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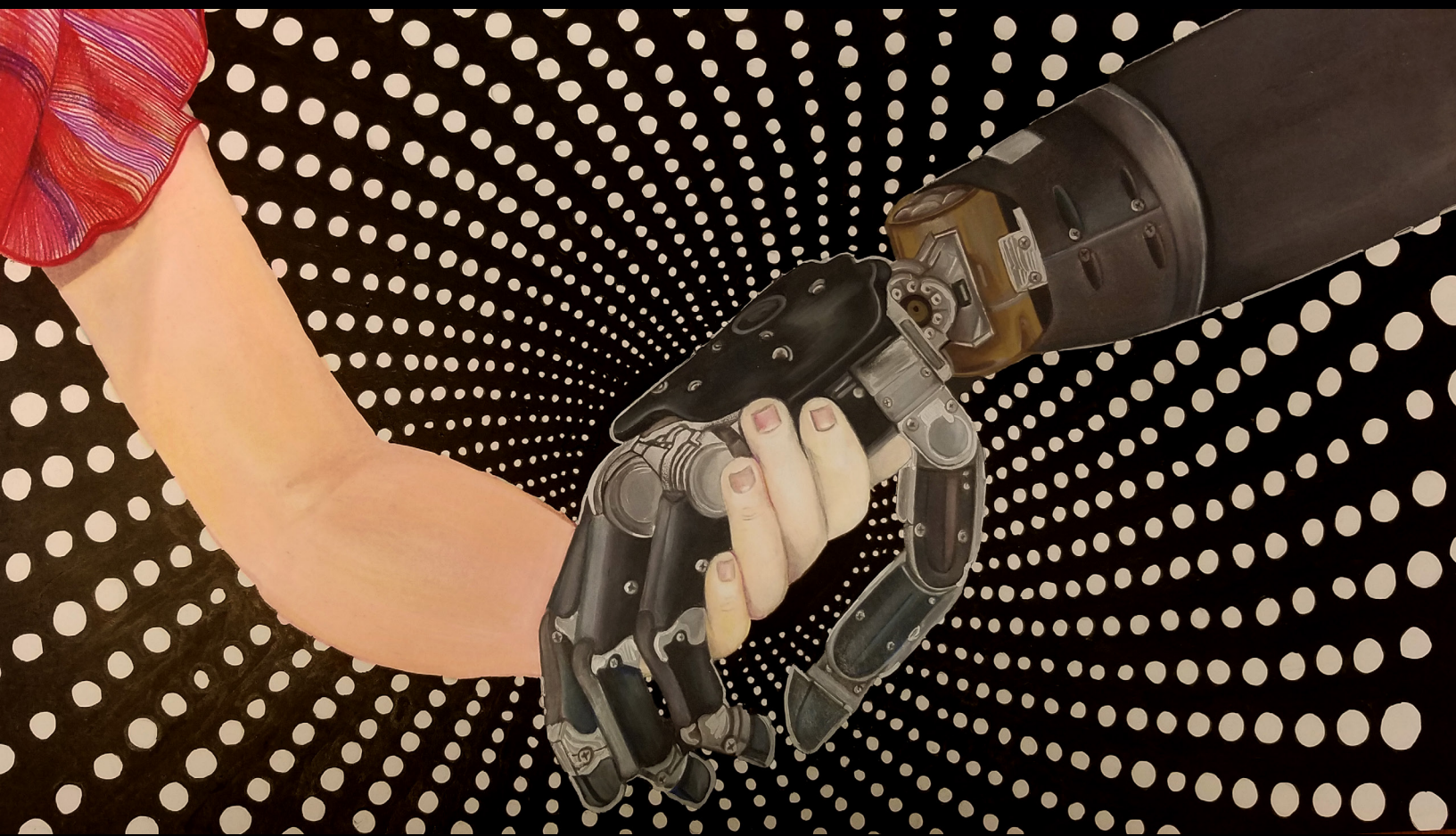
URSS Event Program Booklet 2017

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Artwork by Christine DeAndrea

9TH ANNUAL
**Undergraduate Research &
Scholarship Symposium**

Wednesday, April 5, 2017


Charles J. Dougherty Ballroom
Power Center, Duquesne University

Sponsored by Academic Affairs,
Office of the Provost and Office of Research





The 9th Annual
UNDERGRADUATE
Research
& Scholarship
Symposium



April 5, 2017

Charles J. Dougherty Ballroom
Duquesne University



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ACKNOWLEDGEMENTS

The organizers would like to thank all of the faculty mentors for their service and support of our undergraduate scholars.

A special thank you to the Bayer School of Natural and Environmental Sciences for their generous donation of the corkboards.

We would also like to thank the following organizations and individuals for their generous support of this important event:

Academic Affairs

Bayer School of Natural and Environmental Sciences

Center for African Studies

Center for the Catholic Faith and Culture

Center for Spiritan Studies

Center for Teaching Excellence

Committee of Student Jurors

Counselor Education Program

Enrollment Management Group

Gumberg Library

Honors College

History Department

Mary Pappert School of Music

McAnulty College and Graduate School of Liberal Arts

Mylan School of Pharmacy

Office of the Provost

Office of Multicultural Affairs

Phi Kappa Phi

Rangos School of Health Sciences

School of Nursing

University Academic Sustainability Committee

DU Undergraduate Christine DeAndrea for the cover design

Office of Research, Christine Pollock and Mary McConnell-Krepps

Honors College Student Jury: Ayan Ahmed, Naomi Anderson, Clare Banigan, Jenna Callan, Kaitlyn Caron, Kaitlyn Clem, Margo DeGenova, Anita Ghosh, Molly Graveno, Emily Grecco, Mariangela Gominho, Timothy Ireland, Jessica Kenny, Joshua Lamonde, Andrew Magyan, Julia Marn, Olivia Erikson, Jill Purcell, Trevor Root and Megan Wasson

April 5, 2017

Students, Faculty, and Guests:

Welcome you to the 9th Duquesne Undergraduate Research and Scholarship Symposium (URSS). This event celebrates our undergraduate scholars and their faculty advisors, highlighting the scholarship fundamental to a Duquesne education.

The URSS has grown over the last eight years into an event demonstrating the value of a liberal education and the breadth of topics explored by our undergraduate scholars. This year's event is one of the largest gathering of our undergraduate scholars to date.

I would like to thank all of our participating undergraduates for their hard work and the excellent posters and presentations they have developed. I especially want to thank our faculty who train and encourage young scholars and without whom this event would not be possible.

The URSS has depended on our sponsors who provide numerous awards in recognition for exceptional scholarship and on our judges who give their time to make this an outstanding experience for our students. Their continued support has been essential to the success of the symposium.

Finally I must thank the organizing committee and the Office of Research staff who devote their time to ensuring the success of this event.

Enjoy the day, celebrate your scholarship, and share the work of your fellow undergraduate students across the all of the disciplines that are part of Duquesne University.

Sincerely,



Alan W. Seadler Ph.D.

SCHEDULE

Tuesday, April 4, 2017 | Charles J. Dougherty Ballroom

9:30 a.m. to 2 p.m.	Student Participant Set-Up Participants are required to stop by, sign in and set up posters during this time.
2 to 4 p.m.	Welcome Reception for Participants, Judges, and Faculty (Shepperson Suite) Duquesne Faculty, student participants and URSS award sponsors/judges are invited to attend. Light appetizers will be served.
4 to 7 p.m.	Judges-Only “Sneak Peek” of Posters Judges are invited to view posters (without students present) at this time.

SCHEDULE



Wednesday, April 5, 2017 | Charles J. Dougherty Ballroom

8 to 8:30 a.m.	Student Participant Check in Continental Breakfast provided for participants.
8:30 to 9 a.m.	Open Poster Session and Judging Guests are invited to walk around, peruse student projects, and engage with students.
9 to 10 a.m.	Oral Presentation Sessions 1 Students participating in the poster sessions should attend the formal presentations. Poster Session is closed at this time. Please respect the formal presenters.
10 to 11 a.m.	Open Poster Session and Judging Guests are invited to walk around, peruse student projects and engage with students.
11 a.m. to Noon	Oral Presentation Sessions 2 Students participating in the poster sessions should attend the formal presentations. Poster Session is closed at this time. Please respect the formal presenters.
Noon to 1 p.m.	Open Poster Session and Judging Boxed lunches provided for participants and judges. We encourage you to eat your lunches while viewing posters.
1 to 2 p.m.	Oral Presentation Session 3 Students participating in the poster sessions should attend the formal presentations. Poster Session is closed at this time. Please respect the formal presenters.
2 to 3 p.m.	Open Poster Session and Judging Guests are invited to walk around, peruse student projects and engage with students.
3 p.m.	Awards and Closing Remarks

ORAL PRESENTATIONS: SESSION 1

9 a.m.

Christie McKernan

“Music Therapy and the Rehabilitation of Child Soldiers”

Music Therapy | Mary Pappert School of Music

Faculty Advisor: Robin Chapdelaine, Ph.D.

Abstract Number: 67

9:15 a.m.

Kallie Crawford

“Tracking the Sexual Assault Kit Backlog”

Forensic Science and Law | Bayer School of Natural and Environmental Sciences

Faculty Advisor: Lyndsie Ferrara

Abstract Number: 20

9:30 a.m.

Emily Leung

“Modification of an Implant Material”

Biochemistry | Bayer School of Natural and Environmental Sciences

Faculty Advisor: Ellen Gawalt, Ph.D.

Abstract Number: 54

9:45 a.m.

Jenna Pelly

“Lived Experiences of Hijab-wearing Muslim Women in the United States”

Psychology | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Lori Koelsch, Ph.D.

Abstract Number: 82

ORAL PRESENTATIONS: SESSION 2



- 11 a.m. **Michael McCombs**
“Risperidone for the Treatment of Psychosis for Patients with Alzheimer Disease: A Meta-Analysis of Randomized Controlled Trials”
Marketing | A.J. Palumbo School of Business Administration
Faculty Advisor: Frank D'Amico, Ph.D.
Abstract Number: 64
- 11:15 a.m. **Victoria Nesbitt**
“Novel ERK5/MEK5 inhibitors in the treatment of triple negative breast cancer”
Pharmacy | Mylan School of Pharmacy
Faculty Advisor: Jane Cavanaugh, Ph.D.
Abstract Number: 76
- 11:30 a.m. **Connor Evans**
“Computational Modeling of the Heat Equation with Material Applications”
Biomedical Engineering | Biomedical Engineering
Faculty Advisor: John Viator, Ph.D.
Abstract Number: 31
- 11:45 a.m. **Catherine Hull**
“Is “Help”, Helpful? Analyzing Foreign Aid in Context of Scale”
Information Systems Management and Accounting | A.J. Palumbo School of Business Administration
Faculty Advisor: Matt Ryan, Ph.D.
Abstract Number: 44

ORAL PRESENTATIONS: SESSION 3



- 1 p.m. **Kevin Chu**
“An Analysis of Psychological Manipulation in Military Culture”
Health Management Systems | Rangos School of Health Sciences
Faculty Advisor: Kathleen Roberts, Ph.D.
Abstract Number: 149
- 1:15 p.m. **Morgan Starczewski and James Daniel**
“The Effect of ADHD and Learning Disabilities on Neurocognitive Baseline Testing in High School Student-Athletes: A Critically Appraised Topic”
Athletic Training | Rangos School of Health Sciences
Faculty Advisor: Erica Beidler, Ph.D.
Abstract Number: 100
- 1:30 p.m. **Alvina Tran and Gregory Caspero**
“Knowledge and perceptions regarding human immunodeficiency virus and in-home testing among a regional sample of student pharmacists”
Pharmacy | Mylan School of Pharmacy
Faculty Advisor: Jordan Covvey, PharmD, Ph.D., BCPS
Abstract Number: 105
- 1:45 p.m. **Ashley Weiland**
“Synthesis and Characterization of $\text{Li}_2\text{CdSn}_3\text{S}_8$, a Quaternary Thiospinel”
Environmental Chemistry | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Jennifer Aitken, Ph.D.
Abstract Number: 112

SPECIAL AWARDS



Bayer School of Natural and Environmental Sciences

2 for Excellence in Research in the Basic Sciences: \$300

4 Honorable Mentions: \$100 each

Students participating in the Undergraduate Research & Scholarship Symposium whose project fall within the realm of the basic sciences will be considered for this award.

Center for the Catholic Faith and Culture and Center for Spiritan Studies

Catholic Faith and Culture and Spiritan Studies Award for Undergraduate Research: \$250

The aim of this award is to celebrate and encourage undergraduate research that engages resources in Catholic intellectual traditions in general or Spiritan sources more particularly.

Center for African Studies

Award for Undergraduate Research: \$250

This award is intended to encourage and reward undergraduate research in African Studies and related areas that engage Duquesne's ongoing commitment to Africa.

Center for Teaching Excellence

Award for Undergraduate Research: \$250

CTE is pleased to honor a project that focuses on the study of human learning in any of its many contexts, including but not limited to K-12 education, college, community, and clinical settings. Eligible projects will explore topics such as how and where learning happens or what empowers or hinders people in their learning.

Counselor Education Program

Award for Undergraduate Research: \$250

Preference for this award will be given to research topics related to the mental health, school, and marriage and family counseling fields, such as addiction, mental health diagnosis, advocacy, child development issues, trauma and crisis response, etc.

Department of History

The Clio Award for Undergraduate Research in History

First Place: \$200

Second Place: \$150

Third Place: \$100

Undergraduate History and Art History majors or minors who present their research at the URSS via poster or paper are eligible for this award.

Gumberg Library

Gumberg Library Award for Undergraduate Research: \$250

The Gumberg Library Award judges posters based on their intellectual merits and demonstration that the research presented meets the standard of its field.

Honors College

Outstanding Poster: \$250

Symposia posters are at their best when they optimally combine intellectual sophistication with legibility to the non-specialist. Therefore, criteria for this award include: scholarly rigor; visual appeal; organization; professional polish.

Mary Pappert School of Music

Mary Pappert School of Music Undergraduate Award: \$250

The Mary Pappert School of Music Undergraduate Award is open to all music students who participate in the URSS.

McAnulty College and Graduate School of Liberal Arts

Outstanding Research Merit: \$250

The McAnulty College and Graduate School of Liberal Arts Outstanding Merit Award is open to undergraduate participants in the liberal arts. A committee of Liberal Arts faculty and administrators will evaluate the posters' intellectual merits and demonstration that the research presented meets the standard of its field.

Mylan School of Pharmacy

Award for Undergraduate Research: \$250

The Mylan School of Pharmacy Award for Undergraduate Research serves to recognize projects in the field of pharmacy which demonstrate a high level of scholarly merit.

Office of the Provost

Provost Award for Outstanding Research: \$250

Office of Research Award for Outstanding Research: \$125

Provost Award for Best Presentation: \$125

This award serves to recognize outstanding scholarship within the university across all of the fields of study. The awards will be given to a student demonstrating exceptional scholarship through either poster or oral presentation

Office of Diversity and Inclusion

Outstanding Undergraduate Research: \$250

The Office of Diversity and Inclusion is pleased to sponsor an award for outstanding, undergraduate research. The aim of this award is to recognize and celebrate research that contributes to creating, and maintaining an inclusive campus community here at Duquesne University and in the Greater Pittsburgh area.

