively in laser surgery to treat young children with vascular birthmarks. He developed a procedure to surgically remove congenital giant birth moles in infants and young children.

In 2003, Bond established the largest recognized dermatology training program for physician assistants and nurse practitioners in the country. He also served for 21 years as the director of education for the mid-south chapter of the national organization addressing Epidermolysis Bullosa.

Trained by the Association of Clinical Research Professionals, he has conducted extensive clinical research, collecting biological samples on a massive scale for the sake of genetic study and investigating topical treatments for different childhood skin conditions.

Bond became a member of the Society of Pediatric Dermatology in 1981, shortly after this subspecialty of dermatology was formed, and has presented numerous papers at the society's national and international meetings. His topics have included the diagnosis and treatment of rare dermatological disorders, the malignant potential of giant congenital moles and their surgical removal; a revolution in the surgical management of giant congenital moles, painless injections and living with and caring for children with catastrophic skin diseases. Bond also presents at other national dermatology gatherings. His scholarly findings have been published in *Dermatology*, *Pediatrics* and *Psychology*.

Bond established a student-managed medical talk show through Germantown High School in Wisconsin that ran for 16 years on public television. On the show, he and a designated student interviewed medical guests. He has mentored students and lectured at high schools on the importance of maintaining ethics.

Bond became a passionate scuba diver after taking the first scuba diving course ever offered at SUNY Cortland. Since then, he has taken dive trips around the world and conducted field research in marine geology in the Caribbean with Lamont-Doherty Geological Observatory of Columbia University. He also took part in developing the first and most detailed map of the ocean floors.

An accomplished underwater wildlife photographer, Bond's writing has been published in *Marine Geology* and *National Geographic*.

When he graduated magna cum laude from SUNY Cortland in 1975 with his Bachelor of Science in Biological Sciences degree, Bond was only the second alumnus to be directly accepted into an American medical school, in his case the SUNY Upstate Medical University in Syracuse, N.Y. Bond, who grew up in Spring Valley, N.Y., completed his residency in pediatrics at the University of South Florida and his dermatology residency at the University of Tennessee Medical Center.

Before his current appointment in 2003, Bond was in private practice for 19 years in Memphis, Tenn. During this time, he was the dermatologist for St. Jude Children's Research Hospital.

Bond is a diplomate of the American Board of Pediatrics and the American Board of Dermatology. His memberships also include the American Academy of Dermatology.

CONCURRENT SESSIONS I

1:45-2:30 p.m.

Brown Auditorium

Moderator: James Hokanson, Associate Professor, Kinesiology

Usage Profile of Cardio Machines at the Student Life Center: the First Step to Turning Human Power into Electricity

Presenter: Jonathan Thomas, Senior, Exercise Science
Faculty Mentor: Jeffrey Bauer, Kinesiology

Using the Quadmill as a Method of Training to Reduce the Symptoms of Parkinson's Disease

Presenters: Maura Mills, Senior, Exercise Science
Peter Voorhees, Senior, Exercise Science
Jillian Leggiro, Freshman, Biomedical Sciences
Jessica Degina, Senior, Exercise Science
Faculty Mentor: Jeffrey Bauer, Kinesiology

Elevated AlterG Treadmill Temperature during Exercise: an Environmental Constraint

Presenter: Casey Austin, Graduate, Exercise Science
Faculty Mentor: James Hokanson, Kinesiology

Room G-09

*Moderator: Christopher McRoberts, Distinguished Professor, Geology;
Director, Undergraduate Research Council*

***Reviving the Art and Science of Azul Maya Ceramics**

Presenter: Kelly McKenna, Senior, Art History
Faculty Mentor: Jeremiah Donovan, Art and Art History

***Examining the Gender Wage Gap**

Presenter: Alyssa Smeding, Senior, Business Economics/Human Resource Management
Faculty Mentor: Kathleen Burke, Economics

***Çadır Höyük: Stability or Change at the End of the Hittite Empire?**

Presenter: Anna Gorall, Junior, Archaeology/International Studies
Faculty Mentor: Sharon Steadman, Sociology/Anthropology

* Denotes students who received 2016 Undergraduate Research Council Summer Research Fellowships.

Room G-25

*Moderator: Laura Davies, Assistant Professor, English;
Director, Writing Programs*

2016 Outstanding Writing Awards

The House at 4 Crawford St.

Presenter: James David Warner, Senior, History
Faculty Mentor: Randi Storch, History

300 Lanterns

Presenter: Sheila Gustafson, Graduate, Adolescence English Education
Faculty Mentor: Laura Davies, English

The Politics of Misogyny

Presenter: Sara Sampson, Junior, Professional Writing
Faculty Mentor: Kevin Rutherford, English

Fake News Manipulate the Public

Presenter: Jamie-Lee Minkley, Sophomore, Communication Studies
Faculty Mentor: Gailanne Mackenzie, English

Coming Times

Presenter: Jahniece McCollum, Junior, Professional Writing
Faculty Mentor: Bernard Earley

The Flower

Presenter: Christina Langer, Junior, Sociology
Faculty Mentor: Mario Hernandez, English

Men's Eyes Were Made to Look: the Cinematic Circumscription of Juliet's Body in Two Adaptations of *Romeo and Juliet*

Presenter: Joseph Mogavero, Senior, Adolescence English Education

POSTER SESSION A

2:30-3 p.m.

Colloquium (Room 220) and 2nd Floor Atrium

Phylogenetic Considerations of Invasive Terrestrial Flatworms in the Genus *Bipalium*

Presenter: Timothy Duerr, Senior, Biology
Faculty Mentors: Peter Ducey, Biological Sciences
Patricia Conklin, Biological Sciences

Structural and Biochemical Characterization of 6-Hydroxynicotinic Acid 3-Monooxygenase

Presenter: Vladimir Leshkevich, Senior, Biology/Biochemistry
Faculty Mentor: Katherine Hicks, Chemistry

Structure Determination of a Family of Bioactive Lipids Isolated from the Larvae of the Argentine Cactus Moth, *Cactoblastis cactorum*

Presenters: Danielle Cervasio, Senior, Biology
Tyler Schwertfeger, Junior, Chemistry
Faculty Mentor: Frank Rossi, Chemistry

Using LC-MS/MS Proteomic Techniques to Investigate Hexanoic Acid Production from a Diverse Microbial Community Exhibiting a Reverse Beta Oxidation Pathway

Presenter: Kristen Kircher, Junior, Biochemistry
Faculty Mentor: Jeffrey Werner, Chemistry

An Examination of How the Portrayal of Psychopaths in Comedic and Dramatic Movies Align with the Clinical Definition of Psychopathy

Presenters: Marguerite Ammerman, Sophomore, Psychology
Antonia Marsala, Junior, Psychology
Alexandra Frederick, Senior, Psychology
Faculty Mentor: Karen Davis, Psychology

The Influence of Geosocial Networking Apps (GSNs) on College Student Sexual Risk Behavior

Presenters: Taylor Gordon, Senior, Psychology
Ellen Beckwith, Senior, Psychology
Tiffany Soto, Senior, Psychology
Faculty Mentor: Katherine Bonafide, Psychology

Electroencephalography during Behavioral Observation as a Predictor of Accuracy in Personality Judgement

Presenters: Alyssa Cino, Senior, Psychology
Christy Brewer, Senior, Psychology
Stefania Buta, Senior, Psychology
Jeremy Collings, Freshman, Conservation Biology
Candice Jaimungal, Senior, Psychology
Lindsey LeClair, Senior, Psychology
Marla Hairston, Sophomore, Psychology
Faculty Mentors: Leslie Eaton, Psychology
Raymond Collings, Psychology

Effects of Environmental Scenery on Resiliency and Recovery Using EEG

Presenters: Lindsey LeClair, Senior, Psychology
Jeremy Collings, Freshman, Conservation Biology
Stefania Buta, Senior, Psychology
Michael Staversky, Senior, Psychology
Alyssa Cino, Senior, Psychology
Christy Brewer, Senior, Psychology

Faculty Mentor: Leslie Eaton, Psychology

Are ADHD Screeners Safe to Use?

Presenter: Kristin Spedden, Senior, Psychology

Faculty Mentor: Benjamin J. Lovett, Psychology

The Effect of Environmental Enrichment on Nicotine Primed Ethanol Consumption in Male and Female Rats

Presenters: Makenzie Schrader, Senior, Biomedical Sciences
Morgan Christie, Senior, Psychology
Kaleigh Richer, Senior, Psychology
Morghen Axtell, Senior, Psychology

Faculty Mentor: Joshua Peck, Psychology

Using Technology with Heart

Presenters: Gina Parrino, Senior, Childhood/Early Childhood Education
Shelby Ingrassia, Senior, Childhood/Early Childhood Education
Gretchen Krzykowski, Senior, Childhood/Early Childhood Education

Faculty Mentor: Shufang Strause, Childhood/Early Childhood Education

Voice Use Awareness Among Undergraduate Communication Disorders and Sciences Students

Presenter: Emma Triolo, Senior, Speech and Hearing Science

Faculty Mentor: Irena Vincent, Communication Disorders and Sciences

***Equity Valuation Model for Apple, Inc.**

Presenter: Patrick Viscome, Senior, Business Economics

Faculty Mentor: Timothy Phillips, Economics

* Denotes students who received 2016 Undergraduate Research Council Summer Research Fellowships.