Phi Kappa Phi, National Honors Society

Outstanding Research: \$500

3 for Honorable Mention: \$250

Posters from all disciplines accepted to the URSS will be considered for the Phi Kappa Phi Awards.

Rangos School of Health Sciences

2 for Rangos School of Health Sciences Award for Undergraduate Research: \$250

Students of the Health Sciences who are participating in the URSS will be eligible for these awards.

School of Nursing

School of Nursing Undergraduate Research Award: \$250

The School of Nursing Undergraduate Award is available to students participating in the URSS whose research is applicable to the healthcare and/or nursing field. Projects will be evaluated based upon the use of existing research for support, understanding and application of principles of research, effective communication, etc.

University Academic Sustainability Committee

Excellence in Sustainability & the Environment: \$250

Projects demonstrating excellence with a focus on sustainability and the environment will be considered for this award.

ABSTRACTS

*Denotes oral presenter

1 *Modification of the Surface of Stainless Steel*

Emily Allego, Nina A. Reger, Ashley Blystone, Ellen S. Gawalt

Sophomore | Biochemistry | Bayer School of Natural and Environmental Sciences

Faculty Advisor: Ellen Gawalt, Ph.D.

ABSTRACT:

Stainless steel is used in various medical implants and the most common type is SS316L. Although SS316L is corrosion resistant in the body, the surface supports the formation of biofilms. A biofilm is when a group of bacterial cells are able to attach to each other and then adhere to the metal surface. The bacterial cells then cause infections at the implant site and can cause the body to reject the implant. To prevent the formation of biofilms, the metal implants have to be coated through the use of a self-assembled monolayer (SAM). Elaidic acid was used for the formation of the SAM. Elaidic acid has a carboxylic acid head group for binding to the surface and a double bond for polymerization to protect the surface. Aerosol deposition was performed in order to coat SS316L with Elaidic acid. Diffuse reflectance infrared Fourier transform spectroscopy was used to confirm the presence of the SAM on the metal.

2 *Unity is Strength: Effective Global Partnerships*

Clara Altemus, Nikki Yeckel, Quinn Tattersall, Anne Marie Hansen

Senior | Occupational Therapy | Rangos School of Health Sciences

Faculty Advisor: Jaime Munoz, Ph.D.

ABSTRACT:

The purpose of this study is to uncover the perspectives of African occupational therapists (OTs) on how they perceive and experience effective global partnerships as host to western collaborators, as well as understand their position on effective strategies to develop sustainable partnerships. The World Federation of Occupational Therapists (WFOT) and the American Occupational Therapy Association (AOTA) have made a commitment to promote a globally connected profession that responds to the needs of our diverse societies (World Federation of Occupational Therapists, 2011; AOTA, 2007). However, few studies have specifically examined the perspectives of host collaborators who receive OT scholars and practitioners into their resource-scarce contexts. This qualitative research design combines survey research methodology with qualitative focus group strategies as the best approach for eliciting and analyzing African OTs perspectives of hosting global partnerships (Given, 2008). Snowball recruitment strategies generated a representative sample of OTs practicing in various African countries. Qualitative data analysis began with line-by-line microanalysis of data. Preliminary data showed that of the seven therapists surveyed, five have taken part in a global partnership. All partnerships were

focused on education and professional development. The majority of the respondents (60%) felt their host organization “had full control for setting priorities,” while 20% felt they “had little control for setting priorities.” Preliminary data defines the three largest challenges to effective partnerships as financial stability, long-term stability, and collecting resources. Further data collected from this research study will be used to better understand sustainable occupational therapy global partnerships for all those involved.

3 Mossbauer Spectroscopy

Mark Allwes, Monica Sorescu

Senior | Physics | Bayer School of Natural and Environmental Sciences

Faculty Advisor: Monica Sorescu, Ph.D.

ABSTRACT:

Scandium oxide-doped hematite, $x\text{Sc}_2\text{O}_3 \cdot (1-x)\alpha\text{-Fe}_2\text{O}_3$ with molar concentration $x=0.1, 0.3,$ and 0.5 was prepared by using ball milling, taking samples at times 0, 2, 4, 8, and 12 hours. The resulting Mossbauer spectra of the nanoparticles systems were parameterized using NORMOS-90. For each concentration, the spectra at 0 hours only consisted of 1 sextet, as the substitution of Sc_2O_3 into Fe_2O_3 did not appear until after 2 hours of ball milling time (BMT). Concentration $x=0.1$ at BMT 2 hours consisted of 2 sextets while $x=0.3$ and 0.5 were fit with 1 sextet and 1 quadrupole-split doublet. Concentration $x=0.1$ at BMT 4 and 8 hours consisted of 3 sextets, and at BMT 12 hours consisted of 4 sextets. For concentrations $x=0.3$ and 0.5 at BMT 4, 8, and 12 hours the spectra were fit with 3 sextets and 1 quadrupole-split doublet. With increasing initial concentration, the appearance of the quadrupole-split doublet became more pronounced, indicating the substitution of Fe into Sc_2O_3 occurred. But for $x=0.1$, the BMT did influence the number of sextets needed, causing an increase in substitution of Sc_2O_3 into Fe_2O_3 .

4 How does Iconicity Relate to Perceived Beauty and Functionality in Everyday Objects?

Mary Appleby, Joaquin Gonsalves

Senior | Psychology | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Alexander Kranjec, Ph.D.

ABSTRACT:

The present study examines how different kinds of aesthetic judgments can be made about everyday objects. Specifically, we are interested in the extent to which judgments of beauty, functionality, and iconicity may dissociate and/or correlate within the same object. In Experiment 1, participants will rate approximately 300 chairs from a prior study on three Likert scales measuring beauty (visual appeal), functionality (how well an object serves its intended purpose), and iconicity (the degree to which an object is recognizable, familiar, or well-known). In Experiment 2, participants will use the same four-point scales to rate 30 examples of six new categories of common objects (pencils, coffee cups, pens, bottles, tables, and sunglasses). A better understanding of how beauty, iconicity, and functionality relate can provide further insight into the particular qualities that make people prefer some objects more than others.

5 Synthesis of Small Functionalized Molecules Using Copper-Catalyzed Atom Transfer Radical Addition (ATRA)

Michael Baldwin

Junior | Chemistry | Bayer School of Natural and Environmental Sciences

Faculty Advisor: Tomislav Pintauer, Ph.D.

ABSTRACT:

Copper-catalyzed atom transfer radical addition (ATRA) has shown to be an effective method for the synthesis of small functionalized molecules. The bifunctional alkyl halide initiator 1,2-bis(bromoisobutyryloxy)ethane (BBIbE) was used for the ATRA of various acrylates [methyl, propargyl, ethylene glycol methyl ether] and acrylonitrile. Initially mediated by UV light, the reactions were performed under N₂ at ambient temperature in methanol (MeOH) and catalyzed by [CuI(Me₆TREN)Br][Br] or [CuI(TPMA)Br][Br] (Me₆TREN = Tris[2-(dimethylamino)ethyl]amine; TPMA = Tris(2-pyridylmethyl)amine). To optimize the synthesis of diadducts, catalyst studies have been performed to determine the ideal loading to provide desirable conversions and yields. Two variations of ATRA reactions were performed to identify a more facile path for future use, providing comparably low yields with methyl acrylate (32% vs 39%). This methodology can eventually be extended to other multifunctional initiators.

6 What is the best practice to treat necrotizing fasciitis?

Clare Banigan, Devyn Brewster, Kaitlyn Gallant, Rachel Hobi

Senior | Nursing | School of Nursing

Faculty Advisor: Manjulata Evatt, RN, BSN, MSN, DNP

ABSTRACT:

Necrotizing fasciitis (NF) is an uncommon disease that is identified by a soft tissue infection with extensive necrosis of fascia and subcutaneous tissue. This disease can progress rapidly and can cause loss of tissue function. Therefore, immediate treatment is necessary to prevent widespread, systemic infection and permanent tissue damage. Many treatment methodologies have been presented throughout the literature, but there is no definitive gold standard treatment. Due to the lack of clarity in which method is best, it is necessary to explore treatments that provide the best outcome for the patient with NF. To address the issue of a lack of definitive treatments, we undertook a literature review of current treatment methodologies, to see if there was one treatment that provided better outcomes than any other. Twenty-five articles were initially selected and narrowed down to ten. The literature reveals that the best outcomes occur with fast identification and treatment to prevent further damage to the affected and surrounding tissue. Prompt surgical debridement of the wound is also a key in promoting optimal outcomes. After surgical debridement of the wound, use of continuous negative pressure therapy is a treatment option that results in ideal outcomes for patients with necrotizing fasciitis. A notable pharmacologic finding is that, the use of antibiotics, especially vancomycin used in conjunction with another broad-spectrum antibiotic, in addition to other therapies is beneficial for systemic treatment. Healthcare professionals can use these findings to address the lack of a gold-

standard treatment, when working on future research projects, to continue to identify the treatments with the best outcomes for patients.

7 Approaching Neuroscience Using an Engineering View

Marissa Behun, Benedict J. Kolber

Junior | Biomedical Engineering | Biomedical Engineering

Faculty Advisor: Mary Jo Babinsack

ABSTRACT:

Single-unit recordings use the electrical and computer coding knowledge of engineering to better understand various biological phenomena. The basis of single-unit electrophysiology lies in using a microelectrode to detect a signal using an AC-coupled amplifier to record the electrical responses from the area of interest. It is important to understand the engineering components of this model due to the variability in signals detected. This project investigates a common, poorly treated chronic pain disorder, interstitial cystitis (IC)/bladder pain syndrome. Many of the symptoms of IC suggest a central nervous system component. However, the role for the brain in processing and modulating bladder pain is largely unknown. Without understanding how the brain reacts to the painful stimuli, it is difficult to treat IC patients. To investigate the hypothesis that dynamic changes in the brain account for symptoms of IC, in-vivo recordings of the left and right central amygdala using carbon-fiber electrodes were done during painful bladder distention in *Mus musculus*. Once a neuron was detected during the recording process, urinary bladder distensions were used to observe how the neuron responded to a noxious stimulus. This abstract will describe the electrical circuitry of this setup, results filtering out environmental noise, and preliminary results showing neuronal responses.

8 A Look Inside the Proton

Morgen Benninghoff

Sophomore | Physics | Bayer School of Natural and Environmental Sciences

Faculty Advisor: Fatiha Benmokhtar, Ph.D.

ABSTRACT:

The naive picture of the proton is that it is formed by 3 very small particles called quarks and these quarks are held together by strong force carriers called "gluons". All matter is formed by quarks and gluons. One puzzle in this field is that when the mass, the momentum, the spin, and the electromagnetic properties of these quarks are summed together, the result is not equal to the known properties of the proton. Theoretical investigations and corresponding experiments all around the world have been trying to solve this mystery. I have begun working on the experimental side and I am discussing the theory that a sea of virtual pairs of quarks appearing and disappearing in a fraction of a second may contribute to the properties of the proton that we are missing. The third lightest quark, which is called the strange quark, is what the most interest is placed on. I will be presenting the method that will allow us to measure its contribution to the proton. Future work involves my Summer Undergraduate Laboratory Internship at the Thomas Jefferson National Accelerator Facility where I will be able to participate in the data taking for these experiments and data analysis.

9 Juxtaposing Jackson: How President Trump Compares to His Predecessor

Brendan Bertig

Senior | Political Science | McNulty College and Graduate School of Liberal Arts

Faculty Advisor: John Hanley, Ph.D.

ABSTRACT:

Donald Trump's election to the presidency is, for individuals like Stephen Bannon and Rudy Giuliani, appreciably analogous to Andrew Jackson's unprecedented victory in 1828. Indeed, both men are perceived as populist candidates who utilized a brash personality, the ascendancy of fame, and an anti-establishment message to vanquish their political opponents, all the while relying heavily on public support as a mandate to brandish expansive executive power. In proudly hanging his predecessor's portrait above the Oval Office desk, however, President Trump emblematically lays claim to such similarities without recognizing that they are largely overdrawn. For every conventional comparison asserted, there is an equally compelling dissimilarity that, when couched within constantly evolving historical and political continua, serves to counteract said associations.

Although mainstream comparisons have not been particularly convincing, Trump and Jackson are similar to the extent that they were elected during eras signifying what political scientist Stephen Skowronek refers to as "politics of reconstruction" – namely, eras in which a general disillusionment towards the previous regime's commitments and interests produces support for an execution of governmental powers on new terms. In this context, the transitions from John Quincy Adams to Jackson and Barack Obama to Trump bear striking resemblances – resemblances that, once adduced alongside the political structures of presidential authority, bring a more nuanced comparison of Trump and Jackson into sharp relief. By illustrating the comparison in this fashion, one is able to speculate about Trump's policy proposals, the support or opposition that they merit, and accordingly, the path of our nation.

10 Investigating Induced Tolerance in Amphipods

Kimberly Bischof, Sara McClelland

Sophomore | Environmental Science | Bayer School of Natural and Environmental Sciences

Faculty Advisor: Sarah Woodley, Ph.D.

ABSTRACT:

Pesticides inevitably effect non-target species. Other studies have shown that pre exposure to a sub-lethal level of a toxin can induce increased a subject's survival when exposed to higher levels of toxin. In this study, we examine the effects of chlorpyrifos (CPF) on non-target species, amphipods. Via a Lethal Concentration 50 (LC50) pilot test we found that amphipods have an LC50 for CPF around 7.2 ppb. We used the results of the LC50 to estimate an LC95 and LC5. Amphipods were exposed to a low level of CPF, rinsed in fresh water for one hour, and then exposed to varying levels of CPF. We found that pre exposure to a low dose of CPF does not induce a higher survival rate to higher exposures of CPF in juvenile amphipods. It is still unknown is lengthening the time between exposures or the second exposure would produce evidence that amphipods could develop tolerance.

11 Language Intervention Strategies and Availability of Services for Adults with Autism Spectrum Disorder

Rebecca Bulgarelli, Katie Belardi

Sophomore | Speech-Language Pathology | Rangos School of Health Sciences

Faculty Advisor: Lori Marra, M.A., CCC-SLP

ABSTRACT:

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder caused by a mutation during embryonic development that leads to deficits in cognition, behavior, and communication. It affects approximately 1.5 million individuals in the United States, each with their own unique set of deficits. Adults with ASD, however, typically do not receive treatment for these deficits after graduating high-school. The goal of this literature review is to explore the needs of adults with ASD and to analyze intervention studies to determine how to best address these needs. Effective interventions include vocational training, pragmatic language treatment, and relational skills practice. It is critical to involve and educate the adults' caregivers throughout these interventions in order to further enhance adults' with ASD growth. In addition to exploring current intervention strategies, research regarding local Pittsburgh services for adults with ASD was conducted. These services ranged from social groups, vocational training, and independent living programs. A survey was also constructed with the goal of determining potential services parents of adults with ASD, speech-language pathologists, and other professionals would like to see be created in the future. When this survey is analyzed, the hope is that the results will provide insight for clinicians to better address the unique needs for individuals with ASD.

12 World War of Media

Mary Katherine Byrne

Junior | Secondary Social Studies Education/ History (Dual Degree) | School of Education

Faculty Advisor: Jotham Parsons, Ph.D.