CONCURRENT SESSIONS II

3-4 p.m.

Room 120

Moderator: Timothy Delaune, Assistant Professor, Political Science

Moot Court Oral Argument Demonstration: *DeNolf v. Olympus*

Presenters: Michael Braun, Senior, Political Science
Kayla Ernise, Senior, Political Science
Matthew Mavrogian, Junior, Political Science
Tyler Savino, Senior, Political Science

Faculty Mentor: Timothy Delaune, Political Science

Room 209

Moderator: Mark Sutherlin, Assistant Professor, Kinesiology

Do Lower Body Positive Pressure Treadmills Influence the Stride Length of Individuals with Lower Body Skeletal Asymmetry?

Presenter: Eli Feathers, Senior, Exercise Science

Faculty Mentor: Mark Sutherlin, Kinesiology

Effect of Exercise Intensity on Speech, Psychological, and Physiological Measures

Presenter: Sarah Fuller, Senior, Speech and Hearing Sciences

Faculty Mentors: Eileen Gravani, School of Professional Studies
Erik Lind, Kinesiology
Kevin Dames, Kinesiology

The Relationship between Physical Activity Patterns and Nutritional Knowledge

Presenters: Jonathan Thomas, Senior, Kinesiology
Shannon Daly, Senior, Kinesiology

Faculty Mentors: Deborah VanLangen, Kinesiology
Katherine Polasek, Kinesiology

Room 230

Moderator: Mark Dodds, Professor, Sport Management

Concussions in Sports

*Presenters: Ayana Flores, Junior, Sport Management
Drazen Zack, Senior, Sport Management
Jack Travers, Junior, Sport Management
Andrew Goldblatt, Sport Management*

Faculty Mentor: Mark Dodds, Sport Management

Generating Fractal Images Using Iterated Function Systems

Presenter: Matthew Metcalf, Senior, Mathematics/Physics

Faculty Mentor: Isa Jubran, Mathematics

The Implications of Popular Media's Portrayal of Psychopathy for Mental Health Professionals Working in the Legal Arena

Presenter: Matthew McLain, Senior, Psychology

Faculty Mentor: Karen Davis, Psychology

Room G-24

Moderator: Scott Moranda, Associate Professor, History

Undergraduate Research in History

A Controversial History: The Integration of Schools in Buffalo, NY

Presenter: Claire Leggett, Junior, History/Art History

Faculty Mentor: Gigi Peterson, History

84679: Finding the Voice amongst the Crowd, Interning with KHRCA

Presenter: Gillian Farnan, Junior, History

Faculty Mentor: Gigi Peterson, History

The House at 4 Crawford Street: Espionage and Anti-Communist Panic in Senator Lusk's Hometown.

Presenter: James Warner, Senior, History

Faculty Mentor: Randi Storch, History

Room G-12

*Moderator: Christopher McRoberts, Distinguished Professor, Geology;
Director, Undergraduate Research Council*

***Bryophytes of Hoxie Gorge**

*Presenter: Adam Hocking, Senior, Biology
Faculty Mentor: Timothy Baroni, Biological Sciences*

***Examination of Biodegradable Jute Matting as a Management Option for the Invasive Aquatic Plant, Variable-Leaf Milfoil (*Myriophyllum heterophyllum*)**

*Presenter: Quintin Casella, Senior, Conservation Biology
Faculty Mentor: Angela M. Pagano, Biological Sciences*

***Emergency Contraceptive Dispensation in College Health Centers**

*Presenter: Caitlin Rasefske, Senior, Exercise Science
Faculty Mentor: Jena Nicols Curtis, Health*

***Run Economy of Trained Endurance Runners on the Lower Body Positive Pressure Treadmill**

*Presenter: Allison Schumann, Senior, Exercise Science
Faculty Mentor: James Hokanson, Kinesiology*

* Denotes students who received 2016 Undergraduate Research Council Summer Research Fellowships.

POSTER SESSION B

4-4:30 p.m.

Colloquium (Room 220) and 2nd Floor Atrium

Taxonomy of New Bacterial Species, *Spirosoma*-like #209, from Cortland Tap Water

Presenters: Ayomide Ola, Senior, Biomedical Sciences

Brittany Aragona, Senior, Biology

Faculty Mentor: Christa Chatfield, Biological Sciences

A Study of the Relationship between the Proteins VTC3 and GME in the Arabidopsis Ascorbic Acid Biosynthetic Pathway

Presenter: Melanie van Vliet, Senior, Biology

Faculty Mentor: Patricia Conklin, Biological Sciences

The Use of DivIVA to Confirm the Interaction between Two Arabidopsis Proteins (GME and VTC3) Involved in the Synthesis of Ascorbic Acid in Plants

Presenter: Kayla Skinner, Junior, Biology

Faculty Mentor: Patricia Conklin, Biological Sciences

White-tailed Deer and Invasive Earthworms: How Do They Affect New York Ecosystems?

Presenters: Gabriella Cerrati, Senior, Conservation Biology

Kaila Babcock, Senior, Biology

Faculty Mentor: Andrea Davalos, Biological Sciences

Predation Behavior of Invasive Species *Bipalium adventitium*

Presenters: Emily Stronggreen, Senior, Biology

Carly Markowitz, Senior, Biology

Faculty Mentor: Peter Ducey, Biological Sciences

The Role of the Innate Immune System in Controlling JC Polyomavirus Infectivity, as Determined Using the CRISPR/Cas9 System

Presenters: Corrine Edick, Senior, Biology

Elise Sedlacek, Senior, Biology

Faculty Mentor: Christian Nelson, Biological Sciences

Characterization of the Effects of an Optimized Antiviral Compound on JC Polyomavirus Infectivity

Presenter: Tashania Treasure, Junior, Biomedical Science

Faculty Mentor: Christian Nelson, Biological Sciences

Construction of a Low-Cost Fluorescent Microscope for Use in Undergraduate Teaching Laboratories

Presenter: Peter Voorhees, Senior, Biology/Exercise Science

Faculty Mentor: Christian Nelson, Biological Sciences

Kinetic Characterization of Two Variant Enzymes of *Campylobacter jejuni* Arginine Deiminase

Presenters: Ashley Jackson, Senior, Biochemistry

Anna Szostek, Senior, Biology

Faculty Mentor: Katherine Hicks, Chemistry

Analyzing the Volumetric Core-to-Rim Ratio of Chondrules with Fine-Grained Rims

Presenters: Andrew Duval, Junior, Chemistry

Adam Vodicka, Senior, Biology

Faculty Mentor: Melissa Morris, Physics

Language as a Tool for Empowering Individuals with Disabilities

Presenter: Fiona Hayden, Junior, Inclusive Special Education

Faculty Mentor: Carrie Rood, Foundations and Social Advocacy

Wearing Multiple Hats: Master's Candidates' Action Research to Improve Teaching and Learning in the Professional Development School

Presenters: Kelsey Bennett, Graduate, MST Childhood Education

Torrie VanDerzee, Graduate, MST Childhood Education

Alexis Crawford, Graduate, MST Childhood Education

Douglas LaFlamme, Graduate, MST Childhood Education

Julia T. Moore, Graduate, MST Childhood Education

Cora Moyer, Graduate, MST Childhood Education

Mai T. Nguyen-Vo, Graduate, MST Childhood Education

Jessie M. Nye, Graduate, MST Childhood Education

Kristen Marie Owens, Graduate, MST Childhood Education

Eric Pacicca, Graduate, MST Childhood Education

Parveen E. Paul, Graduate, MST Childhood Education

Emilie V. Sullivan, Graduate, MST Childhood Education

Inna Yanchuk, Graduate, MST Childhood Education

Faculty Mentors: Cynthia J. Benton, Childhood/Early Childhood Education, MST Coordinator

Muteb Alquatani, Childhood/Early Childhood Education

Krystal Barber, Childhood/Early Childhood Education

Jeanne Galbraith, Childhood/Early Childhood Education

Beth Klein, Childhood/Early Childhood Education

Lin Lin, Childhood/Early Childhood Education

Joy Mosher, Childhood/Early Childhood Education

Charlotte Pass, Literacy

Shufang Shi Strause, Childhood/Early Childhood Education

Susan Stratton, Childhood/Early Childhood Education

Kimberly Wieczorek, Childhood/Early Childhood Education

Orvil White, Childhood/Early Childhood Education

CONCURRENT SESSIONS III

4:30-5:30 p.m.