ABSTRACT:

The world of mass media has changed immensely over the past century. The way Americans live their daily lives has shifted due to quicker information and knowledge about international, national and local affairs, due in part to mass media. This shift, while taking place over the period of many years, was sparked during World War II. Prior to the War, many Americans struggled to stay informed about what was taking place outside of the United States due to lack of technology and resources. Following the 1939 World of Tomorrow Fair in Flushing, New York, the use of mass media became more accessible to the everyday citizen, whether this is through radio, newspaper, film reels and magazines. The World of Tomorrow introduced visitors to the ideal American life, which included having a well-informed picturesque family and using mass media in everyday life. This new-found accessibility led to heightened nationalism along with knowledge about what was taking place beyond the United States' borders. Americans began to learn about world news before seeing their favorite movie, listened to daily updates on the radio and saw propaganda to bolster the war effort. This shift in mass media to reach citizens across the country has made a lasting impact that continues to change today.

13 Evaluation of a mini-barcode primer set for use in monitoring ray-finned fish communities from environmental DNA samples.

Ashton Callipare, Taylor Cutteridge, Brian Trevelline and Brady Porter
Sophomore | Biology | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Brady Porter, Ph.D.

ABSTRACT:

The state-adopted method of electrified benthic trawling for the standard survey of fish communities on large river systems (Allegheny, Monongahela, and Ohio) has been labor intensive, expensive, and imposed dangers for both organisms and surveyors. Advancements in Environmental DNA and mini-barcode technology with next-generation sequencing have potential to provide improved detection of aquatic organisms from water samples. A previously designed mini-barcode primer set, which amplified a partial mitochondrial Cytochrome Oxidase (COI) gene, was evaluated for its ability to detect and identify a wide range of ray-finned fishes from the three rivers region. COI sequences from GenBank were aligned to test primer selectivity. After PCR optimization, primers were tested on DNA from tissue samples and amplicon identity was verified through capillary sequencing and BLAST analysis. Candidate primers amplify most, but not all ray-finned fishes. Potential exclusions include the lake sturgeon, paddlefish, and northern pike. In addition, candidate primers could amplify non-target taxa that may have high eDNA concentrations in the three rivers region like Asiatic clam, crayfish, waterfowl and humans. Current work is focused on developing a new universal primer set exclusively for ray-finned fishes.

14 Racism in Trump's America

Nupur Charyalu
Senior | Psychology | McNulty College and Graduate School of Liberal Arts
Faculty Advisor: Amanda Lowe, Ph.D.

ABSTRACT:

Donald Trump's campaign and presidency have resulted in a documented spike in hate rhetoric and bias-motivated incidents, evident by the 1000-1100 identified occurrences of discrimination and harassment since the 2016 election. Richard Cohen, Southern Poverty Law Center's president, blames Trump and his divisive language for this surge in hate crimes. Demonstrated by his rhetoric and policy proposals, as well as the behavior of his supporters during the 2016 campaign and presidency, it is clear that Trump relied on white racism and nativism to win the White House. My paper aims to explore the cause for this spike in hate crimes. Why is there a surge in hate crimes and how did we as a country reach this point in our journey? I intend to answer this question by employing a variety of approaches, ranging from social psychology to the psychology of totalitarianism. Trump's social influence is remarkable and seems to be the most appealing to individuals who are high on the authoritarianism scale. Social science research indicates a current demographic shift sweeping through the country that might also illuminate this sudden spark in hate crimes. Although one exact answer does not exist for the issue at hand, I believe the spike in hate crimes since Trump's campaign and election can be understood by authoritarianism, the power and influence of Trump's rhetoric, and the demographic shift of the

country. In composing this paper, I aspire to make sense of a heated political environment that is reminiscent of 1930s Germany.

15 *The Cruel World of Beauty: Cosmetic Testing on Animals*

Alexis Cook

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Faculty Advisor: Courtney Druzak

ABSTRACT:

When it is early in the morning, we are normally in a scuffle trying to get ready for work. Some of us grab the tube of mascara and hurriedly run it through our lashes. We reach for the lipstick and messily apply a thick coat of it around our lips. We consumers are not thinking about how their makeup was created. The makeup store does not sell any unsafe products, so why should we give second thought to our products? Though no one is usually thinking about it, the harsh reality always lurks behind our actions. Little do many know, 100,000 to 200,000 animals are being tested on each year to produce many brand's products. These animals are abused, tortured, and killed with little regard to their wellbeing. Brands are constantly redesigning formulas and chemicals; as a result, chemical testing is not conducted just once, but must be repeated thousands of times. This presentation explores the unnecessary and the unethical torture done to animals in order to produce cosmetics in the name of the beauty industry. With the new technological advances such as computer models and artificial blood cells, there is no necessity to continue this animal abuse. The purpose of this project is to reveal the cruel world of beauty and offer potential solutions to end cosmetic testing on animals.

16 *Better Babies and "Race Suicide": Eugenics in Pittsburgh Women's Groups*

Nicole Cordier

Senior | History and Classics | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Andrew Simpson, Ph.D.

ABSTRACT:

The pseudoscientific theory of eugenics, which advocated selective breeding in humans to create a better race, was exceedingly popular in America, particularly during the early decades of the twentieth century. Eugenic theory shaped both policy and interpersonal relationships; voluntary organizations acted as a bridge from individuals to government. These organizations pushed for eugenic laws in many cases. Popularity does not necessarily indicate universal agreement, and in many ways, eugenics was hotly contested. This project examines the way that individuals interacted with the theory of eugenics, to try to determine how the subject influenced their daily lives. Women's reform groups, such as the Birth Control League and the Catholic Women's League were at a cross section between the public and the home. Here, it is also possible to see how their beliefs translated to actions, because many of these groups interacted with people that eugenic ideology considered "defective." Because this theory was so heavily supported by white, upper- and middle-class men and women, they saw immigrants, African Americans, the disabled, and the working class as "threats to the race." Pittsburgh's diversity and long

history of reform make it the perfect case study. This project examines the ways that women's groups in Pittsburgh acted for or against eugenics, revealing that eugenics played a significant role in their activism.

17 A Comparative Study of Two Analgesic Compounds, Fenobam Sulfate and Fenobam Free Base, Using a Model of Inflammatory Nociception

Abigail Cox, Neil Lax, William Welsh, Youyi Peng, Benedict Kolber
Junior | Biology | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Benedict Kolber, Ph.D.

ABSTRACT:

Cox, Abigail^{1,2}, Lax, Neil^{1,2}, Welsh, William^{3,4}, Peng, Youyi³, Kolber, Benedict^{1,2}
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Duquesne University, Pittsburgh, PA
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A diverse array of chronic pain conditions exist, each with multiple hypothesized receptor targets for treatment. One potential target for analgesia (i.e. pain relief) is the metabotropic glutamate receptor subtype 5 (mGluR5). A selective antagonist of mGluR5, fenobam free base, provides analgesia in preclinical models. Fenobam free base, however, has poor solubility and a short half-life, limiting its efficacy. A new salt formulation of the compound, fenobam sulfate, has improved solubility and a longer half-life, which may contribute to extended analgesic effects. A comparative study of both fenobam formulations was performed in male and female mice using an inflammatory pain model in which an inflammatory agent, formalin, was injected into the hind paw. The main objective was to determine if fenobam sulfate has analgesic properties similar to those of fenobam free base. The two compounds were each dissolved in two separate vehicles, DMSO and BCD. Fenobam sulfate produced analgesic effects similar to those of free base when dissolved in either vehicle. Both compounds dissolved in DMSO, however, produced greater analgesic effects compared to BCD. The duration of time in which fenobam sulfate had an effect was also characterized through mechanical tests two and three hours following formalin injection. Fenobam sulfate in BCD induced prolonged analgesia in females, but not in males. The impacts of fenobam sulfate and free base on locomotion were also investigated, and both compounds induced similar increases in locomotive activity. Overall, these results suggest that fenobam sulfate may be a more effective analgesic than fenobam free base.

18 Policy Recommendation Addressing the School-to-Prison Pipeline

Don Crawford
Senior | Political Science | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Lewis Irwin, Ph.D.

ABSTRACT:

The conventional wisdom of the American education system has been to earn a high school diploma and pursue post-secondary education. For many students this conventional wisdom holds true however for a

large group of students, post-secondary education does not appear to be the next step. A system of policies and practices in public schools across the nation unfairly places students of color at a disadvantage and does more to lead them into the criminal justice system than to post-secondary education. This phenomenon that is facing many public schools across the nation is commonly referred to as the “school-to-prison pipeline.” In an attempt to address the issue and potentially solve the problem, this policy recommendation suggests that public school districts abandon their status quo policies on discipline and pursue a new course of action which is proposed in this document.

To reduce the unfair number of out-of-school suspensions and expulsions among children of color, public school districts should begin by developing new district-wide policies on discipline. The parameters and requirements of the new policies will be discussed in detail during the later portion of this recommendation. In attempting to address the socio-economic problems that contribute to the behavioral issues of minority children, school districts should create and adopt a five-year strategic plan to make their school’s become more community-based during out-of-school time.

19 Parental Expectations for Educational Attainment of Daughters Currently Attending an Inner-City Secondary School

Lukas Damian

Junior | Nursing | School of Nursing

Faculty Advisors: Cathleen J. Appelt, PhD; Jessica Devido, PhD; and Andrew T. Simpson, PhD

ABSTRACT:

Approximately three quarters of students enrolled in Pittsburgh Public Schools will complete the requirements for high school graduation, but at the highest risk of not graduating are students enrolled in inner city schools. As part of an interdisciplinary study conducted by students and faculty from Duquesne University, 21 parents of middle school and high school students from inner-city schools were surveyed to gain a better understanding of their career aspirations for their daughters. Parents also completed a second, separate survey that assessed race, marital status, residential area, level of education, and household income. Out of the 21 parents surveyed, only five (24%) achieved a Bachelor’s Degree. None hold any higher degrees. Ninety percent (90%) of participants have a gross household income of less than \$50,000 and 85% of participants classify themselves as “Black or African American”. With regard to parents’ educational aspirations for their daughters, all but four (80%) believe that their daughters should attain at least an Associate’s Degree. Seven believe that their daughters should attain a Doctoral Degree. Based on inner-city graduation rates this level of expectation is quite high, and may suggest a need for more support to aid parents and their daughters in realizing educational goals.

****20 Tracking the Sexual Assault Kit Backlog***

Kallie Crawford, Lyndsie Ferrara

Senior | Forensic Science & Law | Bayer School of Natural and Environmental Sciences

Faculty Advisor: Lyndsie Ferrara

ABSTRACT:

The backlog of untested sexual assault kits is a national problem. Numerous federal funding

opportunities offer the forensic science and law enforcement communities valuable resources needed to test the kits, but issues still remain. The majority of resources are focused on the collection and testing of sexual assault kits, but the tracking of the kits has not been a primary focus. This research highlights improvements that can be made to better understand the current backlog and improve the future processing and tracking of kits. Given the lack of a universal evidence tracking database among agencies, tracking sexual assault kits seems impossible. In Allegheny County, over 100 different law enforcement agencies exist, each with their own policies and procedures. As a result, the number of untested kits is unknown. Through a comprehensive review of improved practices in proactive jurisdictions, including Ohio, Houston, and Detroit, valuable data was gathered about improved tracking mechanisms. Additionally, interviews with key stakeholders identified issues in Pennsylvania. This information led to the development of a survey that will aid in data collection related to sexual assault tracking practices across the country. A multidisciplinary, collaborative approach is needed to better understand the true sexual assault kit backlog in order for agencies to more effectively use grant funding aimed at testing the kits. The results of this research will provide valuable information to enhance sexual assault kit tracking methods.

21 *The Great Exhibition of 1851's Influence on Museums*

Maria Dangelo

Junior | History and Political Science | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Jotham Parsons, Ph.D.

ABSTRACT:

The Great Exhibition of 1851 influenced museums that came after it. The growth of museums was beneficial to Britain in particular as the first real museum, the South Kensington Museum, which later became the Victoria and Albert Museum due to the patronage of Queen Victoria and her husband Albert, was in Britain. The bulk of the paper will explain the link between the South Kensington Museum, as well as smaller British museums that soon followed, and the Great Exhibition of 1851. Throughout all it is important to remember that neither the Great Exhibition of 1851, nor the South Kensington Museum could have been created without the care and patronage from Prince Albert. Furthermore, the influence of the Great Exhibition can be seen in the similarities and timing of the Exhibition and the South Kensington Museum. Additionally, the emergence of museums was beneficial to Britain, because as the public became more educated from the new museums Britain was able to remain powerful on the world scene. Overall, it can be seen that museums were influenced by the Great Exhibition of 1851 due to the set-up of museums, the public reaction to both, and the educational aspects of the exhibits.

22 *Plato's "Symposium" in Relation to Present Day Healthcare*

Corey Davis

Freshman | Nursing | School of Nursing

Faculty Advisor: Alessio Rotundo,

ABSTRACT:

The explanation of what love is has been debated for many centuries. In Plato's "Symposium," many

accounts of love are recorded; the focus of this research poster is on Diotima's and Eryximachus's accounts. Diotima, an expert in love, gives an account of the different ways, or levels, of love a human can experience within their lifetime. Eryximachus, a physician of the time period, discusses the difference between two types of "Eros," that found in a sick body, and that found in a healthy body. Relating these philosophical dialogues to present day healthcare, the poster explores the different levels of love, according to Diotima's scale, involved in a nurse-patient relationship and a physician-patient relationship. In addition, it also explores the differences between these two relationships and their affect on the maintenance and rehabilitation of a patient. The goal is to analyze the impact that varying amounts, and types, of love have on the healing process for one who is not at a high level of wellness.

23 *The 1950s: How the New American Dream of the Suburban Middle-Class Overlooked Racial Segregation in the Inner Cities*

Michael Deer

Junior | Political Science | McNulty College and Graduate School of Liberal Arts

Faculty Advisor: Andrew Simpson, Ph.D.

ABSTRACT:

The purpose of this research explores how the economic prosperity of 1950s middle-class America overlooked the struggling inner cities and their fight for civil rights. As the post-WWII mass-producing service economy prompted American affluence for suburban middle-class whites ("suburbanites"), America became the world's superpower. A new vision of the once distant American Dream had been reestablished, and those in the middle-class took full advantage of the economic perks. At the same time, however, Americans had forgotten a crucial aspect—its inner cities. The inner cities were predominantly African American, so both racial segregation and the Civil Rights Movement faced uphill battles, as middle-class whites controlled the spotlight.

This research will first examine the historic economic success of 1950s America, beginning with the leading contributors of the decade's affluence. Drawing from primary sources such as the National Center for Education Statistics, Bureau of Labor Statistics, Census Bureau, Congressional Budget Office, and The World Bank, it will show how the white middle-class lived comfortably in the suburbs. Middle-class whites flooded the newly constructed suburbs in hopes of finding a place to raise a family, while the racial inequality gap between African Americans greatly expanded during the fight for civil rights. The research will conclude by showing how the suburbs created massive inequality in the inner cities, both economically and racially, as explained by Lizabeth Cohen. It will also conclude with the present-day scrutiny of the American Dream, whereas many Americans disagree with its attainability given America's current economic standstill.