Room 120

*Moderator: Mecke Nagel, Professor, Philosophy;
Director, Center for Gender and Intercultural Studies*

Black Feminist Perspectives on Education, Media, and Black Lives Matter

*Presenters: Nicole Daniel, Senior, Communication Studies
Jacob Wright, Junior, Social Philosophy/Africana Studies
Stephanie Hector, Senior, Childhood/Early Childhood Education
Jocenelle Sarah Alcime, Senior, Inclusive Childhood Education*

Faculty Mentor: Mecke Nagel, Philosophy

Room 121

Moderator: Evan Faulkenbury, Assistant Professor, History

Cortland Student Newspapers, 1879-2016

*Presenters: William McNeill, Junior, History
Brendan Woods, Junior, History
Daniel Bankert, Junior, History*

Faculty Mentor: Evan Faulkenbury, History

State of Officiating

Presenter: Jason Blayda, Senior, Sport Management

Faculty Mentor: Mark Dodds, Sport Management

BeYOUtiful: Body Image in the Media

*Presenters: Jessie Espinet, Junior, Therapeutic Recreation
Marisa Lobelson, Senior, Therapeutic Recreation*

Faculty Mentor: Susan Barnett, Recreation, Parks and Leisure Studies

Room 209

Moderator: Ryan Fiddler, Assistant Professor, Kinesiology

No Effect of Acute Beetroot Juice Supplementation on Moderate and Vigorous Intensity Aerobic Exercise

*Presenters: Nathaniel Ashton, Graduate, Exercise Science
Nicole Lindel '16, Exercise Science*

Faculty Mentor: Ryan Fiddler, Kinesiology

Dominant and Non-Dominant Motor Competence, Physical Activity, and Physical Fitness among College Students

Presenter: Patrick Brown, Senior, Exercise Science

Faculty Mentor: Larissa True, Kinesiology

Room G-09

Moderator: Geoffrey Bender, Assistant Professor, English

Researching with the Modern Student

*Presenters: Breanna Soutar, Senior, Adolescent English Education
Emelda Bonilla, Junior, Adolescent English Education
Jenni Diaz, Senior, Adolescent English Education
Shelby Roberts, Senior, Adolescent English Education*

Faculty Mentor: Geoffrey Bender, English

Mind Over Terror Anxiety Regulations Training Through a Biofeedback-Mediated Horror Game

Presenter: Morgan Christie, Senior, Psychology/Professional Writing

Faculty Mentor: Kevin Rutherford, English

Room G-12

*Moderator: Christopher McRoberts, Distinguished Professor, Geology;
Director, Undergraduate Research Council*

***Analysis of Legionella Pneumophila Attachment to Biofilms of Other Bacterial Species**

Presenter: Cassidy Sauer, Senior, Biology

Faculty Mentor: Christa Chatfield, Biological Sciences

*** Neuroprotective Effect of Stem Cells**

Presenter: Joseph Hannett, Senior, Biomedical Sciences

Faculty Mentor: Theresa Curtis, Biological Sciences

***Profiles of Psychological Resilience: Electroencephalography of Fixation, Emotional Challenge, and Recovery**

Presenter: Stefania Buta, Senior, Psychology

Faculty Mentor: Leslie Eaton, Psychology

* Denotes students who received 2016 Undergraduate Research Council Summer Research Fellowships.

Abstracts

KEYNOTE ADDRESS

12:30-1:30 p.m.

“From There to Here”

Michael J. Bond '75, M.D.

During my speech, I will talk about the “Good Ole Days” of Undergraduate Independent Research at SUNY Cortland and the positive effects on students, faculty and how research helped launch our professional careers. I will also discuss how the lessons I learned from doing research guided me in making my crucial decisions which dominates my career.

CONCURRENT SESSIONS I

1:45-2:30 p.m.

Usage Profile of Cardio Machines at the Student Life Center: the First Step to Turning Human Power into Electricity

Jonathan Thomas, Senior, Exercise Science

Jeffrey Bauer, Kinesiology

Who uses the cardio machines at the Student Life Center (SLC) and why do we care? With the right equipment a portion of the human energy expended using standard cardio machines can be captured and turned into electricity. Before we seek funding to retro fit the cardio machines in the SLC we must first determine whether the machines are used enough to make the retro fitting worthwhile. Anecdotally, the cardio machine use is dominated by females. This study recorded who, when, and what cardio machines are commonly used in the SLC. Data were not recorded continually but at 15 minute intervals during random 2 hour blocks throughout operating hours of the SLC. Data collection continues and results will show cardio machine usage history.

Using the Quadmill as a Method of Training to Reduce the Symptoms of Parkinson's Disease

Maura Mills, Senior, Exercise Science

Peter Voorhees, Senior, Exercise Science

Jillian Leggiero, Freshman, Biomedical Sciences

Jessica Degina, Senior, Exercise Science

Jeffrey Bauer, Kinesiology

To fully understand both the training and research aspects of a study with Parkinson's patients, student researchers volunteered to participate in a 1 month study where they performed as both researcher and study participant. Central to the project is the Quadmill, a unique exercise machine that extends and flexes the major joints of the lower body while the person maintains an upright static posture of the body above the hips. It provides a high intensity, low impact, lower body workout in a short period of time. Training sessions consisted of baseline measurements of heart rate, blood pressure, standing balance with eyes closed, standing balance with eyes open, gait initiation, completion a 7 meter walking trial with a 180 degree turn at the 3.5 meter mark, followed by three 45 second trials on the Quadmill with two minutes rest then a repeat of the baseline measurements. Results are forthcoming.

Elevated AlterG Treadmill Temperature during Exercise: an Environmental Constraint

Casey Austin, Graduate, Exercise Science

James Hokanson, Kinesiology

Lower body positive pressure (LBPP) treadmills have become increasingly popular with individuals for rehabilitation and training. A LBPP treadmill entails sealing the body from the hips down in a tent to simulate exercise at lower body weight. This tent could be considered an environmental constraint in several ways, however its effects on performance, has not been explored.

PURPOSE: Measure temperature changes running on LBPP treadmill. **METHODS:** Fifteen trained endurance athletes, 7 males and 8 females, completed four running trials at different body weight percentage levels (60%, 75%, 85%, 100%). During each trial participants ran at three steady state speeds (2.9, 3.4, and 3.8 m·s⁻¹) for four minutes each. Room air, tympanic, and LBPP chamber temperatures (°C) were recorded before and after each trial. **RESULTS:** The average LBPP treadmill chamber (±SD) pre-run temperature was 27.3±3.8°C. Average post run temperature was 29.5±4.3°C. Average (±SD) change in treadmill chamber temperature was 2.3±1.5°C.

***Reviving the Art and Science of Azul Maya Ceramics**

Kelly McKenna, Senior, Art History

Jeremiah Donovan, Art and Art History

During the Classic Period (300-900 CE), the Maya culture of Mesoamerica created a sky-blue pigment, impervious to harsh burial conditions, known as Maya Blue. During rituals, this colorant, representing water, was applied to polychrome pottery honoring the Rain God Chaac. Our research examined clay materials (Palygorskite) and indigo dye from different geographic locations, comparing and contrasting the composition to the original Maya Blue. Pottery vessels were created in the Maya tradition from locally sourced clay and the pigment was applied post-firing. The results of the project, incorporating organic and inorganic materials, provided insight into the making and application of Maya Blue from an Archaeologist's and Artist's perspective. Findings of this research were displayed in the National Endowment for the Arts Exhibition, *Future of the Past*, at the Dowd Art Gallery in October-December 2016.

***Examining the Gender Wage Gap**

Alyssa Smeding, Senior, Business Economics/Human Resource Management

Kathleen Burke, Economics

With the current proactivity towards women's rights and the gender wage gap, it is essential to truly understand what the wage gap is, where it is most prevalent and what factors affect it. This research project utilizes data from the Bureau of Labor Statistics to examine wage discrepancies in the U.S. over time and across several industries while simultaneously exploring the impact of occupational sex segregation on the wage gap using the index of dissimilarity. By outlining what the index of dissimilarity is and why it is useful, we define both the benefits and limitations of the index on wage gap studies. In addition, we further define which factors have an effect on the gender pay gap by examining trends in worker characteristics and their impact on the gap within each industry in 2015. The combination of these studies will aid us in gaining a better understanding of what is influencing the wage gap in the U.S.

*Çadır Höyük: Stability or Change at the End of the Hittite Empire?

Anna Gorall, Junior, Archaeology/International Studies

Sharon Steadman, Sociology/Anthropology

The Hittite Empire, in ancient Turkey, fell at approximately 1200 BCE after a long and prosperous reign. However, there has been a noticeable lack of research on the impact the fall of the empire had on smaller surrounding villages. The archaeological site Çadır Höyük, located on the central Anatolian (Turkish) Plateau, was at one time one of the villages that traded goods with the Empire. This presentation will explore the changes that took place in the village after the fall of the Hittites based primarily on ceramic analysis conducted at the site during the summer of 2016. Results of the data collection and analysis provides an interpretation regarding how residents coped with the fall of the empire post-1200 BCE and may be indicative of the fate of other small towns surrounding the Empire.

* Denotes students who received 2016 Undergraduate Research Council Summer Research Fellowships.

2016 Outstanding Writing Awards

The House at 4 Crawford St.

James David Warner, Senior, History

Randi Storch, History

Awarded the prize for Academic Writing

300 Lanterns

Sheila Gustafson, Graduate, Adolescence English Education

Laura Davies, English

Awarded the prize for Creative Nonfiction.

The Politics of Misogyny

Sara Sampson, Junior, Professional Writing

Kevin Rutherford, English

Awarded the prize for Media.

Fake News Manipulate the Public

Jamie-Lee Minkley, Sophomore, Communication Studies

Gailanne Mackenzie, English

Awarded the prize for Academic Writing from CPN Course.

Coming Times

Jahniece McCollum, Junior, Professional Writing

Bernard Earley

Awarded the prize for Poetry

The Flower

Christina Langer, Junior, Sociology

Mario Hernandez, English

Awarded the prize for Fiction.

Men's Eyes Were Made to Look: the Cinematic Circumscription of Juliet's Body in Two Adaptations of *Romeo and Juliet*

Joseph Mogavero, Senior, Adolescence English Education

Awarded the prize for Non-Course Writing.

POSTER SESSION A

2:30-3 p.m.

Phylogenetic Considerations of Invasive Terrestrial Flatworms in the Genus *Bipalium*

Timothy Duerr, Senior, Biology

Peter Ducey, Biological Sciences

Patricia Conklin, Biological Sciences

The North American invasion of flatworms in the genus *Bipalium* was first reported in the late 19th century. Endemic to Asia, these flatworms affect ecosystems through their extensive predation of native annelids (earthworms). Previous reports have suggested that four *Bipalium* species have invaded North America: *B. adventitium*, *B. kewense*, *B. pennsylvanicum*, and *B. vagum*. Because three of these taxa are found only in North America, the question remains open whether the U.S. flatworms actually are four distinct species or just one species with much variation. To address this question, DNA from the four putative species was collected using a phenol-chloroform extraction. The genes for 18S ribosomal RNA (nuclear gene) and for cytochrome c oxidase I (mitochondrial gene) were sequenced for each species and were used to create a phylogenetic hypothesis regarding the species' relatedness. These data suggest that all four taxa are distinct, monophyletic species, corroborating previous reports.

Structural and Biochemical Characterization of 6-Hydroxynicotinic Acid 3-Monooxygenase

Vladimir Leshkevich, Senior, Biology/Biochemistry

Katherine Hicks, Chemistry

Along with countless other pollutants, *N*-heterocyclic (MHACs) compounds are a major problem due to the prevalence of MHACs in solvents, dyes and pharmaceuticals. These compounds enter the environment in many different ways, and decontamination is very difficult. MHACs are also carcinogenic and present in petroleum products. The genes coding for 6-Hydroxynicotinic Acid 3-Monooxygenase (NicC), a protein found in the bacteria *Bordetella bronchiseptica* and *Pseudomonas putida*, have been isolated and cloned. NicC is responsible for the conversion of 6-hydroxynicotinic acid to 2,5-dihydroxypyridine. Previously, we have characterized NicC using X-ray diffraction and biochemical assays. In this work, we are characterizing the activity of *P. putida* NicC with a variety of substrate analogs. This work is ongoing and should result in an understanding of the basis for substrate specificity.

Structure Determination of a Family of Bioactive Lipids Isolated from the Larvae of the Argentine

Cactus Moth, *Cactoblastis cactorum*

Danielle Cervasio, Senior, Biology

Tyler Schwertfeger, Junior, Chemistry

Frank Rossi, Chemistry

The caterpillar, *Cactoblastis cactorum*, is considered to be an invasive species in the southern part of the United States. Its western migration poses a threat to its substrate, the *Optunia* cactus, which is a staple food in Mexico. Bioactive compounds that have been isolated from the caterpillar are assumed to have multiple double bond positions. These compounds have been analyzed by liquid chromatography coupled with mass spectrometry. The compounds have been compared to synthetic and isolated standards that display unique fragmentation patterns in the mass spectrometer using collision induced dissociation. Using the data previously collected, we are able to determine the position of the double bond in each fatty acid chain based off of their fragmentation patterns. By HPLC-MS analysis, we know that there are many similar compounds present in the mandibular glands of *Cactoblastis cactorum*, and we believe that we can deduce their structures using this method.

Using LC-MS/MS Proteomic Techniques to Investigate Hexanoic Acid Production from a Diverse Microbial Community Exhibiting a Reverse Beta Oxidation Pathway

Kristen Kircher, Junior, Biochemistry

Jeffrey Werner, Chemistry

Producing a serviceable fuel source from biomass waste is a very profitable and environmentally conscious alternative compared to using fossil fuels. Proteomic techniques were utilized to extract protein from samples collected from three separate hexanoic acid producing bioreactors. The bioreactors serve the purpose of working to produce a diverse microbial community that exhibits a reverse beta-oxidation pathway. The protein extracted from the three separate bioreactors was processed to be purified and analyzed using the method of an LC-MS/MS proteomic analysis. Data collected from the results shown from the analysis were then compared to an organized metagenomic database formulated to list all known bacterial organisms, as well as all organisms included in the domain Archaea. In doing so, the bacterial organisms expressing the specific enzymes crucial to the formation of hexanoic acid will be identified.

An Examination of How the Portrayal of Psychopaths in Comedic and Dramatic Movies Align with the Clinical Definition of Psychopathy

Marguerite Ammerman, Sophomore, Psychology

Antonia Marsala, Junior, Psychology

Alexandra Frederick, Senior, Psychology

Karen Davis, Psychology

Research has shown the term psychopath may bias jurors against defendants and that the use of the term in legal proceedings may result in harsher sentences. One concern regarding the use of this term in legal proceedings is that jurors' understandings of psychopathy may be influenced by popular culture's portrayal of the term rather than the clinical definition of psychopathy. However, research has not formally examined how media portrays psychopathy. The current study will examine how psychopathy is portrayed in two genres of movies to determine the extent to which the portrayals of psychopathy in movies align with the clinical definition of psychopathy. Additionally, this study will compare the portrayals of psychopathy across comedic and dramatic movies to determine whether individuals' understandings of psychopathy may depend on the type of media to which they are exposed.

The Influence of Geosocial Networking Apps (GSNs) on College Student Sexual Risk Behavior

Taylor Gordon, Senior, Psychology

Ellen Beckwith, Senior, Psychology

Tiffany Soto, Senior, Psychology

Katherine Bonafide, Psychology

In the current digital age, technology has arguably made "hooking up" more easily and quickly accessible. Geosocial networking (GSN) applications (apps; e.g., Tinder, Grindr) have facilitated this trend. Coincidentally, chlamydia, gonorrhea, and syphilis have increased for the first time since 2006. Previous research indicates a possible link between GSN app use and the observed spike in STI incidence. However, more research needs to be done using diverse at-risk samples. Hence, the proposed study will examine the relationship between GSN use and engagement in risky sexual behaviors among college students. We will use a survey method to assess GSN use and risky sexual behavior including potential moderators of this association such as perceived social and family support, personality, and engagement in other risky health behaviors (e.g., substance abuse). Findings from the proposed study could help inform public health efforts in preventing STI transmission especially on college campuses.

Electroencephalography during Behavioral Observation as a Predictor of Accuracy in Personality Judgement

Alyssa Cino, Senior, Psychology

Christy Brewer, Senior, Psychology

Stefania Buta, Senior, Psychology

Jeremy Collings, Freshman, Conservation Biology

Candice Jaimungal, Senior, Psychology

Lindsey LeClair, Senior, Psychology

Marla Hairston, Sophomore, Psychology

Leslie Eaton, Psychology

Raymond Collings, Psychology

This study focuses on the role of attention in the formation of accurate personality judgments. We hypothesized that attention (theta/beta ratio) in the central-parietal regions measured using EEG will be associated with accuracy (self-other agreement), and hypothesized that an inconsistent vigilance would result in lower accuracy of personality judgement. We discovered a significant association among theta/beta ratio measurements taken during the time a target was viewed and subsequent distinctive accuracy scores. Ultimately, neuropsychological studies of social judgment will inform clinical interventions aimed at improving the quality of life for individuals with attention problems.

Effects of Environmental Scenery on Resiliency and Recovery Using EEG

Lindsey LeClair, Senior, Psychology

Jeremy Collings, Freshman, Conservation Biology

Stefania Buta, Senior, Psychology

Michael Staversky, Senior, Psychology

Alyssa Cino, Senior, Psychology

Christy Brewer, Senior, Psychology

Leslie Eaton, Psychology

In this study, we experimentally test the hypotheses that exposure to natural scenery (nature scenes) increases positive emotion, provides an emotional buffer when exposed to negative scenery (negative life events), and increases positive emotion after exposure to negative scenery. Electroencephalograph measurements of hemispheric asymmetry is used as an objective measure of positive emotional valence. We found that viewing nature scenery produced greater positive (approach-related) responses, results that have implications for wellness programs and psychological interventions.

Are ADHD Screeners Safe to Use?

Kristin Spedden, Senior, Psychology

Benjamin J. Lovett, Psychology

Many colleges conduct screenings of the general college student population for psychological disorders, such as depression and ADHD. Students are asked to complete brief questionnaires or to respond to interview questions. Although screenings can be the first step in a helpful referral to a full diagnostic evaluation, they may also change how students perceive their own symptoms. In the present study, we randomly assigned 157 college students to either receive a brief screening of ADHD symptoms or not. Then, all students completed a full battery of measures that could be included in a diagnostic evaluation: a lengthy rating scale of ADHD symptoms as well as a series of objective tests requiring sustained attention. The effect of ADHD screenings on each of the other measures was examined. We discuss these results as well as the implications for screening initiatives on college campuses.