24 *Effects of Public Transportation on Unemployment*

Margo DeGenova

Senior | Legal Studies and Political Science | A.J. Palumbo School of Business Administration

Faculty Advisor: Patrick Deegan, JD, MBA, MS-ISM

ABSTRACT:

Past studies have established a relationship between unemployment and public transportation, and narrative evidence furthers the relationship, claiming that a lack of public transportation prevents employees from obtaining or holding a job. Furthermore, discrimination based on transportation is legal, and employers can turn away potential workers if they disprove of public transportation use. In my independent research project, I seek to determine the legal perspective of the relationship between unemployment and public transportation in the city of Pittsburgh, Pennsylvania through small-batch, intensive case studies. I want to specifically seek to determine if the bus routes of Pittsburgh impact job hiring or maintenance, and lawyers have the ability to analyze situations in a concentrated, logical manner and can possibly see effects through clientele. I seek to investigate further into this topic and note the relationship in Pittsburgh between unemployment and public transportation through the perspective of local attorneys.

25 Antibiotic prophylaxis failure among patients with spontaneous bacterial peritonitis: influence of antimicrobial agent, body mass index and prognostic score

Alexis DeLeo, Matthew Gatchel, Elizabeth Travers, Nicholas Verna, Priya Tomy
Senior | Pharmacy | Mylan School of Pharmacy
Faculty Advisor: Branden Nemecek, Ph.D.

ABSTRACT:

Patients with a history of spontaneous bacterial peritonitis (SBP) or who meet criteria for primary prophylaxis are prescribed antimicrobials based upon clinical guidelines, allergies and local susceptibilities. Several prophylactic regimens are prescribed and due to conflicting data, the ideal regimen to prevent subsequent infections is unclear in patients who are obese or across various MELD-Na (Model for End-stage Liver Disease [Sodium]) scores. The goal of this study is to compare the prophylactic failure for SBP by hospital admission among cirrhotic patients with SBP, with a focus on stratification across different body mass indices and MELD-Na scores.

****26 Ultrasound Biofeedback and the Treatment of Two School-Aged Girls With Speech Sound Disorders***

Paul DeLisio, Kaitlin Maize, Heather Rusiewicz, Ph.D.
Junior | Speech-Language Pathology | Rangos School of Health Sciences
Faculty Advisor: Heather Rusiewicz, Ph.D.

ABSTRACT:

The purpose of this study was to examine the efficacy of ultrasound visual biofeedback as a clinical treatment method for speech production. The aim of this study was to explore the (1) the effects of visual biofeedback presented via ultrasound on the production of two speech targets (i.e., vowel+consonant combinations) and (2) the generalization of treated targets to related untreated targets produced by a nine-year-old girl with severe childhood apraxia of speech (CAS) and a ten-year-old girl with a residual /r/ distortion. This study employed a single subject ABAB treatment replication research design across approximately 12 sessions for each participant. The use of a portable ultrasound

was used as the primary intervention cue for the 30-minute treatment sessions. Probe items consisted of trained and untrained targets to assess stabilization and generalization of speech production. Visual analysis of the data revealed an increase of accuracy of speech sound targets during treatment phases for both participants, though the effect sizes revealed a greater impact for the participant with severe CAS. This study adds to the growing literature base on the use of visual biofeedback for the treatment of speech sound disorders while offering the first data on a child with severe CAS. Additionally, this is only the second study to enroll females in such an investigation. These data suggest that further investigation of individuals with a variety of speech sound objectives (i.e. severe speech sound disorders, accent modification, etc.) using larger sample sizes is warranted.

27 *The Relationship of Exercise, Academic Achievement, and Anxiety Levels*

Jannah Delmonico

Junior | Early Childhood Education | School of Education

Faculty Advisor: William Casile, Ph.D.

ABSTRACT:

The purpose of this study is to determine whether or not there is an impact on academic performance when exercising. Additionally, if anxiety levels are lower or higher after exercising. There are many other factors contributing, like sex and race, which made it hard to conclude other research. This research hopes to close the gaps in previous research about academic performance, anxiety, and exercise. College age females will be asked to respond to an anonymous survey regarding their exercise habits, general anxiety levels, and grade point average. Once subjects are recruited, they will be directed to the online survey and encouraged to share the link with others. Subjects will be presented with an informed consent prior to starting the survey and they can choose to participate or withdrawal at any given time.

28 *Doomed to Repeat it: The 100, Fan Backlash, and Why Hollywood Can't Stop Killing Lesbians*

Kate Dessart

Junior | Digital Media Art | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Maggie Patterson, M.F.A.

ABSTRACT:

On March 3rd, 2016 a highly anticipated episode of *The 100* aired. Much to the showrunners' surprise, that night a revolution occurred online from upset fans. Side character Lexa, sapphic love interest to the main character, took a bullet meant for said character and died. However, the showrunners argued, this death was necessary to the season's storyline and scheduling concerns with the actress. So why the reaction? This paper uses that episode as case study and looks at statistical evidence on representation of lesbian and bisexual characters in scripted television. Pairing Cedrick Clark's theory of the evolution of minority representation in the media with the specifics of Lexa's death, the Bury Your Gays trope, and queerbaiting in off-show media paints a picture of why fans felt betrayed. While examples like Wynonna Earp signal the medium's crawl towards Clark's final stage of respectful representation for bisexual and lesbian characters, American television seems to be taking "two steps forward and one step back." Fans' outcries about Lexa's murder appear to reflect their objections to an outmoded trope.

29 *Improving the Reliability of the Justice System through the Science of DNA Profiling*

Dana Dryzal

Freshman | B.A. Biochemistry, M.S. Forensic Science & Law | Bayer School of Natural and Environmental Sciences

Faculty Advisor: Timothy Evans, Ph.D.

ABSTRACT:

Before DNA was discovered, investigators depended on other evidence including eyewitness testimony and confessions to build their cases; however, these methods were potentially unreliable and inaccurate. Because of this, numerous individuals were erroneously convicted and incarcerated, or in some unfortunate cases, sentenced to death. With the discovery of DNA profiling nearly 30 years ago, several scientific techniques are now employed to provide a more reliable indication of guilt or innocence.

The process of DNA profiling begins with obtaining a sample. Because it is easy to leave DNA evidence, samples can be obtained from a wide range of sources. While large amounts of DNA were needed for analysis in the past, the amplification of DNA through polymerase chain reaction (PCR) can produce DNA profiles from minute amounts of evidence, such as saliva on a cigarette butt. Once the sample is collected, the DNA profile is generated using different methods of analysis depending on the quality and quantity of the sample. Short tandem repeat (STR) analysis is most popular, for it focuses on 13 specific loci to compare between individuals. When the probabilities of each genotype frequency are added together, the chances of two people having the same DNA profile can decrease to as low as one in 3,000,000,000,000. Other DNA analysis methods can be utilized when generic STR analysis is unavailable. DNA is 99% similar between any individual; however, focusing on individually characteristic regions while using accurate analytical methods has revolutionized perpetrator identification.

30 *Bacterial Genomes Involved in Acid Mine Drainage*

Kayla Limani

Senior | Biology | Bayer School of Natural and Environmental Sciences

Faculty Advisor: Nancy Trun, Ph.D.

ABSTRACT:

Throughout the four seasons, soil samples were isolated from Wingfield Pines, an abandoned coal mine located in Allegheny County, Pennsylvania. Single colonies of bacterial species were grown and isolated from these samples, and glycerol stocks of each of the bacterial species were made and kept frozen. The samples from pond 28 obtained during the spring of 2015 were used in this experiment. Polymerase chain reactions (PCR) were performed on each sample to amplify the DNA segments for sequencing reactions. Sequencing these bacterial samples is important for identifying the species present in the remediation center, differentiating the genomic makeup from the different ponds and seasons, and understanding if each species of bacteria present is helping or hindering the remediation process. The genomic sequences were then used to develop primers for each species and tested for optimal operating conditions to quantify the amount of certain species within Wingfield Pines.

***31 Computational Modeling of the Heat Equation with Material Applications**

Connor Evans

Junior | Biomedical Engineering | Biomedical Engineering

Faculty Advisor: John Viator, Ph.D.

ABSTRACT:

The Heat Equation is a parabolic partial differential equation which describes the distribution of temperature in a given region as a function of space and time. This equation is based on the classical Fourier theory of heat conduction and is widely used for modeling the heating of materials. In solving the heat equation, one must consider numerous initial and boundary conditions relating to initial temperature, temperature at the boundaries, and physical properties of the material. Solutions to this equation are characterized by a gradual smoothing of the initial temperature distribution by the flow of heat from warmer to colder areas of the object. Computational models of solutions to the heat equation in various dimensions have been constructed with MATLAB software. These models may be applied to real-world materials and heat profiles may be generated for materials with different thermal conductivities and boundary conditions. Such heat profiles reflecting thermal conductivity are essential pieces of information needed to ensure proper functionality when deciding to implement materials in the design of products for interaction with physical systems.

32 Music and adherence in upper extremity home programs post-stroke

Joanna Eskander, Sarah Wallace, Lauren Matthews

Senior | Occupational Therapy | Rangos School of Health Sciences

Faculty Advisor: Elena Donoso Brown, Ph.D., OTR/L

ABSTRACT:

Rehabilitation professionals often design home programs to support additional or continued practice of valuable interventions at home. In occupational therapy, this strategy is of particular value when working with persons post-stroke on upper extremity motor function due to the need for intense repetitive practice. However, research suggests that adherence to home programs is typically low (Jurkiewicz, Marzolini, & Oh, 2011). The purpose of this pilot study was to measure the quantity of practice within, and adherence to, an upper extremity home program with and without music designed for people post-stroke who also have a communication impairment known as aphasia. The study used an alternating treatment single-subject design with pre- and post-test measures. To be included in the study, participants had to be in the chronic phase of stroke recovery, have mild to moderate aphasia, and have hemiparesis. The researchers designed each participant's home program based on motor abilities in the upper extremity and participant goals. Materials were modified to support participant's language impairment. During designated weeks, participants practiced with an personalized music playlist compiled by a music therapist. Initial data analysis (n = 5) found that a majority of participants demonstrated a statistically significant change in adherence between phases. Additionally, all participants reported changes in performance, while four out of five indicated gains in satisfaction with upper extremity use. These initial findings suggest that the use of music in upper extremity home programs may serve as a low cost modifier for adherence.

Jurkiewicz, M. T., Marzolini, S., & Oh, P. (2011). Adherence to a Home-Based Exercise Program for Individuals After Stroke. *Topics in Stroke Rehabilitation*, 18(3), 277-284. doi:10.1310/tsr1803-277

33 Assessment of Duquesne University Physician Assistant Student Knowledge Regarding Medical Errors and Disclosure Practices

Tara Ferguson

Sophomore | Physician Assistant | Rangos School of Health Sciences

Faculty Advisor: Bridget Calhoun, Ph.D.

ABSTRACT:

Medical errors pose serious and life-threatening consequences to patients. According to the 2000 Institute of Medicine Report, "To Err Is Human: Building a Safer Health System", between 44,000 and 98,000 patient deaths occur annually due to medical errors that could have been prevented. Effective disclosure and response to medical errors require adequate knowledge, training, and transparency. Medical cultural barriers such as silence and placing individual blame are many times attributed to errors rather than faulty systems and processes.

While there has been an increase in research on medical error and disclosure, there is little research and knowledge on the role physician assistants (PA) play in responding to, and addressing medical errors. Although this topic must be included in all accredited PA programs, the extent of which it's covered varies significantly. This project involved administration of a survey to Duquesne University PA students enrolled in all five years of the program. The goal was to assess student knowledge regarding medical errors and disclosure practices. The responses were intended to provide a baseline for the degree in which the current curriculum fully prepares students for preventing, recognizing, and reporting medical errors. Results demonstrate that the current Duquesne University PA curriculum provides fundamental training in the prevention and recognition of medical errors as student's progress through the program. However, there is evidence of limited knowledge and comfort regarding when and how medical errors are to be disclosed. These results further substantiate the need for organized pre-clinical curriculum regarding the role of the physician assistant in preventing, recognizing, and reporting and disclosing medical errors to improve patient safety.

34 The Effect of Media on Political Ideology

Elizabeth Ferrara

Sophomore | Psychology | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Elizabeth Bennett, M.A.

ABSTRACT:

It is understood that genetics play a role in our political ideology and it is known that media has a large effect on our daily lives from how we perceive ourselves, others, to how we understand the world around us (Ksiazkiewicz et al). However, to what extent does the media effect our political ideology? This study wishes to further understand which plays a bigger part in the political ideology of society: the media or genetics. This study would use a mix methods procedure starting with interviews to see what each participant's current political ideology is and where they feel they received their ideas. This study

would then try to quantify the participant's level of political ideology, using the Social and Economic Conservatism Scale (Everett). After a series of tests and exposure to different forms of media, this study would try to quantify their political ideology again to see if there was a change in their thoughts just on the exposure to media.

35 Resilience to Trauma: Authoritarian Philosophies and Approaches

Brendan Gebler

Senior | Psychology | McNulty College and Graduate School of Liberal Arts

Faculty Advisor: Elizabeth Bennett, M.A.

ABSTRACT:

Many people will experience a traumatic event in their lifetime; however, only a relatively small minority of people develop symptoms of Post-Traumatic Stress Disorder (PTSD). Traumatic experiences can take many forms, from accidents, to assaults, to combat experiences, though most individuals exposed to traumatic experiences remain resilient to PTSD and its associated symptoms. The study of resilience, particularly with regards to symptoms of PTSD, has become extremely important as we seek to assist and treat individuals who have exhibited symptoms of PTSD. One common factor in resilience to PTSD and trauma-related symptoms is cognitive functioning. Reduced hippocampal volume, which is associated with memory storage and retrieval, and cognitive impairment are associated with PTSD. Pertinent to this research is that fact lower cognitive functioning is also associated with authoritarian approaches towards leadership, religion, and parenting. Additionally, authoritarian philosophies are in turn linked to anxiety and lower self esteem. This research seeks to examine a possible relationship between authoritarian views and a reduced resilience to symptoms associated with PTSD. The goal of this research will be to explore a conceptual link between the authoritarian approach to authority and resilience to PTSD. Concurrently, this research hopes to highlight leadership strategies that could lead towards improved retention within professions whereby individuals are likely to encounter traumatic events.

Keywords: authoritarianism, authoritarian personality, authoritarian parenting, Post Traumatic Stress Disorder (PTSD), resilience

36 Sleep Tight: Insomnia and it's Treatments

Sara Getsy

Sophomore | Pharmacy | Mylan School of Pharmacy

Faculty Advisor: Amanda Lowe, Ph.D.

ABSTRACT:

Countless people are affected by the inability to sleep which often negatively impacts personalities and relationships. Insomnia is one of the most common sleep disorders and it is defined by the difficulty initiating and/or maintaining sleep and reoccurring interrupted sleep. This disorder affects individuals in various ways such as lack of concentration, reduced energy and memory problems. Research shows that people with chronic insomnia also have a higher risk for depression and anxiety disorders. While this condition can be very severe and irritating to the people who are affected by it, there are several

treatments to reduce insomnia and lead to a better night's sleep. Treatments such as cognitive behavioral therapy(CBT) involve techniques in developing habits that promote healthy sleep, and altering thoughts and actions that negatively affect one's ability to sleep. The various methods of CBT include stimulus control, sleep restriction, sleep hygiene and psychotherapy. Cognitive behavioral therapy can be very effective in treating insomnia and the effects are often maintained after treatment as well. Other methods of treating insomnia include medications such as benzodiazepines, non-benzodiazepines and other hypnotics. While these drugs can be extremely successful in treating insomnia, they can also be highly addictive and should be taken with care. The goal of this poster is to analyze the fundamentals of insomnia and the various treatments for it, as well as the effectiveness of both pharmacological and non-pharmacological treatments.