The Effect of Environmental Enrichment on Nicotine Primed Ethanol Consumption in Male and Female Rats

Makenzie Schrader, Senior, Biomedical Sciences

Morgan Christie, Senior, Psychology

Kaleigh Richer, Senior, Psychology

Morghen Axtell, Senior, Psychology

Joshua Peck, Psychology

Nicotine and alcohol are the two most commonly abused drugs worldwide and account for over 9 million deaths per year combined. Studies in human populations consistently demonstrate an interaction between nicotine and ethanol abuse. In fact, chronic nicotine use activates stress/reward-related brain regions that facilitate compulsive alcohol drinking. Unfortunately, medications for the co-substance abuse of nicotine and alcohol have fallen short of supporting long-term abstinence. One potential treatment strategy that could help sustain long-term nicotine and alcohol abstinence is Environmental Enrichment (EE). We examined if the implementation of EE after nicotine primed (administered nicotine injections, 0.08 mg/kg) ethanol self-administration training will significantly reduce continued ethanol consumption (abstinence) in male and female rats. We found that EE significantly reduced ethanol consumption for male and female rats after both protracted abstinence periods (7 and 30 days) during the 1-hr relapse test. The results suggest that enriched life conditions are important in facilitating long-term abstinence in nicotine and alcohol co-substance abuse.

Using Technology with Heart

Gina Parrino, Senior, Childhood/Early Childhood Education

Shelby Ingrassia, Senior, Childhood/Early Childhood Education

Gretchen Krzykowski, Senior, Childhood/Early Childhood Education

Shufang Strause, Childhood/Early Childhood Education

“Today, we live in a technology and media-driven environment, marked by access to an abundance of information, rapid changes in technology tools and the ability to collaborate and make individual contributions on an unprecedented scale” (Partnership for 21st Century Skills, 2009). As teacher candidates of K-6 classrooms, learning to appropriately and meaningfully integrate technology into elementary curricula to engage children and improve learning becomes critical. To achieve the competencies, we teacher candidates need not only to know how to use a big variety of technology tools, but also have the right mindset: conceptual understanding towards critical medial literacy. This poster will show you the learning activities we have designed for our future elementary classrooms using a big variety of digital tools: Videolicious, Voice Thread, iMove, Edmodo, Show and Tell, Seesaw, GAFE – Google Apps for Education, and much more.

Voice Use Awareness Among Undergraduate Communication Disorders and Sciences Students

Emma Triolo, Senior, Speech and Hearing Science

Irena Vincent, Communication Disorders and Sciences

The purpose of this study was to determine if undergraduate students majoring in Communication Disorders and Sciences have an accurate awareness of their own voice use. Two groups participated: Group 1 consisted of 18 students that had not yet taken the required course of Voice Disorders, while Group 2 consisted of 18 students who had already taken the course. All participants completed a questionnaire to self-assess whether or not they use voice behaviors that could potentially lead to the development of a voice disorder. Subsequently, each participant's voice was assessed by a clinician trained to conduct a perceptual voice screening. The data collected by the self-assessment questionnaire and the voice screening will be analyzed and compared to determine if taking the Voice Disorders course increased students' awareness of (in)adequate voice use.

***Equity Valuation Model for Apple, Inc.**

Patrick Viscome, Senior, Business Economics

Timothy Phillips, Economics

Investment professionals are often faced with a difficult and often perplexing task of determining what an asset is worth. Their conclusions form the basis of many investment decisions making it a quintessential component for investors to perform well. However, this is often a complex and difficult task for novice investors without a finance and accounting background. This research project aims to aid investors in their valuation efforts through creating an intrinsic value index. An investor will simply have to adjust a series of toggles on their expectation of stock performance being – below-average, average, or above average –and the model will update to match their selection and provide a reasonable price to pay for the stock under analysis. Ultimately, this research project will aid investors in making better investment decisions and safeguard investors from confusing investing with speculation.

* Denotes students who received 2016 Undergraduate Research Council Summer Research Fellowships.

CONCURRENT SESSIONS II

3-4 p.m.

Moot Court Oral Argument Demonstration: *DeNolf v. Olympus*

Michael Braun, Senior, Political Science

Kayla Ernisse, Senior, Political Science

Matthew Mavrogian, Junior, Political Science

Tyler Savino, Senior, Political Science

Timothy Delaune, Political Science

This demonstration consists of an introduction and explanation of what the audience will observe, followed by forty minutes of simulated oral argument on a case involving voting rights and voter qualifications imposed by a fictitious state as though made before the US Supreme Court on appeal. Each student will argue for ten minutes while being questioned by the endorsing faculty member/faculty mentor acting in the role of appellate judge. Each student's goal is to make the most convincing legal arguments possible to support his or her side of the case.

Do Lower Body Positive Pressure Treadmills Influence the Stride Length of Individuals with Lower Body Skeletal Asymmetry?

Eli Feathers, Senior, Exercise Science

Mark Sutherlin, Kinesiology

Leg length discrepancies affect 70% of the population, and can have unknown and seemingly random success from surgical correction. The leading non-surgical strategy is shoe inserts or other such orthotics, which can be uncomfortable or have low patient acceptance rates. One of the newer types of machines in the rehabilitation world is a lower body positive pressure treadmill (LBPTT), which allows a user to ambulate under the condition of a lower body weight. Users will experience lower ground reaction forces, as well as core stabilization. Walking kinematics are like a normal treadmill until the user's body weight is below 85% of standing weight. It is the intent of this research to discover if the LBPTT effects the users step length. Our belief is that the core stability provided by the LBPTT will result in a smaller difference between the step length with asymmetric leg lengths when compared to traditional treadmills.

Effect of Exercise Intensity on Speech, Psychological, and Physiological Measures

Sarah Fuller, Senior, Speech and Hearing Sciences

Eileen Gravani, School of Professional Studies

Erik Lind, Kinesiology

Kevin Dames, Kinesiology

The Talk Test is considered a non-invasive method to determine an appropriate and safe level of exercise intensity. The purpose of this study was to examine measures of speech production, psychological, and physiological responses across a range of exercise intensities. Fifteen participants completed three 15 minute bouts of cycling exercise at (a) a self-selected intensity and (b) intensities of 20% below and 20% above self-selected. Participants performed a maximal phonation test at pre-, minute 5, minute 10, and post-exercise and read a paragraph from The Rainbow Passage pre- and post-exercise. Affect and perceived activation were assessed pre-, minute 5, minute 10, end, and post-exercise. Heart rate, watts, perceived exertion, and attentional focus were recorded at minute 5, minute 10, and end. Preliminary inspection of descriptive statistics (mean/standard deviation) suggest exercise intensity levels resulted in differences in all measures across time points and conditions. Detailed results are forthcoming.

The Relationship between Physical Activity Patterns and Nutritional Knowledge

Jonathan Thomas, Senior, Kinesiology

Shannon Daly, Senior, Kinesiology

Deborah VanLangen, Kinesiology

Katherine Polasek, Kinesiology

Research consistently demonstrates that proper nutrition plays a vital role in maintaining body composition. More recently, nutrition has been touted to be more important than physical activity in weight loss. The purpose of this study was to determine if a relationship exists between nutritional knowledge and exercise behavior. Two hundred and fifty participants were asked to fill out a self-report exercise questionnaire as well as a nutritional knowledge quiz. Data was analyzed using descriptive statistics. Results are forthcoming.

Concussions in Sports

Ayana Flores, Junior, Sport Management

Drazen Zack, Senior, Sport Management

Jack Travers, Junior, Sport Management

Andrew Goldblatt, Sport Management

Mark Dodds, Sport Management

A concussion is defined as “traumatically induced transient disturbance of brain function and involves a complex pathophysiological process” that affects the employment and the nature of sports from the youth level to the professional leagues. About four million concussions occur in the United States per year in competitive sports. Concussions are responsible for severe brain injuries suffered in years after eligibility such as chronic traumatic encephalopathy, “irreversible progressive and fatal degenerative disease of brain tissue that is directly linked to repeated severe head trauma,” and is associated with symptoms including memory, depression, suicidal behavior, dementia, and death. Concussions are significant in the sports industry due to its damage in the player’s health that lead to litigation, regulations, and reform of governing bodies in terms of the safety of athletes that will influence a regulation of concussion management that push for change in the employment process of athletes.

Generating Fractal Images Using Iterated Function Systems

Matthew Metcalf, Senior, Mathematics/Physics

Isa Jubran, Mathematics

Iterated function systems (IFSs) are a method of generating fractal images to model objects from nature. This method will be briefly discussed and a collection of original fractal images generated using the software IFS Construction Kit will be presented.

The Implications of Popular Media’s Portrayal of Psychopathy for Mental Health Professionals Working in the Legal Arena

Matthew McLain, Senior, Psychology

Karen Davis, Psychology

The term psychopath is used in both popular media and legal proceedings, often without a clearly identified definition. How this term is used by mental health professionals testifying in court may differ greatly from how popular media portrays psychopaths. This paper will utilize examples from recent movies that depict psychopathy to illustrate how popular media portrays this construct in comparison to the clinical definition of psychopathy. This comparison is extremely valuable, as individual’s understandings of psychopathy may be inaccurate given the portrayal of psychopaths in popular media. Such portrayals may influence decisions that individuals make when serving as jurors, should the defendant be referred to as a psychopath. In addition to discussing the accuracy of the media’s portrayal of psychopathy, the potential implications of this portrayal for mental health professionals testifying about psychopathy will be explored.

A Controversial History: The Integration of Schools in Buffalo, NY

Claire Leggett, Junior, History/Art History

Gigi Peterson, History

The schools in Buffalo, New York followed a national trend of non-integration in the 1950s and 1960s. After a 1976 court ruling, Buffalo Public Schools began a four-phase integration plan that became a national model for desegregation, but it did not last. The integration plans in Buffalo were seen as highly effective during the 1970s and 1980s while the schools received court mandated funding. The four-phase plan allowed the schools and city residents to adapt to the new ideas of integration. The court mandate of integration was lifted in 1987 and Buffalo schools began to defund and dismantle the integration programs. Factors that had led to segregation in the 1950s and 1960s, including residential segregation and parental pushback against bussing led to a rapid re-segregation of the Buffalo Public School district. These problems are not uniquely Buffalo's, and can be used to analyze the national issue of school segregation.

84679: Finding the Voice amongst the Crowd, Interning with KHRCA

Gillian Farnan, Junior, History

Gigi Peterson, History

Gillian Farnan will present on her experience interning at the Kupferberg Holocaust Research Center, where she brought the voice of Ben Peres, number 84679 of Dachau concentration camp, to life through design, research and history.

The House at 4 Crawford Street: Espionage and Anti-Communist Panic in Senator Lusk's Hometown.

James Warner, Senior, History

Randi Storch, History

James Warner will present on the Lusk Committee's activities, which included an espionage operation among Ukrainian and Belorussian workers at the Wickwire factory.

***Bryophytes of Hoxie Gorge**

Adam Hocking, Senior, Biology

Timothy Baroni, Biological Sciences

SUNY Cortland's Hoxie Gorge field campus contains a highly diverse variety of organisms within its boundaries. These organisms range from the readily distinguishable Eastern Hemlocks of the old growth forests to the Golden rod of the old fields, however living amongst them is a much older group of specimens/organisms known as the Bryophytes (Mosses, Hornworts, Liverworts). Bryophytes are very small and often overlooked by the untrained eye. They can look very similar, and may require uses of a hand lens and a good field guide to identify genera and species. In order to further the understanding of the bryophyte biodiversity and abundance at Hoxie Gorge a field study was conducted. Approximately 150 collections were made, databased and curated in the SUNY Cortland's Herbarium (CORT). The information generated by this study has been developed into a website about Bryophytes for SUNY Cortland, consisting of images both macroscopically and microscopically.

***Examination of Biodegradable Jute Matting as a Management Option for the Invasive Aquatic Plant, Variable-Leaf Milfoil (*Myriophyllum heterophyllum*)**

Quintin Casella, Senior, Conservation Biology

Angela M. Pagano, Biological Sciences

The invasive aquatic plant, variable-leaf milfoil (*Myriophyllum heterophyllum*) has become a nuisance species in many of the bays of Raquette Lake in the Adirondacks, NY. Variable-leaf milfoil (VLM) forms dense mats which shade out native plants and cause changes in lake water and sediment chemistry, impacting lake health. A popular management technique is the use of benthic barriers, often a large tarp or plastic sheet that covers invasive aquatic plants, similar to how weed cloth is used in gardens. However, plastic barriers can be problematic as they can negatively affect sediment chemistry, trap animals, and pollute the lake if not properly removed. The purpose of this work was to examine the use of biodegradable jute fabric as an alternative barrier option for controlling the spread of VLM in Raquette Lake. As jute comes in different size weaves, we examined which weave of jute fabric would be most effective in preventing VLM growth.

***Emergency Contraceptive Dispensation in College Health Centers**

Caitlin Rasefske, Senior, Exercise Science

Jena Nicols Curtis, Health

Unprotected sex among college students is a public health issue that can result in an unplanned pregnancy. Emergency contraception (EC) is an effective way to prevent an unwanted pregnancy. The purpose of this study was to determine if there were patterns in EC dispensation across a convenience sample of colleges in New York State. Participating colleges were asked to provide electronic EC dispensation records for the past two academic years and answer a set of questions related to college policies on EC use. Results showed that colleges were most likely to dispense EC on Mondays, and there were no discernable trends throughout the semester as to when EC was dispensed the most. EC dispensation policies varied college to college. These findings can be used to improve health center policies and initiate targeted health interventions that can educate students about safe sex before the unprotected sex occurs.

***Run Economy of Trained Endurance Runners on the Lower Body Positive Pressure Treadmill**

Allison Schumann, Senior, Exercise Science

James Hokanson, Kinesiology

The use of Lower Body Positive Pressure (LBPP) treadmills has become an option for rehabilitation and training. Run Economy (RE) is important for endurance athletes to recognize their run efficiency. Fifteen endurance-trained runners participated in the study. They ran at steady state exercise at four body different weights (100, 85, 75, and 60%) and three run speeds (2.9m/s, 3.35 m/s and 3.9 m/s) on a LBPP or normal treadmill. Oxygen consumption and CO₂ production were collected using open flow indirect calorimetry and used to determine RE. There was a significant two-way interaction between treadmill speed and weighted condition on RE. Running at LBPP had a trend for a better RE yet at 60% body weight, the runner became less economical. Interestingly, absolute VO₂ was -10% less with LBPP for all speeds. Runners may be able to use a LBPP treadmill for training or rehabilitation at 15% less body without a change in RE.

* Denotes students who received 2016 Undergraduate Research Council Summer Research Fellowships.

POSTER SESSION B

4-4:30 p.m.

Taxonomy of New Bacterial Species, *Spirosoma*-like #209, from Cortland Tap Water

Ayomide Ola, Senior, Biomedical Sciences

Brittany Aragona, Senior, Biology

Christa Chatfield, Biological Sciences

The aim of this project is to place an unknown bacterial species, #209, into its correct taxonomic place and assign correct lineage. The unknown species is from Cortland tap-water biofilm and preliminary examinations showed low (93%) similarity to known species, below the lower cut-off window to be considered within the same species. It is highly likely that we are dealing with a novel species. Furthermore, a metabolic test called Biolog, which is a powerful identification tool, was carried out on the organism to obtain a phenotype profile of carbon sources. When results from this test were compared to its closest relative, there were significant differences. The test also revealed which antibiotics the organism is susceptible and resistant to. Endospore staining revealed what we hypothesize to be storage granules that disappear after prolonged incubation. Full genome sequencing data we hope will prove this isolate to be a new bacterial species.

A Study of the Relationship between the Proteins VTC3 and GME in the Arabidopsis Ascorbic Acid Biosynthetic Pathway

Melanie van Vliet, Senior, Biology

Patricia Conklin, Biological Sciences

Vitamin C, also known as ascorbic acid, is an essential nutrient for both plants and animals. Humans do not have the ability to synthesize ascorbic acid and must rely on other sources to obtain this vitamin. The main ascorbic acid biosynthetic pathway in plants has been determined, however there is still much to be discovered about the genes involved in this pathway. The GME enzyme is needed for ascorbic acid production in plants, and through previous research it was determined that another protein, VTC3, has direct interaction with GME and may regulate GME. By creating mutant plants overexpressing both VTC3 and GME, I will determine if an increase in both of these proteins leads to increased ascorbic acid. A coimmunoprecipitation will be done to confirm the interaction between GME and VTC3. I will also try to determine whether or not the presence of VTC3 stabilizes GME within the plant.

The Use of DivIVA to Confirm the Interaction between Two Arabidopsis Proteins (GME and VTC3) Involved in the Synthesis of Ascorbic Acid in Plants

Kayla Skinner, Junior, Biology

Patricia Conklin, Biological Sciences

While the biosynthetic pathway of ascorbic acid (AsA) in plants has been largely determined, the individual proteins that may have an effect on AsA production and regulation are unclear. GME is biosynthetic enzyme involved in AsA production. It is thought that the VTC3 protein, predicted to contain both a kinase and phosphatase domain, directly regulates GME. Prior yeast two hybrid studies have shown that VTC3 directly interacts with GME. This study is seeking to further solidify these findings through the use of the DivIVA protein, a cell division protein in *B. subtilis*. When fused to either protein of interest and green fluorescent protein (GFP), DivIVA will cause the interacting proteins (and GFP) to migrate to the poles of the cell causing localized fluorescence. This research will be using DivIVA and *E. coli* cells transformed with the VTC3 and GME genes to hopefully confirm the interaction between the two.

White-tailed Deer and Invasive Earthworms: How Do They Affect New York Ecosystems?