37 *The Women's Building : A Platform for the Achievements of Women*

Cassidy Glatz

Sophomore | Secondary Education and History | School of Education

Faculty Advisor: Jotham Parsons, Ph.D.

ABSTRACT:

The 1893 World's Fair in Chicago displayed the newest technologies, discoveries and entertainment for its visitors. It was also the first World's Fair to have a women's exhibit curated and managed by women. The Women's Building was used as a social platform in which the women's movement displayed the advancements of women at the time. It featured women in traditionally male dominated fields such as law and medicine while advocating for working conditions of women in industry. Yet this idea was not entirely satisfied; though the Women's Building was meant to advocate for women in the industrial field, very little of this occurred and the exhibits mainly focused on the achievements of women in a variety of fields. And not all women were represented in part due to the Board of Lady Managers' white elitist status, so that many real issues that effected the lower class and the achievements of racially diverse women were underrepresented. Despite this, however, the building's inclusion in the 1893 World's Fair represented the socially and politically shifting ideologies of American society in regards to women. Its inclusion was symbolic of achievements of, not only women, but of the women's movement as a whole.

38 *Particle Detector for Probing the Proton*

Justin Goodwill

Senior | Physics | Bayer School of Natural and Environmental Sciences

Faculty Advisor: Fatiha Benmokhtar, Ph.D.

ABSTRACT:

The structure of the proton is one of the most prevalent mysteries in Nuclear Physics, and substantial efforts are being invested from both experimentalists and theoreticians from all over the world to investigate it. Particle accelerators like the one at Jefferson Lab are high energy probes that allow physicists to see inside the proton. Our interest focuses on the contribution of the strange quark, the

third lightest quark, to the proton. Because quarks cannot be detected by themselves, the only evidence that the strange quark exists is to detect a particle that has it in its ground state such as a kaon.

The lifetime of kaons is extremely small, and one has to separate it from other particles that can elude its identification. For this purpose, a new particle detector called a Ring Imaging Cherenkov Counter (RICH) is being built for Jefferson Lab. I had the chance to participate in the detector tests last summer, thanks to the Department of Energy (DoE) summer internship, and I continued my work on software development for the detector since then at Duquesne. I am going to present the theory behind the investigation of the proton constituent and the experimental aspect of studying the strange quarks and detecting kaons. I will then present my contribution to the RICH project and the status of my work on the software development. Finally, I am going to show the expected results for the strange quarks measurements.

39 HPV Project

Molly Graveno, Choniece Phillips

Senior | Pharmacy | Mylan School of Pharmacy

Faculty Advisor: Robert Laux, Pharm.D

ABSTRACT:

The goal of the HPV Project is to educate and inform the college-aged population about the Human Papillomavirus, its health implications, and the HPV vaccine. Student reported data from educational awareness events surveys was analyzed to identify correlations between religion, parental beliefs and other factors that influence the decision to receive the HPV vaccine. Students reported that even though they are technically adults, their parents still make the majority of their health decisions including the decision to get the vaccine or not. However, none of the students reported that their decision to get the vaccine was influenced by their religious beliefs. Over ninety percent of participants that have not received the vaccine now that they have been educated about the health implications are willing to receive the vaccine. While religion does not apparently impact the decision to get the HPV vaccine, parental influence is crucial and is now the target for the educational campaign.

40 Talk Less, Smile More: How Supplemental Education is the New Textbook Education

Emily Grecco

Senior | Dual Degree Secondary Social Studies Education and History | School of Education

Faculty Advisor: Patricia Sheahan, Ph.D.

ABSTRACT:

In the school of education, future educators are being taught different techniques of how to make their students more engaged in the classroom. One of the ways to do this is to create the lesson with the students' interests in mind. This can be done by relating the content being taught to something of current interest. By making this simple transition from traditional classroom teaching, students' level of retention of and motivation to what is being taught can improve greatly. The musical, Hamilton, is an example of this point. This musical presents the life and accomplishments of Alexander Hamilton through rap music to the viewing audience. Not only can this way of learning be done for historical

content, the creator of the musical, Lin Manuel Miranda, encourages youth in the New York Public Schools to create their own rap/musical songs or plays in a way in which it will help them learn and retain the information needed through a program called 'EduHam'. This program models the effect of supplemental education and its role in the general education classroom. When comparing the outcome of student learning from a text book lesson, that is cut and dry, to a lesson written with support from Hamilton, the students could retain the information better and be more involved in the classroom. They also enjoyed learning information in a way that kept their interest in the subject. This goal of this project is to prove that supplemental education is the new textbook education.

41 Drug Use: An Investigation of Counterproductive Work Behavior in Academia

Angela Griffo, Mary Comis

Sophomore | Psychology | McNulty College and Graduate School of Liberal Arts

Faculty Advisor: Elizabeth Bennett, M.A.

ABSTRACT:

The purpose of this conceptual research is to identify how substance use and narcissistic qualities potentially correlate with counterproductive work behavior in students in an academic environment. The survey administered for this research was aimed to synthesized information using techniques such as the 24-item Counterproductive Behavior Measure: From Development of a Measure of Workplace Deviance by Rebecca J. Bennett and Sandra L. Robinson, which measures the severity of counterproductive work behavior in conjunction with an academic environment on a 1-7 point Likert scale, where 1 is equivalent to never and 7 is to daily. Other methods include the 40-item Narcissistic Personality Inventory Measure where narcissism can be depicted based on two scenarios participants are given for each of the 40 items (Raskin & Hall, 1979), as well as categorized questions concerning the frequency of usage with alcohol, marijuana, and other illicit drugs. The survey was completed by 120 participants, but is expected to receive more in the following weeks due to an updated projection on Facebook as well as being offered as a bonus assignment for a psychology research methods class. The researchers hypothesized that drug use and narcissistic behavior contribute to counterproductive behavior in academia, ultimately resulting in lower performance, derailed focus, and lower motivation to learn. Analyzing the collected data will provide an answer as to whether the correlation between drug use, narcissism, and counterproductive work behavior can be proven true or problematic, and help the researchers assert what action should be taken to solve this occurrence.

42 Imagination vs. Logical Thinking: The Difference in Imagination between a Higher-Level Learner and a Lower-Level Learner

Morgan Hamby

Senior | Early Childhood Education | School of Education

Faculty Advisor: Sandra Quinones, Ph.D.

ABSTRACT:

Imagination is the ability of forming mental images or concepts of what is not actually present to the senses. Imagination is existent in a majority of individual's daily routines, whether it is conjured

stereotypically or through hypotheses, yet is rarely talked about beyond adolescence. At some point in a person's life, creative imagination is deemed 'no longer necessary' and logistical thinking takes prominence; the effects of this can be seen as early as 3rd grade, where students struggle with creative writing prompts. This field experience inquiry project examines the creative thinking of two students, who have the same demographics except for the fact that one was deemed a lower-level learner, and the other, a higher-level learner. The students were given a wordless picture book and were asked to tell the story. Based on the comparisons, the research concludes with a discussion of practices to assist creative thinking in the classroom and provides insight by what we can learn from implementing imagination as well as the benefits by which imagination can be executed.

43 Discovery of a poly-halogenated compound from a Curaçao cyanobacteria

Edward Hilton, Corinne Staub, Neil Lax, Benedict Kolber, Kevin Tidgewell
Senior | Biochemistry | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Kevin Tidgewell, Ph.D.

ABSTRACT:

Cyanobacteria are photosynthetic prokaryotes found in diverse terrestrial and aquatic habitats. Secondary metabolites produced by marine cyanobacteria exhibit pharmacological activity including anti-cancer, anti-viral, and anti-bacterial activities. In addition, some of these compounds resemble endogenous ligands to mammalian receptors. Our lab is interested in discovering novel compounds from cyanobacteria that have activity at targets involved in CNS disorders, such as serotonin receptors. A marine cyanobacterium, field classified as *Symploca*, was collected off the coast of Santa Barbara Beach, Curaçao and was subjected to dichloromethane/methanol extraction and fractionation by column chromatography. Through the Psychoactive Drug Screening Program (PDSP), fractions were tested against G-protein coupled receptors for IC₅₀ determination and Fraction F showed affinity for the serotonin receptor subtype 2C (5-HT_{2C}). Initial isolation through HPLC was contaminated due to a plasticizer, dioctyl phthalate. Techniques utilizing a methanol/water gradient in a Strata-X column to remove the contaminant were developed and applied to the isolated compounds. Utilizing 1D H-NMR and 2D COSY, HMBC, and HSQC NMR techniques as well as LC-MS, the compound of interest appears poly-halogenated due to the isotopic abundance ratio in the mass spectrum of the compound as well as the carbons within the chlorination range in the NMR spectra. Other poly-halogenated marine compounds such as dysidenin and barbamide are related compounds found in similar locations that the compound of interest is likely an analogue of. Structure elucidation of the isolated compound is underway.

44 Optical and electronic design for a part-per-million laser wavelength meter

Tim Ireland, Isaac Davies, Jake Kline, Jahnavee Mittal, Gage Tiber
Senior | Physics | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Ted Corcovilos, Ph.D.

ABSTRACT:

Michelson interferometry is a standard method for measuring the wavelength of unknown light sources. We describe a new design using improved retroreflectors and a modern digital interface. Diagnostic data

show that the device can measure unknown optical wavelengths to part per million precision and accuracy by comparing the unknown laser to a stabilized Helium-Neon reference laser.

45 Synthesis and Physicochemical Characterization of Quaternary, Narrow-Bandgap Tellurides

Brea Hogan

Senior | Biochemistry / Forensic Science and Law | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Jennifer Aitken, Ph.D.

ABSTRACT:

The efficiency of thermoelectric materials is defined by the dimensionless figure of merit, ZT. The electrical conductivity (σ) and the Seebeck coefficient (S) are directly proportional to ZT while κ , the total thermal conductivity, is inversely related to ZT at absolute temperature (T). Currently, most thermoelectric materials are impeded by a ZT value of approx. 1. The scientific problem within the field of thermoelectrics is to develop efficient materials that have low thermal conductivity, high electrical conductivity and high Seebeck coefficient values. Quaternary, diamond-like semiconductors have recently demonstrated ZT values that are suitable for thermoelectric applications at elevated temps. We propose that compounds such as $\text{Cu}_2\text{ZnGeTe}_4$, $\text{Cu}_2\text{FeGeTe}_4$ and $\text{Cu}_2\text{MnGeTe}_4$ will possess promising properties for high temp. thermoelectric applications due to relatively low thermal cond., high Seebeck coefficients and thermal conductivity that could later be tuned via the formation of solid-solution. The semiconductors have been synthesized via high-temp. solid-state techniques, and the phase purity of the samples was assessed using X-ray powder diffraction (XRPD) and Scanning Electron Microscopy (SEM) coupled with energy dispersive spectroscopy (EDS). Differential Thermal Analysis (DTA) and UV-Vis-NIR spectroscopy have been used to study the thermal behavior and optical bandgaps of the materials.

46 Identification and Manipulation of Iron-Reducing Bacteria at Wingfield Pines for Iron Agar Bead Filtration System

Rachel Irvin

Senior | Biology | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Nancy Trun, Ph.D.

ABSTRACT:

The Passive Abandoned Mine Bioremediation System at Wingfield Pines located in Bridgeville, Pennsylvania was engineered to efficiently decrease the overall concentration of various metals, such as iron and aluminum, and undo the damage caused by Acid Mine Drainage (AMD). In order to further aid in the bioremediation system of Wingfield Pines, a filtration system using inoculated agar beads was designed to determine if the excess growth of iron-reducing bacteria could lower the concentration of iron. The most common bacteria found were *Pelobacter*, a member of the Pelobacteraceae family, with a percent identity and query coverage of over 97%. The Iron Sulphite was transformed into agar beads and inoculated with the iron-reducing bacteria, in order to test the ability of the bacteria to lower the overall concentration of iron in the Wingfield Pine's water. The agar bead filtration system has created a

powerful and efficient way to promote the removal of iron from Wingfield Pines by manipulated iron-reducing bacteria.

47 Use of N-acetylcysteine for non-acetaminophen related acute liver failure at a tertiary care center

Megan Jackson, Hannah Cawoski and Hannah Mazur

Senior | Pharmacy | Mylan School of Pharmacy

Faculty Advisor: Lauren Finoli

ABSTRACT:

N-acetylcysteine is first line treatment for patients with acetaminophen toxicity due to accidental or intentional overdose. In patients with toxic serum levels of acetaminophen, the use of N-acetylcysteine has shown to improve overall health outcomes, particularly an improvement in patients' liver function.

N-acetylcysteine eliminates the toxic amounts of acetaminophen metabolite through a known mechanism, however, may also benefit and improve the health outcomes of patients with non-acetaminophen induced acute liver failure according to more recent literature¹. The purpose of this project was to therefore characterize the use of N-acetylcysteine at a tertiary care facility and improvement in laboratory parameters in patients in which N-acetylcysteine was prescribed for indications other than acetaminophen toxicity.

48 Duquesne University Students Are Unaware of Local Public Health Threats

Kristen Kotsopoulos

Sophomore | Physician Assistant Studies | Rangos School of Health Sciences

Faculty Advisor: Bridget Calhoun, Ph.D.

ABSTRACT:

According to statistics disseminated by researchers from the University of Pittsburgh Graduate School of Public Health, Allegheny County has higher rates of premature death attributable to colon cancer, breast cancer, cardiovascular disease and youth homicide when compared to other US cities of similar size. Unfortunately, Allegheny County also ranks above average with infant mortality. When these statistics were discussed in an undergraduate course here at Duquesne University (Disparities in Healthcare), most students were shocked, and admittedly unaware of these regional public health threats. All students enrolled in that course were health science students, and thereby surprising that so many were not aware of local rates of these conditions. That was the impetus for this project that involved the distribution of a brief survey to students currently enrolled at Duquesne University. The goal was to document the extent of public awareness of these topics. Respondents were asked to identify the five conditions that are responsible for higher rates of premature death from a list of 11 conditions. Results from 213 completed surveys demonstrated a wide ranging unawareness regardless of age, gender and school in which the students were enrolled.

49 *Bioinformatics Analysis of Antibody Drugs for Citrulline-Containing MHC-II Ligands; Implications for Pharmacokinetics of Biotherapeutics in Patients with Autoimmune Diseases*

Kathryn Kerr, Lauren A. O'Donnell, Ph.D.

Senior | Pharmacy | Mylan School of Pharmacy

Faculty Advisor: Wilson S. Meng, Ph.D.

ABSTRACT:

The purpose of this research is to identify potential immunological cross-reactivity between antibody drugs and autoimmune epitopes. Citrulline is generated from the amino acid arginine; this post-translational modification is associated with inflammation. Antibodies against citrulline in structural proteins are present in patients with rheumatoid arthritis (RA) and are an important marker for diagnosis and prognosis of the disease. One major issue with biologic drugs used to treat RA and other autoimmune conditions is that over time, their efficacy ceases due to the body developing an immunologic response to them. We speculate that this increased immune elimination is due to citrullination of arginine-containing peptide sequences within these drugs. To evaluate this hypothesis, we scanned a panel of biotherapeutics for potential epitopes of CD4 T cells. We used the Immune Epitope Database (IEDB) to predict ligands in the drug sequences for HLA-DRB1*0401, a human MHC class II molecule associated with increased risk of RA. The ligands containing arginine (thus potential sites for citrullination) ranked within the fifth percentile were further evaluated using the IEDB Epitope Analysis Resource in order to determine their immunogenicity. The method can be used to evaluate the immunogenicity of biotherapeutics, through both predication via IEDB as well as identifying MHC-II ligands containing arginine. Identification of immunogenic citrulline-containing epitopes can improve the understanding of immune clearance of biotherapeutics.