Gabriella Cerrati, Senior, Conservation Biology

Kaila Babcock, Senior, Biology

Andrea Davalos, Biological Sciences

Earthworm invasions have affected forest floor communities by shifting soil systems from slow-fungal systems to fast-bacterial systems. By impacting carbon, phosphorous, and nitrogen cycles, earthworms have the ability to affect the structure of the forest floor, both physically and geochemically. Earthworms can decrease plant biodiversity which has lasting effects on the ecosystem. To assess the impacts of increasing white-tail deer populations on earthworm biodiversity and abundance, we sampled earthworms at five different sites. Each site contained one open plot with deer access and one fenced plot. We used the mustard extraction method to assess earthworm populations. As the water-mustard mixture percolates the ground, earthworms surface due to skin irritations. We evaluated species richness and abundance of each earthworm that we collected. This experiment is significant in order to assess how increasing richness of earthworms affects forest floor communities and soil systems.

Predation Behavior of Invasive Species *Bipalium adventitium*

Emily Stronggreen, Senior, Biology

Carly Markowitz, Senior, Biology

Peter Ducey, Biological Sciences

Bipalium adventitium is an invasive terrestrial flatworm of North America that has been found across the continent in an array of various habitats. It has been studied that these flatworms use chemoreceptors on their head to follow the chemical trails of prey when hunting alone, but their social interactions during foraging have not been studied. Some planarians, like *Dugesia tigrina* and *Platydemus manokwari*, hunt and subdue prey in groups. We hypothesized that *B. adventitium* would be successful at group hunting and would choose to follow chemical trails of other individual *B. adventitium* to facilitate group attacks. Our experiment tested whether *B. adventitium* preferred substrates marked with mucus of another planarian of their own species over control substrates. The results will provide insight on the social behaviors and predation strategies of this species.

The Role of the Innate Immune System in Controlling JC Polyomavirus Infectivity, as Determined Using the CRISPR/Cas9 System

Corrine Edick, Senior, Biology

Elise Sedlacek, Senior, Biology

Christian Nelson, Biological Sciences

JC Polyomavirus (JCPyV) infects a majority of the human population, yet most healthy individuals remain asymptomatic. The main site of viral persistence is within cells of the kidneys and urinary tract. When a host becomes immunocompromised, for example with HIV/AIDS, increased viral replication is observed and JCPyV spreads to the central nervous system. Here, JCPyV infects glial cells resulting in extensive demyelination of nerve fibers. These irreversible effects can eventually cause a fatal disease known as progressive multifocal leukoencephalopathy (PML). In this study, the role of interferon α/β receptor in the innate immune response to infection of JCPyV is being investigated. This gene will be knocked out using CRISPR/Cas9 and its effect on viral infectivity will be determined in human glial cells and kidney cells. This work will allow further understanding of the innate immune response and potentially lead to treatment or prevention options in the future.

Characterization of the Effects of an Optimized Antiviral Compound on JC Polyomavirus Infectivity

Tashania Treasure, Junior, Biomedical Science

Christian Nelson, Biological Sciences

JC polyomavirus (JCPyV) is a common human pathogen responsible for the development of the neurodegenerative disease progressive multifocal leukoencephalopathy (PML) in immunosuppressed individuals. Although many of the cellular pathways that JCPyV uses to infect cells of the central nervous system remain unclear, JCPyV utilizes a pathway similar to toxins such as ricin and cholera. In this study, we are investigating the effectiveness of an optimized antiviral compound at preventing JCPyV infection. Cells will be treated with varying concentrations of antiviral compound, challenged with JCPyV and their infectivity determined. In addition, we are investigating how antiviral treatment disrupts the infectious pathway used by JCPyV. Using fluorescence microscopy, we will determine how the antiviral compound protects cells from infection by examining cellular localization of JCPyV following treatment. We expect to identify an effective antiviral compound that prevents JCPyV infection at low dosages and may be a suitable candidate for further drug development.

Construction of a Low-Cost Fluorescent Microscope for Use in Undergraduate Teaching Laboratories

Peter Voorhees, Senior, Biology/Exercise Science

Christian Nelson, Biological Sciences

Fluorescence microscopy provides real-time, high-contrast visualization of important biological processes and biochemical interactions with specificity not obtainable through other techniques. Due to these characteristics, fluorescence microscopy is a valuable teaching tool in the classroom. However, the prohibitive costs of fluorescence microscopes can make them difficult to obtain and impractical for classroom use. In order to reduce the cost of this technique and increase classroom access, open source design files will be used to 3D print components that enable standard Olympus CH2 compound microscopes to perform epifluorescence microscopy. Once this fluorescence microscope has been constructed, its ability to visualize a number of fluorescent cellular markers in a variety of cell types will be demonstrated. It is anticipated that construction of this microscope will demonstrate the feasibility of incorporating fluorescence microscopes into undergraduate laboratory exercises here at SUNY Cortland.

Kinetic Characterization of Two Variant Enzymes of *Campylobacter jejuni* Agmatine Deiminase

Ashley Jackson, Senior, Biochemistry

Anna Szostek, Senior, Biology

Katherine Hicks, Chemistry

Enzymes, which are composed of amino acids, are extremely important for the biological function of all living organisms. If we engineer a mutation in which one amino acid is swapped for another near or within the active site, this can provide insight into the chemical mechanism. In this work, a series of coupled assays were performed on H199Q and C315S variants of *Campylobacter jejuni* agmatine deiminase using a steady-state assay. Agmatine deiminase catalyzes the transformation of agmatine to *N*-carbamoyl putrescine. The kinetic constants obtained for the C315S variant are as follows: $K_M = 6.16 \times 10^{-1} \text{ mM}$, $k_{\text{cat}} = 2.88 \times 10^{-3} \text{ sec}^{-1}$, and $k_{\text{cat}}/K_M = 4.67 \times 10^{-3} \text{ mM}^{-1} \text{ s}^{-1}$. The k_{cat}/K_M for the wild type enzyme was determined to be $1.74 \times 10^{-1} \text{ mM}^{-1} \text{ s}^{-1}$, 35x larger than that of the variant. These data suggest that C315 is important for catalysis. Further experiments will include measuring the kinetic parameters for other variant enzymes, including the H199Q variant.

Analyzing the Volumetric Core-to-Rim Ratio of Chondrules with Fine-Grained Rims

Andrew Duval, Junior, Chemistry

Adam Vodicka, Senior, Biology

Melissa Morris, Physics

We investigate the size relationship between chondrule cores and their accretionary dust mantles. Meteoritic samples were mounted and polished, then examined with scanning electron microscopes (SEMs) in order to identify chondrules with fine-grained rims. Measurements were made of the core-to-rim ratio in this subset of chondrules in order to determine if a consistent relationship (e.g., 1:1) is observed.

Language as a Tool for Empowering Individuals with Disabilities

Fiona Hayden, Junior, Inclusive Special Education

Carrie Rood, Foundations and Social Advocacy

This poster will explore how the language used to refer to individuals with disabilities has evolved. Behind the many words and phrases lie conflicting ideas on what it means to have a disability. The social and medical models of disability will be presented and contrasted. The social model argues that society creates disability through systematic disadvantages such as inaccessible facilities, segregated schools, and stigma. The medical model argues that individuals with disability are inherently broken (Biklen 1992). This poster will explore the various ideologies that shape language, how language can support or threaten social justice, and the various stakeholders involved.

Wearing Multiple Hats: Master's Candidates' Action Research to Improve Teaching and Learning in the Professional Development School

Kelsey Bennett, Graduate, MST Childhood Education

Torrie VanDerzee, Graduate, MST Childhood Education

Alexis Crawford, Graduate, MST Childhood Education

Douglas LaFlamme, Graduate, MST Childhood Education

Julia T. Moore, Graduate, MST Childhood Education

Cora Moyer, Graduate, MST Childhood Education

Mai T. Nguyen-Vo, Graduate, MST Childhood Education

Jessie M. Nye, Graduate, MST Childhood Education

Kristen Marie Owens, Graduate, MST Childhood Education

Eric Pacicca, Graduate, MST Childhood Education

Parveen E. Paul, Graduate, MST Childhood Education

Emilie V. Sullivan, Graduate, MST Childhood Education

Inna Yanchuk, Graduate, MST Childhood Education

Cynthia J. Benton, Childhood/Early Childhood Education, MST Coordinator

Muteb Alquatani, Childhood/Early Childhood Education

Krystal Barber, Childhood/Early Childhood Education

Jeanne Galbraith, Childhood/Early Childhood Education

Beth Klein, Childhood/Early Childhood Education

Lin Lin, Childhood/Early Childhood Education

Joy Mosher, Childhood/Early Childhood Education

Charlotte Pass, Literacy

Shufang Shi Strause, Childhood/Early Childhood Education

Susan Stratton, Childhood/Early Childhood Education

Kimberly Wiczorek, Childhood/Early Childhood Education

Orvil White, Childhood/Early Childhood Education

Action research projects were conducted over the course of seven months in a Residency Program in the Homer School District Professional Development School. Projects were focused on instructional and curricular improvement in several ways: 1) Creating and implementing plans to adapt effectively the Common Core curriculum; 2) Identifying and proposing interventions for individual student learning or behavioral challenges; 3) Using assessment data to inform and shape appropriate planning for groups or individuals in the elementary classroom. Classroom instructional plans were proposed and assessment data used to analyze achievement in math, literacy, social studies and science, as well as directed toward improving the social curriculum. Presentations will document the research process used with elementary students, and will describe learning outcomes and implications for the student teachers and the benefits of research implemented in the Professional Development School.