50 *Differential cytokine expression in neonates without adaptive immunity during a viral CNS infection*

Alison Kuhn, Lauren O'Donnell, Priya Ganesan, Abby Dunphy

Senior 5th year | Pharmacy | Mylan School of Pharmacy

Faculty Advisor: Lauren O'Donnell, Ph.D.

ABSTRACT:

Damaging neurological consequences such as seizures and death occur due to viral infections in the central nervous system (CNS). Deficiencies in neonates are present in both the immature innate and adaptive immune response. In order to study viral CNS infections in neonates, we use a transgenic mouse model of neuronally-restricted measles virus (MV) infection (NSE-CD46 mice), where the human isoform of CD46, a MV receptor, is expressed under the control of the neuron-specific enolase promoter. Adult CD46⁺ mice survive infection and control MV in an interferon-gamma (IFN γ)- and T cell-dependent manner. In contrast, neonatal CD46⁺ mice succumb to the infection despite T cell infiltration into the brain parenchyma. CD46⁺/RAG2-KO neonates, which lack T- and B-cells, experience less severe disease, prolonged survival, and lower viral load compared to CD46⁺ neonates. We hypothesize that CD46⁺/RAG2-KO neonates will show enhanced expression of key anti-viral cytokines (e.g. IFN γ and C-X-C chemokine 10 (CXCL10)) throughout the MV infection. Brain lysates from MV-infected neonatal CD46⁺

mice (cerebellum and hippocampus) were selected at 3, 7, and 10 days post-infection (dpi). By selecting these time points, we can assess the expression and signaling of cytokines through the innate (3 dpi) and adaptive (7 and 10 dpi) phases of the immune response. Western Blot analysis will be performed for the anti-viral factors IFN γ and CXCL10 and for activation of downstream signaling proteins (STAT1, ERK-1/2). Current studies aim to explore the role of CXCL10 in the infiltration of immune cells in the CNS and IFN γ in immune cell activation.

51 *Finding the Messiah*

Richard Kushay

Freshman | PA and Spanish | Rangos School of Health Sciences

Faculty Advisor: Kevin Mongrain, Ph.D.

ABSTRACT:

Many major religions have a Messiah, specifically an incoming one. We see this in sects of Hinduism and Buddhism in the East, but most prominently in man's quest for a savior in the major Abrahamic religions. Christianity is an obvious member of this group, as adherents follow Jesus Christ, believing him to be the promised Messiah of the Jews who came for the whole world as part of the New Covenant. The Jews themselves are still waiting for their Messiah, considering Jesus simply a prophet. Orthodox sects still look to the teachings of the prophet Isaiah and others as they pray for the Messiah's coming. The Muslims also consider Jesus a prophet, but believe, like the Christians, that he will have a second coming in support of the actual Messiah, called the Madhi. According to the Hadith, for he does not appear in the Quranic text, the Madhi will rule the world before judgment day.

At their cores, each religion offers hope in a monotheistic God and his representative savior or anointed one on earth. But despite similar origins and core theologies, they have radically different impacts on the world and interact with each other in a variety of ways. Examining and comparing sacred texts and the writings of leading theologians lends itself to understanding the differences in how each faith views salvation. This is crucial for understanding how these religions interact in an increasingly global world, regardless of disagreements between the sects of these three religions.

52 *Antimicrobial Stewardship in Dental Practice: The Development and Impact of a Pharmacy-Led Intervention*

Natalie Kokta, Anthony J. Guarascio, PharmD, BCPS

Senior | Pharmacy | Mylan School of Pharmacy

Faculty Advisor: Autumn Stewart, PharmD, BCACP, CTTS

ABSTRACT:

Objectives: Antibiotics are one of the most commonly prescribed medications in dental practice, primarily for orofacial infections. Previous research suggests that knowledge deficits related to prophylactic antibiotic use, hypersensitivity reactions, and antibiotic selection may contribute to inappropriate use, while antibiotic prescribing trends are influenced by prescriber confidence and patient satisfaction. Pharmacists have the unique opportunity to influence the use of antibiotics through collaboration with a variety of healthcare professionals, including dentists. The primary objective of this

study is to assess the impact of a pharmacist-led intervention on dental providers' knowledge and attitudes towards appropriate antibiotic prescribing and use. The study aids in advancing what is known about interventions targeted at improving the antibiotic prescribing practices of dental providers.

Methods: This is a quasi-experimental study using mixed qualitative and quantitative survey methods among a convenience sample of dentists before and after a pharmacist-led educational intervention. The intervention included a training video and dissemination of a "Pocket Guide" on antimicrobial stewardship in dental practice. Survey items measured knowledge of: antibiotic selection, dosing and duration for prophylaxis and treatment of common odontogenic infections. Likert-type questions assessed provider attitudes towards antimicrobial stewardship and patient expectations for antimicrobial therapy. Demographic variables were also collected. Pre- and post-survey responses will be compared using descriptive statistics to assess the impact of the pharmacist intervention on knowledge and attitudes related to antimicrobial prescribing.

Results: Results suggest a trend towards improved knowledge and awareness of patient influence on prescribing.

53 Examining the Penn Plaza Redevelopment from a Sociological Perspective

Rianna Lee

Senior | Sociology, International Relations | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Michael Irwin, Ph.D.

ABSTRACT:

Throughout its long history, the urban neighborhood of East Liberty has proven itself vital to the cultural, economic, and ecological environment of Pittsburgh. Once plagued by the failures of post-WWII Urban renewal projects, East Liberty has slowly recovered, establishing a strong presence in the commercial and residential market while remaining ecologically sustainable. The Penn Plaza redevelopment, an infrastructure project to remodel and update the existing high-rise apartments established during Urban Renewal, as well as add a shopping plaza, is still in the early stages of development. So far, the project has mixed support among community members, some of whom believe the project is being mismanaged and will have social, economic, and environmental consequences. Through my research, I will analyze the Penn Plaza redevelopment from a sociological perspective, with a focus on how the new infrastructure will impact the community positively and negatively.

***54 Modification of an Implant Material**

Emily Leung, Nina A. Reger, Ashley Blystone, Ellen S. Gawalt

Sophomore | Biochemistry | Bayer School of Natural and Environmental Sciences

Faculty Advisor: Ellen Gawalt, Ph.D.

ABSTRACT:

Titanium metal is a commonly used implant material which can be colonized by bacteria. Biofilms are when bacteria colonizes, attaches to a surface, and immobilizes. Bacterial infections or biofilms are hard

to treat once formed on the surface of a metal implant. Coating the material may minimize bacteria attachment. Self-assembled monolayers are comprised of molecules that contain both a head and tail group, and can be used to coat metal to prevent biofilm formation and bacteria growth. 12-Mercaptododecylphosphonic acid self-assembled monolayers have a phosphonic acid head group and a thiol tail group, and a solution of 12-Mercaptododecylphosphonic acid in tetrahydrofuran was used to form self-assembled monolayers on the surface of titanium. Diffuse reflectance infrared Fourier transform spectroscopy was used to evaluate the attachment of the self-assembled monolayers. Alkyl-chain ordered self-assembled monolayers formed on the titanium surface, with the thiol tail group free at the interface for additional reactions. The monolayer attachment strength was further tested through acid, base, and tape tests.

55 *How Medical Care has Changed in Response to Ethical Debates*

Annamarie Lovre

Freshman | Physician Assistant | Rangos School of Health Sciences

Faculty Advisor: Anna Nicka, MPA, PA-C

ABSTRACT:

In 1951 a woman by the name of Henrietta Lacks died from systemic complications relating to metastatic cervical cancer. Lacks' cancer cells were extracted during her treatment and autopsy for laboratory evaluation and research. Scientists discovered that her cells grew at extraordinary rates and were viable in laboratory conditions, so the cells were cultured and sent to researchers throughout the world. Lacks' unique cells would go on to aid in the development of the polio vaccine, modern laboratory techniques, and research into cancer. There are many ethical debates addressing the absence of consent for obtaining and distributing Henrietta's cells, lack of informing and compensating the family, and the lack of care given to Henrietta as a patient. Although situations in the past cannot be changed, much has been learned from the story of Henrietta Lacks and her family. This information has led to a revolutionary change within the healthcare system, specifically changing how medical providers are trained to thoroughly explain medical procedures as well as inform patients in regards to their diagnosis and care. The purpose of this research project is to explore how patient education, as well as medical provider education, has changed because of what has been learned from the ethical issues exposed within *The Immortal Life of Henrietta Lacks*.

56 *Egoism as the Blindfold of Lady Justice*

Claire Loretta

Sophomore | Forensic Science & Law | Bayer School of Natural and Environmental Sciences

Faculty Advisor: Jeff Lambert, Ph.D.

ABSTRACT:

The United States prides itself in being a country of resolute freedom. While the Constitution claims to ensure citizens' liberty and promote the general welfare of its citizens, there lies the fatal flaw in the very heart of the foundation – the integrity of the justice system and the need for conviction. This paper identifies the major failures of the current justice system, and explores an alternative justice system

through the lens of an egoist using classical texts from Thomas Hobbes and Plato, in addition to texts from modern-day thinkers. Based on the analysis, the paper concludes with the necessity for an intensive reformation and suggests beginning with the approach of egoism.

57 *Constructing a Traditional African Democracy*

Marguerite Madden,

Junior | Integrated Marketing Communications | McNulty College and Graduate School of Liberal Arts
Faculty Advisor: Gerald Boodoo, Ph.D.

ABSTRACT:

Africa is unlike any other continent in the world. With a median age of only 19.5 years, Africa is full of thriving youth that is determined to help their continent for the better. However, with their determination comes many setbacks. Throughout many African countries, citizens are faced with drawbacks from the various forms of democracy that are practiced throughout their country of origin. As a result of the impact Western colonial rule had over the continent, Africans are faced with many pressing challenges that inhibit the continent from reaching their full potential. The following project seeks to provide a discussion on how African countries can construct a democracy that incorporates African traditional values and helps the continent combat some of the most critical challenges that they face today. By presenting an overview of the impact colonial rule had on the continent, the various forms of democracy that exist within the continent, and African traditional values and religions, three central suggestions will then be made on how the construction of an African traditional democracy can go about. The suggestions brought forth have been formed while keeping in mind how large a continent Africa is and how different the countries are that exist within it. The hope is to not only form a traditional African democracy, but to also provide insight for tackling the issues they face in order to make the continent the best that it can be.

58 *Skin peptides from red-legged salamanders (Plethodon shermani) inhibit the chytrid fungus Batrachochytrium dendrobatidis.*

Andrew Magyan, Sarah Woodley

Senior | Biology | Bayer School of Natural and Environmental Sciences

Faculty Advisor: Sarah Woodley, Ph.D.

ABSTRACT:

Amphibians have experienced population declines for the past thirty years largely due to the *Batrachochytrium dendrobatidis* (Bd) fungus. Bd is a fungal pathogen that infects amphibian skin and restricts osmoregulation which can cause mortality. Some amphibian species are highly susceptible to the fungus, while others resist or tolerate infection. Understanding how amphibians defend against this fungus has important implications to maintain biodiversity and potential uses in the medical field to combat other fungi or bacteria. This study tested the growth of the Bd fungus when treated with salamander skin peptides to determine if susceptibility differences are due to the variations in natural peptide concentrations among species. It was found that skin peptides from *P. Shermani* successfully inhibited the growth of Bd at high concentrations. These results show that salamanders have a natural

defense mechanism to infection, and that peptides on the skin of salamanders have antimicrobial properties that could have potential uses in the fields of ecology or medicine. In future experiments, other amphibian species will be tested as well as a similar strain of pathogenic fungus, *Batrachochytrium salamandivorans*.

59 Cloning of the human relaxin 2 (RLN2) promoter for in vitro expression studies to investigate susceptibility to preterm birth

Lindsay Loughner, Taylor Pollock, Rachel Zapf, Sarah J. Carnahan-Craig
Junior | Forensic Science and Law | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Michael Jensen-Seaman, Ph.D.

ABSTRACT:

Relaxin is a hormone responsible for the loosening of pelvic ligaments and ripening of the cervix during childbirth. Relaxin 2 (RLN2) is a 6kDa peptide hormone encoded by the RLN2 gene on human chromosome 9p24.1. It is mainly produced in the decidua and the corpus luteum during pregnancy, and is active in facilitating the birth process. Increased RLN2 levels decrease the tensile strength of fetal membranes and can therefore cause early rupture of the fetal membrane, resulting in preterm birth (PTB). Past genetic association studies have linked serum RLN2 levels and PTB with a single nucleotide polymorphism (SNP) in the RLN2 promoter. Humans also have a highly variable microsatellite repeat within the RLN2 promoter. This study aims to investigate the functional variation in the expression of RLN2 with respect to the genetic variability in the CTnGAN microsatellite repeat and/or variation at SNP rs3758239. This will be done by cloning seven different haplotypes from a diverse human panel into a luciferase reporter vector. Luciferase activity will then be measured once the constructs are transfected into human JAR trophoblast cells. If it is found that this microsatellite and/or SNP do vary the expression of RLN2 in our in vitro expression assays, future work may examine the susceptibility to PTB based on womens' genotypes.

60 The Role of α -Arrestin Ubiquitination on Protein Stability

Faba Malik, Andrew Augustine, Josh Pirl, Jeff Brodsky and Allyson F. O'Donnell
Junior | Biology | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Allyson O'Donnell, Ph.D.

ABSTRACT:

Proteins are removed from the cell surface in response to environmental changes. The

α -arrestins are a critical class of protein trafficking adaptor needed for this regulated protein trafficking. Specifically, α -arrestins bind to the ubiquitin ligase, Rsp5, and recruit it to transmembrane cargo proteins. Ubiquitination of cargo serves as a mark for their internalization. However, the α -arrestin itself is also ubiquitinated and the functional consequence of this modification is unclear. Our goal is to define how ubiquitination impacts the function of α -arrestins Aly1 and Aly2. We make use of two Aly1 and Aly2 mutants: 1) PPxG mutants that no longer bind Rsp5, and therefore fail to ubiquitinate both α -arrestins and cargos, and 2) K-to-R mutants in which the ubiquitination site in Aly1 and Aly2 is mutated to

arginine to prevent a-arrestin ubiquitination but leave Rsp5-binding intact. We are assessing the impact these mutations have on Aly1 and Aly2 protein stability.

61 *The Influence of Genes on Intelligence*

Rebecca Marshall

Sophomore | Psychology | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Elizabeth Bennett, M.A.

ABSTRACT:

There have been many studies that have proved there is a connection between genetics and the environment. These studies started the argument of nature vs nurture. This proposed research will test the hypothesis that genetics has a stronger influence than environment on intelligence in human beings. It will be conducted through archival research of medical records, standardized test scores, and childhood socioeconomic surveys from a sample of 35 sets of twins who were separated at birth and 35 sets of twins who were not separated at birth. The research will consist of analyzing standardized test records to compare each set of twins, and particularly whether the twins who were not separated at birth have more in common due to their environment or not. The researcher will also compare the socioeconomic status of each child during their adolescence. The overall significance of this research will be a meaningful contribution to future research on the role of genetics implicating certain traits like intelligence.

Keywords: genetics, intelligence, twin study, archival data

62 Withdrew Submission

63 *Brain Asymmetry and Homicidal Tendency: a Forensic Science Perspective*

Erica Maney

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Faculty Advisor: Kathleen Roberts, Ph.D.

ABSTRACT:

The field of Forensic Psychiatry was slow to gain approval within the justice system, facing skeptics as to whether or not their testing methods were accurate enough to find those with serious mental illnesses. However, as time passed, forensic psychiatrists faced less of an obstacle as their testimonies were accepted in court. Within the past 20 years, the prevalence of serial killers has risen exponentially, giving law enforcement agencies the need to find a way to potentially stop serial killers before they commit their heinous crimes. Fortunately, psychiatrists were able to study serial killers already incarcerated and found that many exhibit symptoms of schizophrenia, if not already diagnosed. This project investigates how symptoms of schizophrenia can be seen not only with the outward actions and personality of the patient, but also within their brain. If a patient experiences severe trauma to one hemisphere, the other will be forced to become dominant which, in turn, can cause schizophrenia. This rapid change in dominance can cause the patient to experience psychopathy, another trait related to serial killings.

Overall, if brain scans were performed during incarcerations for smaller crimes, such as aggravated assaults or burglaries, law enforcement would have the chance to determine if the perpetrator was dangerous, or mentally unstable, enough to commit homicide at that given moment, potentially saving lives.

***64 Risperidone for the Treatment of Psychosis for Patients with Alzheimer Disease: A Meta-Analysis of Randomized Controlled Trials**

Michael McCombs

Junior | Marketing | A.J. Palumbo School of Business Administration

Faculty Advisor: Frank D'Amico, Ph.D.

ABSTRACT:

The number of people with dementia and Alzheimer's is expected to increase with the aging world population. It has been estimated that the prevalence of dementia doubles after the age of 65 years with Alzheimer's disease (AD) accounting for most cases of Dementia. Symptoms such as Agitation, Aggression, and Psychosis (delusions and hallucinations) complicate dementia. These affect the patient's quality of life and create stress for the caregiver. One management strategy for relieving symptoms is Risperidone (anti-psychotic prescribed medication). The purpose of this meta-analysis (MA) is to determine whether Risperidone is effective for treating the symptoms in patients with Alzheimer's disease. A systematic review of the medical literature performed by two investigators (MM, FD) resulted in four randomized controlled clinical trials all comparing Risperidone with Placebo. This project will perform a traditional meta-analysis pooling data from each of these four trials. For comparison purposes, both the fixed effect and random effect models will be applied when calculating the overall pooled treatment effect. Results will be graphical displayed in a forest plot showing the individual trial's data, their weights and the final weighted estimate. Each trial used the BEHAVE-AD (Behavior Pathology in Alzheimer's disease) rating scale to quantify behavior characteristics. The BEHAVE-AD scale is a 25-item questionnaire measuring seven symptoms: paranoid and delusion, hallucinations, activity disturbances, aggressiveness, diurnal rhythm disturbances, affective disturbance, anxieties and phobias. The sum of these subscales provides the various symptom scores with higher scores indicating greater level of that subscale.

65 The association between MELD-Na and clinical outcomes in patients with cirrhosis hospitalized with spontaneous bacterial peritonitis

Caitlin McHugh, Brandon Taylor, Gregory Caspero, Michael Steffes, Mehdi Hedjazi, Mary Kimmel, David Zimmerman, Dr. Branden Nemecek, Dr. Jordan Covvey, Dr. Anthony Guarascio

Senior | Pharmacy | Mylan School of Pharmacy

Faculty Advisor: Branden Nemecek, PharmD

ABSTRACT:

Purpose: Spontaneous bacterial peritonitis (SBP) is a bacterial infection in patients with cirrhosis with an estimated 30 percent mortality. The MELD score is a severity index on short-term mortality in cirrhosis

patients. Our goal was to evaluate outcomes during hospitalization for SBP using the updated MELD score, which includes sodium (MELD-Na).

Methods: This was a retrospective chart review including hospitalized patients treated with antibiotics for diagnosed/suspected SBP. Data was extracted from the medical record using ICD-9 CM coding for cirrhosis and SBP. Diagnoses were confirmed by a PMN count ≥ 250 cells/mm³ or bacteria in the ascitic fluid; other patients were considered to have suspected SBP if they were treated. MELD/MELD-Na scores assessed disease severity and patients were stratified into categories. Clinical outcomes included length of hospital stay (LOS), length of ICU stay, and in-hospital mortality.

Results: 251 patients were included in this study. Of these, 182 (72.5%) had confirmed SBP and 69 (27.5%) were empirically treated. Overall mortality was 11% with an average LOS of 11.5 days (SD ± 11). LOS was consistent among patients, regardless of MELD-Na score. Approximately, 37 percent of patients required ICU admission, with a mean LOS of 8.2 days (SD ± 8.8). A disproportionately high mortality (50%) and incidence of ICU admission (68%) occurred in patients with MELD-Na scores > 30 .

Conclusions: In our study, patients with SBP and higher MELD-Na scores had a higher risk of ICU admission and an increased mortality. This demonstrates that MELD-Na scores can serve as a predictive indicator in patients with SBP.

66 Gestures Produced by Children with and without Childhood Apraxia of Speech

Meghan McKenna, Elizabeth Foley, Hannah Bauer, Leah Shaheen, Alex McLeod, Dr. Heather Rusiewicz Senior | Speech-language Pathology | Rangos School of Health Sciences
Faculty Advisor: Heather Rusiewicz, Ph.D.

ABSTRACT:

The purpose of this study was to measure the frequency and types of gestures produced by children with childhood apraxia of speech (CAS) compared to their typically developing peers. CAS is a speech sound disorder that results from motor planning deficits and is characterized in part by frequent, inconsistent speech errors and reduced speech intelligibility. It was hypothesized that this reduced ability to produce accurate speech would increase manual gesture use as a compensatory mechanism in communication. In this exploratory study, six children between the ages of 3 and 5 (4 with CAS and 2 typically developing) completed a picture narration task presented via computer. The participants were encouraged to utilize both verbal expression and gestures while describing the scene. These videotaped samples were analyzed for types (i.e., deictic, representational, beat, head movements, facial expressions) and frequencies of gesture production, as well as the length, complexity, and accuracy of their spoken language samples. As expected, deictic gestures were produced with the greatest frequency for both groups, while no participant produced any beat gestures. Results indicated that three of the four participants with CAS produced increased gestures compared to the typically developing participants. These preliminary data suggest that more research is needed to study not only the production of gesture in children with speech and language impairments, but the potential impact of gestures on the ability of conversational partners to comprehend children's communication.

***67 Music Therapy and the Rehabilitation of Child Soldiers**

Christie McKernan

Senior | Music Therapy | Mary Pappert School of Music

Faculty Advisor: Robin Chapdelaine, Ph.D.

ABSTRACT:

This research project explores the implications of utilizing music therapy in the rehabilitation of child soldiers. Hundreds of thousands of children around the world are forced to fight for government and armed rebel forces around the world. These children experience a specific and comprehensive trauma that affects their ability to rejoin their communities upon escaping or being liberated from service. Due to the complex nature of trauma experienced by child soldiers, not many resources are available or equipped to deal with the intensive treatment necessitated by their experience. Child soldiers often return with posttraumatic stress disorder, affecting their ability to assume their previous role in the community. Music therapy is a unique form of treatment that approaches the human being as a whole, addressing various domains of human functioning. This holistic form of treatment can help assist child soldiers in orienting to their current situation, process their experiences through nonverbal and verbal outlets, and increase their sense of autonomy and control. In analyzing current research on music therapy as well as the multifaceted trauma experienced by child soldiers, this research sought to explore the implications of utilizing music therapy in rehabilitating this vulnerable population.

68 Generational Portraits: A Comparative Study of the Baby Boomer and Millennial Age Cohorts

Leah McKown

Sophomore | Sociology, Psychology, and History | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Sarah MacMillen, Ph.D.

ABSTRACT:

Generational conflict is, by no means, a new phenomenon. The historical record points to many instances where multi-generational relationships have been characterized by a pattern of intense differentiation. The American Counterculture of the 1960s and the Chinese Cultural Revolution constitute two such examples. On the surface, members of different generations seem to share many commonalities, but still tend towards an attitude of unfamiliarity and disdain. In an anecdotal sense, we are witnessing a rapid increase in cases of negative generational engagement, particularly between the Baby Boomer and Millennial cohorts. Paul Taylor (2016) of the Pew Research Center anticipates that America, in particular, is headed for a “showdown” between these two sizable groupings. Despite these trends, generational cooperation and understanding contains great potential for propelling societal growth and progress. The research included in the following report may serve as a starting point for recognizing the conditions and mechanisms at work within this broad and pervasive public issue. The project aims to identify, explain, and challenge these ideas by assessing economic, historical, educational, social, and political factors that influence the psychic, attitudinal, and moral outcomes of the members of each cohort. Areas for potential conflict, areas for potential cooperation, and recommendations for bridging the generational gap will also be discussed.

69 Occupational Therapy's Role in The Criminal Justice System: A Scoping Review

Justin McTish, Gesina Phillips, M.A., M.L.I.S., Joelle Ruggeri, Abigail Catalano, OTD candidate
Senior | Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Jaime Munoz, Ph.D., OTR/L, FAOTA

ABSTRACT:

Occupational therapy in forensic settings is a growing field in the occupational therapy practice arena. While there is limited evidence regarding the effectiveness of occupational therapy in the forensic setting, the literature available suggests occupational therapists have potential to help in the rehabilitation process of this population. Our purpose of this scoping review study was to provide a descriptive analysis of current occupational therapy literature by examining occupational therapy roles and practices within the criminal justice system in order to support the growth of occupational therapy practice with this growing but underserved population. We searched 8 data bases, reviewed reference lists of all selected articles, and searched grey literature sources through examining textbooks or chapters in textbooks, specifically examining OT practice in criminal justice settings using an established scoping review protocol. Our review criteria was broad and inclusive in order to obtain all applicable literature to our topic and create a comprehensive descriptive review. Conference proceedings from before 2012 as well as trade publications, thesis/dissertations, and editorials were all excluded. All articles from peer-reviewed occupational therapy journals were included in this review. The research team used Covidence software to organize and go through the inclusion/exclusion process. Three team members voted to include/exclude a source, and a third party researcher resolved any voting conflicts. Literature found on occupational therapy in forensic settings dates from 1986-2016. At this point, the scoping review has identified nearly 100 sources for analysis. Analysis will continue for the next few months but preliminary analyses allow us to organize the available literature in specific descriptive categories.

70 Effects of service learning in cognitive, pro-social and identity development

Meron Metaferia

Sophomore | Biochemistry | Bayer School of Natural and Environmental Sciences
Faculty Advisor: J. Lamar Foster

ABSTRACT:

In today's pluralistic and global society, multiple worldviews and salient cultural traditions have a lasting influence on how students think, feel, and relate to others. In such a world, many students struggle with self-identity and cognitive development. Higher education is one of the place where a student is immersed in a significantly diverse environment, where he/she grapple with different kind of identity and cognitive questions such as: who am I? How do I relate with others? Am I really passionate in the major I chose? and etc. Thus the current study investigated the effects of key characteristics of service learning on the cognitive, moral, and ego identity developments of undergraduates who participated in service learning courses. Control students, and past and current community engagement learning and research students at Duquesne filled out a survey. Results revealed significant gains for the service-

learning participants on certain cognitive dimensions, such as awareness of multidimensionality, reasoning, and identity processing and decision-making skills for the self-development characteristics.

71 Identification of Sulfur Oxidizing Bacteria in Wingfield Pines

Alanna Michalski

Senior | Biology | Bayer School of Natural and Environmental Sciences

Faculty Advisor: Nancy Trun, Ph.D.

ABSTRACT:

Abandoned coalmines can lead to contaminated drainage into rivers and streams that are used in agriculture, and as sources of drinking water. Wingfield Pines is the site of an abandoned coalmine in Bridgeville, Pennsylvania. A passive bioremediation system is being used to help remove contaminants from the water before it enters Chartiers Creek. The remediation system uses a scheme of 5 settling ponds and a constructed wetland. The entire system contains high levels of sulfur ranging from 272PPM to 323PPM, which is never remediated.

We are studying bacteria that influence sulfur levels by either oxidation or reduction reactions. We examined the sulfur oxidizing bacteria (SOBs) every 2 meters for a total 8 meters at two places in pond 1. By sequencing the V4 variable region in the 16s genes of the bacterial communities in these samples without culturing the samples, we determined the phyla and genus of all bacterial members present. By culturing the samples on SOB growth media, we have identified 16 independent sulfur oxidizing bacteria. We are determined their identity via cloning, and sequencing of the 16S-23S rrn intergenic region of their DNA. Our analyses will shed light on the role(s) that SOBs play in remediation of abandoned coalmine drainage.

72 Women in the Late Nineteenth Century: Involvement in the 1893 Chicago World's Fair

Maria Miller

Junior | History / Secondary Education | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Jotham Parsons, Ph.D.

ABSTRACT:

The Columbian Exposition of 1893, also known as the Chicago World's Fair, was a clear example of the women's rights movement in nineteenth century America. It exemplified the inclusion of women in male-dominated fields by establishing a Board of Lady Managers. This group of women held executive authorities over the establishment of a Woman's Building. The Woman's Building was a space dedicated to displaying the achievements of women throughout the world. This Building also gave female visitors hope for a future of expanded rights. Despite this, the Woman's Building isolated women's work into a distinct section within the Exposition. The Board of Lady Managers refused to allow women of diversity to be exhibited in the Women's Building, further separating women. Although many women's rights groups were established during this time, minimal progress was made because of racial, class, gender, and ideological divides in America. The 1893 Chicago's World's Fair was a step in the right direction in terms of women's progress, but it lacked complete gender equality.

73 Systematic Detection of Skip Grams in Computational Linguistics

Nicholas Pitoniak

Freshman | Computer Science | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Patrick Juola, Ph.D.

ABSTRACT:

In computational linguistics, the ability to detect and record skip-grams in a body of text is useful for a variety of analytics. For example, Arabic morphology relies heavily on discontinuous patterns of characters that can only be captured via such skip-grams. However, systematically detecting skip-grams is challenging because they are formatted as patterns of characters separated by an unknown number of unknown alphabetical characters. To systematically detect skip-grams, the Java programming language is utilized with the string analysis library RegEx. Systematic analysis and detection skip-grams in a body of text will likely be a strong indicator of authorship of text and a valuable resource for Duquesne University's computational linguistic efforts.

74 Synthesis and Analysis of Li₂SnS₃ for Potential Applications in Solid-State Lithium Ion Batteries

Shannon Moore, Jennifer Glenn, Dr. Jennifer Aitken

Sophomore | Forensic Science and Law | Bayer School of Natural and Environmental Sciences

Faculty Advisor: Jennifer Aitken, Ph.D.