CONCURRENT SESSIONS III

4:30-5:30 p.m.

Black Feminist Perspectives on Education, Media, and Black Lives Matter

Nicole Daniel, Senior, Communication Studies

Jacob Wright, Junior, Social Philosophy/Africana Studies

Stephanie Hector, Senior, Childhood/Early Childhood Education

Jocenelle Sarah Alcime, Senior, Inclusive Childhood Education

Mecke Nagel, Philosophy

Students present their papers on inequality and hidden forms of racism in education including in higher education. They will give a critical media literacy analysis on representation of Black women in the media as well as a response to the Black Arts Movement as feminist resistance. Their paper take up black feminist analysis in film as well as Hip Hop. Furthermore, they will investigate diverse aesthetic expressions in political and social movements such as the Movement for Black Lives.

Cortland Student Newspapers, 1879-2016

William McNeill, Junior, History

Brendan Woods, Junior, History

Daniel Bankert, Junior, History

Evan Faulkenbury, History

During the fall 2016 semester, students in HIS 280: Introduction to Public History created a digital public history exhibit on the history of Cortland student newspapers. Students researched newspapers in Memorial Library's newly opened archives, and working in groups of four, created five webpages dedicated to the history of Cortland's five student newspapers covering over 100 years. Students researched primary sources in an archive, learned about their own college's long history, and created a web exhibit that will continue to educate the public about Cortland's diverse student population. <http://webhost1.cortland.edu/cph/gown/cortland-student-newspapers-1869-2016/>

State of Officiating

Jason Blayda, Senior, Sport Management

Mark Dodds, Sport Management

Sport officiating has historically been a thankless yet indispensable job. Verbal assaults are part of the officiating landscape, but recent events have elevated the landscape to include battery and murder from not only the usual irate fan, parent, or coach but also children of high school age and younger. The presentation will highlight some of the challenges the modern official faces including their tax status, workers compensation classification, examples of the physical dangers, and what some organizations and states are doing to address this problem.

BeYOUtiful: Body Image in the Media

Jessie Espinet, Junior, Therapeutic Recreation

Marisa Lobelson, Senior, Therapeutic Recreation

Susan Barnett, Recreation, Parks and Leisure Studies

The purpose of the presentation is to describe BeYOUtiful, a one and a half hour leisure education program designed to inspire awareness, thought and action about positive and negative portrayals of body image in the media for female students in middle school, who have or are at risk for eating disorders. The presentation will demonstrate one activity for participants to experience a portion of the program. Participants will leave with a basic understanding of how a leisure education program can address societal issues, such as body image representation in media.

No Effect of Acute Beetroot Juice Supplementation on Moderate and Vigorous Intensity Aerobic Exercise

Nathaniel Ashton, Graduate, Exercise Science

Nicole Lindel '16, Exercise Science

Ryan Fiddler, Kinesiology

Nitric oxide (NO) plays a critical role in regulating blood flow to skeletal muscle. NO production in humans is 1) oxygen-dependent, 2) oxygen-independent. The latter can be augmented via beetroot juice supplementation (BR). The purpose of this study was to investigate the acute effect of BR during aerobic exercise. Ten female collegiate volleyball players completed three trials consisting of an initial graded test to exhaustion and two performance trials. For the performance trials, participants consumed 60 mL of BR or placebo (PL), three hours prior to five minutes of exercising at 45%, 65%, and 85% of their aerobic capacity. There were no statistically significant interactions between treatment and exercise intensity. There were no statistically significant differences in resting blood pressure between treatments. These results suggest that 60 mL of BR taken three hours before aerobic exercise has no effect on VO_2 , HR, RPE, or resting blood pressure.

Dominant and Non-Dominant Motor Competence, Physical Activity, and Physical Fitness among College Students

Patrick Brown, Senior, Exercise Science

Larissa True, Kinesiology

Participation in routine physical activity (PA) has well-established benefits. Health-related physical fitness (HRPF) and motor competence (MC) contribute to PA behaviors throughout childhood and adolescence. Research suggests that children who are less-competent movers will be less inclined to be physically active as adults. Although HRPF has been proposed as a mediator between PA and MC in youth, this hypothesis has not been confirmed in an adult population. The purpose of our study was to examine the PA/MC/HRPF relationship in a young-adult sample. Participants ($n = 46$) were asked to throw and kick with their dominant and non-dominant limb and jump as far as possible to measure MC. The one-mile run/walk test, the 2-minute sit-up test, and the 1-minute push-up test assessed HRPF. Participants wore an accelerometer for 3 weekdays and 1 weekend day to assess PA. Mediation analyses will be conducted to confirm the hypothesized PA/MC/HRPF relationship. Results are forthcoming.

Researching with the Modern Student

Breanna Soutar, Senior, Adolescent English Education

Emelda Bonilla, Junior, Adolescent English Education

Jenni Diaz, Senior, Adolescent English Education

Shelby Roberts, Senior, Adolescent English Education

Geoffrey Bender, English

"Diigo offers teachers and students a powerful set of cyber tools that allow students to handle source material in thoughtful and complex ways, organize a host of writing tasks, and collaborate meaningfully with one another in the construction of presentations and joint writing assignments." This was what we had the opportunity to teach other teachers and prospective teachers about in a conference held in March.

Mind Over Terror Anxiety Regulations Training Through a Biofeedback-Mediated Horror Game

Morgan Christie, Senior, Psychology/Professional Writing

Kevin Rutherford, English

Recent studies (Baranowski, et al. 2008; Ceranoglu 2010; Primack, et al. 2012) have shown that both biofeedback and video games can be useful in overcoming health-related issues in clinical settings. *Nevermind*, a biofeedback enhanced first person horror game, aims to teach players how to recognize and control their physiological responses to anxiety-provoking situations. In the current study, participants will be assigned to either the non-biofeedback (control) group or one of three biofeedback (experimental) groups and play *Nevermind* over a period of 6 weeks. The participants' perceived levels of anxiety will be evaluated throughout gameplay using the State Trait Anxiety Inventory (STAI). It is hypothesized that the participants in the biofeedback groups will experience a greater reduction in their perceived anxiety following gameplay than will the participants in the control group. Findings such as these would indicate that biofeedback enhanced video games may be useful in future treatment of those who suffer from anxiety.

*Analysis of *Legionella pneumophila* Attachment to Biofilms of Other Bacterial Species

Cassidy Sauer, Senior, Biology

Christa Chatfield, Biological Sciences

Legionella pneumophila (Lpn) are pathogenic bacteria that when inhaled, can elicit the well-known infection, Legionnaires' disease (LD). Lpn can inhabit water systems, and when droplets of infected water are inhaled from sources such as showerheads, dental tools, air conditioners, faucets, and hot tubs, LD infection is a result. My summer research was focused on studying the interactions of Lpn with two commonly found freshwater species, *Acidovorax* and *Pelomonas*. We've tested the interactions of multiple strains of both Lpn and *Acidovorax* to determine the most readily occurring attachment in multispecies biofilms. With this knowledge, we then studied the effects of adding different substances to the multispecies interacting biofilms including heparin, congo red, and thioflavin T to determine if attachment was inhibited. Understanding the method behind how these attachments occur is key in inhibiting Lpn attachment to pipe surfaces in water systems, ultimately reducing the amount of LD outbreaks.

*** Neuroprotective Effect of Stem Cells**

Joseph Hannett, Senior, Biomedical Sciences

Theresa Curtis, Biological Sciences

Arsenic exposure through contaminated food and water causes irreversible neural damage and affects millions of people worldwide. Several studies have demonstrated that stem cells can promote neural recovery after several forms of injury including stroke and neurodegenerative diseases. To determine if stem cells have a therapeutic potential in arsenic damaged neurons the following study was conducted. Human neurons were exposed to different concentrations of arsenic either in the presence or absence of medium that was conditioned by stem cells. After various exposure times, the extent of neuronal injury was accessed using a variety of methods. Our studies found that stem cell conditioned medium can protect the neurons from damage induced by arsenic. The role of stem cell conditioned medium in moderating neuronal responses to injury is unclear. We are currently conducting experiments to understand the mechanism of the stem cell's protective effects.

***Profiles of Psychological Resilience: Electroencephalography of Fixation, Emotional Challenge, and Recovery**

Stefania Buta, Senior, Psychology

Leslie Eaton, Psychology

In many research designs a neutral fixation point is used to direct participants' attention to the center of a computer screen. This data is often overlooked and only viewed as part of task instructions. The purpose of this investigation is to examine cortical responding to an invariant neutral fixation point. Continuous EEG measurements were taken throughout an 8-min alternating eyes open, eyes closed baseline and during a slide show presentation of positive, negative, and neutral images. The results of this exploratory study revealed that responses to the fixation point varied in accordance with responses to the preceding stimulus. The variance explained by a harmonic pattern of responses across photographs was associated with personality, providing clues about the nature of psychological resilience. It is hoped that these results inform future research designs that utilize invariant stimuli as part of the task instructions.

* Denotes students who received 2016 Undergraduate Research Council Summer Research Fellowships.