ABSTRACT:

Organic liquid electrolytes pose serious safety issues; however, solid-state electrolytes used in solid-state lithium ion batteries are safer due to their environmental stability. The Li⁺ ion conductivity of Li₂SnS₃ makes it a promising solid-state electrolyte. Li₂SnS₃ is a wide-gap semiconductor with a sodium chloride-like structure. Initial Li⁺ ion conductivity data collected by impedance spectroscopy were obtained from pellets of 56% of the theoretical density; however, much higher conductivities are expected for pellets closer to the theoretical density. Therefore, it is necessary to develop a method for producing denser pellets, which first requires a phase-pure compound to be prepared. Over the summer and this spring, the preparation of Li₂SnS₃ was carried out via high-temperature solid-state synthesis. Phase purity was assessed using X-ray powder diffraction. Scanning electron microscopy was used to study the morphology of the crystals, and energy dispersive spectroscopy was used to determine a semi-quantitative elemental composition. UV/Vis/NIR spectroscopy was also carried out.

75 Baby Face: Exploring Developmental Trends in Cuteness and Beauty in Human Infants

Charli Muszynski

Senior | Psychology & Theater Arts | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Alexander Kranjec, Ph.D.

ABSTRACT:

Is there a period of peak attractiveness during infant development? Previous work in psychology has investigated the specific features that contribute to babies being perceived as "cute" (e.g., large eyes, chubby cheeks). According to several theories, such neotenous characteristics may serve to elicit helping behaviors in caregivers. Surprisingly, however, no study to date has explored the relationship between

age and perceived cuteness in human infants. The current research aims at identifying peak developmental periods of 'beautiful' and 'cute' characteristics in human babies between the ages of one week and twelve months. By asking participants to rate infants for both "cuteness" and 'beauty,' the study also explores any potential dissociations between these different kinds of judgments. Participants will rate a number of baby faces without knowledge of their age, for both cuteness and beauty. Analyses will examine both between and within-baby differences in average ratings across development. Observed patterns in cuteness and/or beauty may then be correlated with behavioral trends in development to determine if attractiveness peaks at ages that are typically more difficult for caretakers.

***76 Novel ERK5/MEK5 inhibitors in the treatment of triple negative breast cancer**

Victoria Nesbitt, Akshita Bhatt, Thomas Wright, Jane Cavanaugh, Patrick Flaherty
Senior | Pharmacy | Mylan School of Pharmacy
Faculty Advisor: Jane Cavanaugh, Ph.D.

ABSTRACT:

Breast cancer accounts for nearly 30% of all diagnosed cancers in women. As the most frequently diagnosed cancer in females, approximately 1 in 8 women who live to be 85 years of age will receive this diagnosis at some point in their lifetime. While a multitude of cellular pathways are involved in the development of cancer, aberrations in the Phosphoinositide-3-kinase (PI3K) and Mitogen Activated Protein Kinase (MAPK) pathways have been linked to increased breast cancer proliferation, metastasis, and survival. In particular, ERK5, as well as its upstream kinase, Mitogen activated kinase 5 (MEK5), play a critical role in mediation of oncogenes, cell survival, and cell differentiation, and is therefore a potential target for anticancer drugs. Using novel pharmacological inhibitors of the MEK5/ERK5 pathway, we have recently observed a role for the ERK5/MEK5 pathway in the epithelial-mesenchymal transition (EMT), a process involved in the initiation of metastasis. In addition to ERK5/MEK5, the phosphatidylinositol 3-kinase (PI3K)/Akt pathway is involved in cancer cell proliferation and survival and we have found that inhibition of both the MEK5/ERK5 and PI3K/Akt pathways is more effective than inhibiting one pathway at decreasing breast cancer cell proliferation. Currently, we are testing two novel MEK5/ERK5 inhibitors, SC-1-181 and SC-2-45, alone and in combination with MK-2206, an allosteric inhibitor of Akt, using the MTT assay and Western blot analysis to examine viability and kinase activity, respectively. The goal of our study is to elucidate the roles of the PI3k/Akt and MEK5/ERK5 pathways in triple negative breast cancer.

77 INTERVAL CRYOTHERAPY HAS A POSITIVE EFFECT ON OPEN KINETIC CHAIN ACTIVITIES IN ADULT MALES: A CRITICALLY APPRAISED TOPIC

Margaret Oberst, Julie Richards
Senior | Athletic Training | Rangos School of Health Sciences
Faculty Advisor: Jason Scibek, Ph.D., LAT, ATC

ABSTRACT:

Context: Cryotherapy is a current recovery method to relieve soreness and aid in performance. However, the intermittent cryotherapy effect on activity is currently unknown. Objective: To determine

the effect of interval cryotherapy on upper extremity open kinetic chain (OKC) activities in adult males. Data Sources: We utilized a PICO framework: Population: baseball pitchers AND throwing athletes; Intervention: cryotherapy OR cold therapy OR ice; Comparison: no intervention; Outcomes: performance OR velocity. Databases searched included PubMed, SportDiscus, Cochrane Library, CINAHL, and hand-searches. Study Selection: The three selected studies investigated the use of cryotherapy on the shoulder joint, followed by performance assessment. The inclusion criteria was investigations of level 2 evidence or higher, written in English, with human subjects, and within the last 16 years. Any articles involving subjects with poor physical health or injuries were excluded. Data Extraction: Data extracted from the articles included upper extremity OKC velocities with and without interval cryotherapy. Data Synthesis: Effect sizes for mean differences and confidence interval in OKC performance changes were calculated from study data. The effect sizes ranged from Cohen's $d = 0.29$ to 2.93 . While the effect size was small, the evidence within each study showed clinical significance. Conclusion: A Strength of Recommendation level of B exists that interval cryotherapy positively impacts performance during upper extremity OKC activities in adult males. Therefore, clinicians can consider implementing interval cryotherapy when attempting to increase performance during overhead athletic activities. Future research should consider the effects of interval cryotherapy on preventing upper extremity fatigue during rehabilitation.

78 Through the Lens of Children: Benefits of Bilingualism

Bethany Parsons

Sophomore | B.S. Biology & Pre-Medical Health Professions Program | Bayer School of Natural and Environmental Sciences

Faculty Advisor: Lucia Osa-Melero, Ph.D.

ABSTRACT:

Have you ever traveled to a foreign country and not been able to communicate? What about hearing a different language and not being unable to understand? Sadly, foreign language instruction is declining in United States' schools. Foreign language education and multilingualism are important not only for the betterment of one's self, but also for the advancement of society as a whole on multiple fronts.

This project examines the impact of bilingualism (specifically with Spanish & English languages) through the lens of children, and how it affects their cultural and societal understanding in the elementary years. Observations of student teaching children ages 4-8 and conversations/interviews with their parents were noted and common trends identified. These trends were then researched through a variety of databases. Overall, the pattern shows that the majority of responses from both children and parents perceive bilingualism as beneficial to the community and themselves. Specifically, most parents found bilingualism to be a key skill for education and career enhancement. Children, on the other hand, found it to be useful in interacting with peers, and socially engaging. The implications of this study highlight the positive contributions of teaching foreign languages in American society. This provides a platform for advocacy for foreign languages and global diversity to the next generation.

79 *Establishing Aesthetic Versus Affective Norms for English Words

Cheyenne Thompson, Jenna Pelly

Senior | Psychology | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Alexander Kranjec, Ph.D.

ABSTRACT:

The Affective Norms for English Words (ANEW) database was developed to provide a set of emotional ratings for a large set of 1,038 English words for researchers who study emotion (Bradley & Lang, 1999). The emotional valence of a word can provide a basic quantitative measure of word meaning, that is, a measurement of the “goodness” or “badness” of verbalized concepts. Word valence has also been used to investigate the aesthetics of poetic language. Prior research from our lab explored the extent that word valence and word beauty can be dissociated in a rating task. For example, melancholy has an unhappy meaning, and a negative valence, but the sound of the word may be considered relatively beautiful. Using the same words from the published ANEW database, participants in the current study will be asked to rate selected words in order to establish distinct norms for individual word valence and beauty for all 1,038 words. They will be asked to rate the valence of words on a 9-point scale ranging from unhappy to happy, and the beauty of words on a 9-point scale ranging from ugly to beautiful. Distinct normative rating data for the basic meanings and aesthetics of words can then be used to investigate the how both variables affect the interpretation and appreciation for texts of various kinds.

80 *Effects of Vestibular and Ocular Assessment Tools in Diagnosing A Sports-Related Concussion: A Critically Appraised Topic*

Cassidy Powers, Amanda Nosker

Junior | Athletic training | Rangos School of Health Sciences

Faculty Advisor: Erica Beidler, Ph.D.

ABSTRACT:

Clinical Scenario: The average sport-related concussion (SRC) injury rate for high school and collegiate athletes is 26.1 SRC per 100,000 athlete-exposures. A wide range of symptoms are provoked from sustaining a SRC; more recently vestibular and ocular problems have been reported in 30-50% of concussed athletes. Due to this, it is imperative that the vestibular and ocular systems are assessed for dysfunction following a concussive injury. Clinical Question: Do vestibular and ocular assessments demonstrate a high internal consistency and sensitivity when diagnosing athletes with SRCs? Summary of Key Findings: The literature was searched for studies that investigated vestibular and ocular assessments and their internal consistency and sensitivity for diagnosing a SRC. There were 5 studies that met the inclusion criteria; 4 of which stated a high internal consistency ranging from 0.92-0.97 and 3 studies reported a high sensitivity. Clinical Bottom Line: There is moderate evidence to suggest that dizziness, balance, and visual problems should be assessed on the sideline or in the clinical setting by using vestibular and ocular assessment tools. Vestibular and ocular assessment tools have shown high internal consistency and sensitivity.³ Athletic trainers involved in the acute clinical evaluation of SRCs should consider using a vestibular and ocular assessment tools in order to provide the highest level of

care possible. Strength of Recommendation: Grade B Keywords: Concussion assessment, vestibular and ocular function, convergence

81 Factors Influencing Economic, Psychosocial, and Geographical Mobility in the Hill District

Manasa Reddy, Kaitlyn Abrams, Jenna Pelly, Zuzanna Stelmaszak, Jennifer Rauch, Nupur Charyalu
Senior | Psychology | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Susan Goldberg, Ph.D.

ABSTRACT:

This poster will present the findings of a qualitative research study that was also part of Dr. Goldberg's Psychology and Community Engagement class. The study investigated the way people experience living in the Hill District of Pittsburgh.

The Hill District is home to a collection of predominantly African-American neighborhoods. This area of Pittsburgh, Pennsylvania has a rich and varied history. In 1804, the Hill District was called "Little Haiti" following the rebellion in Haiti by slaves that gained independence in 1804. From 1907-1966, the Hill District was a catalyst for the Pittsburgh Courier, a black newspaper that would eventually circulate throughout the United States detailing the Civil Rights Movement. The Hill District became a major center for jazz music and was, at one time, called by many "the crossroads of the world" for its diverse population. Unfortunately, urban renewal in the 1950s, the riots in the 1960s and, recently, gentrification have impacted the economic, psychosocial and geographic mobility of members of the Hill District.

In order to better understand the impact of infrastructural and cultural transitions on the experiences of residents, our team conducted a series of qualitative interviews with members of the Hill, working with FOCUS Pittsburgh, a community center based in the Hill District. Participants described their experiences living in the Hill and how they made meaning in lives that often experienced community trauma. We will discuss findings from interviews addressing one aspect of the research: when and how people experience the three types of mobility.

82 Lived Experiences of Hijab-wearing Muslim Women in the United States

Jenna Pelly, Elizabeth Bennett, Ph.D. Candidate
Senior | Psychology | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Lori Koelsch, Ph.D.

ABSTRACT:

This poster will present the research of undergraduate student Jenna Pelly and graduate student Elizabeth Bennett on hijab-wearing Muslim women in the United States. There are about 3.3 million Muslims living in the United States today (which is about 1% of the U.S. population) and this number is expected to increase up to 8.1 million (about 2.1% of the U.S. population) by the year 2050.

Misunderstanding between the Muslim and American understanding of the hijab has contributed to cultural dissonance. Islamophobia is prevalent in the United States, particularly in our current cultural and political climate, and this phenomenon may have a substantive impact on Muslim women, both in

how they live in our culture as well as how they perceive themselves. For example, the stigma of Muslim women in the U. S. can be linked to stress, the availability of resources, social relationships, and psychological and behavioral responses. By asking about the lived experience of Muslim women, we hope to be able to increase awareness about how our actions impact them and learn what we can do to work toward more mutual understanding.

This qualitative exploratory study utilizes interviews and a qualitative, feminist method of analysis to attempt to more deeply understand the Muslim experience. Recruitment was conducted through the use of flyers placed around Pittsburgh. Participation is limited to women who wear the hijab at least 50% of the time.

83 Analysis of Common Practices in Automated Stylometry

Derek Prijatelj, Daniel Watson

Junior | Computer Science | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Patrick Juola, Ph.D.

ABSTRACT:

Stylometry is the study of linguistic style to attribute a written work to its author. It has important applications in law, journalism, and scholarly research. The significance of stylometry in these fields naturally demands reliability and statistical validity. In our research, we explore common methods of automated stylometry and discuss the use of ensemble methods for document classification. Ensemble methods are generally more reliable than using any single technique, but assembling an ensemble intelligently is no trivial task. Our method involves taking both individual performance and statistical behavior between methods into account to estimate a given ensemble's performance on a dataset. This is done by considering each method's results on a training set as a sample from a random multivariate binary distribution which can be modeled and then sampled to give an approximation of overall accuracy. For comparison, we examine the naive approach, where an ensemble chosen from the analysis methods with the best individual performance and compare this our results. To compare the separate approaches, we utilized a corpus of English science fiction novels, and applied the two ensemble construction approaches to find the best ensemble of linguistic analysis methods for author attribution.

84 The Healing Influence of Art

Claire Priore

Sophomore | Early Childhood Education | School of Education

Faculty Advisor: Patricia Sheahan, Ph.D.

ABSTRACT:

While childhood is often viewed as a time of innocence and discovery, many do not realize a significant number of young children suffer pain, grief, and trauma due to deaths in their family. One out of twenty

children under fifteen years of age will lose one or both of their parents, and one in five children by age eighteen will experience the death of someone close to them. The implication of this is not only detrimental to the health and wellbeing of the youth of America, but negatively impacts other areas of their lives especially in the school setting both socially and academically. The ways in which children can communicate their feelings is often limited or unknown to both them and the adults around them. This research illustrates the difficulty students face when they lose a loved one, as well as the positive influence art and creative expression has for children experiencing grief. The use of creative arts therapy is an approach used by many pediatric professionals to safely encourage a way for children to communicate their feelings and emotions after the death of a family member. It provides a healing process that requires no verbal pressures or judgements. This project extends the research on art therapy for grieving children by making suggestions as to how educators can incorporate creative expression opportunities into their classrooms to further support students who are experiencing trauma in their lives.

85 *The Effect of a Visual Communication Partner and Age on Gesture Use, with a Focus on Beat Gestures*

Clare Rahill

Junior | Speech-Language Pathology | Rangos School of Health Sciences

Faculty Advisor: Heather Rusiewicz, Ph.D., CCC-SLP

ABSTRACT:

Gestures are important for enhancing a message from a speaker to a listener. However, empirical investigation regarding the development of gestures or the reason we as human beings gesture is relatively new. This exploratory study focused on potential differences in the type and frequencies of gestures, with a focus on rhythmic beat gestures, as both a function of age and visualization of the listener. It was predicted that beat gestures would increase with age and the ratio of beat gestures to other gestures would be greater when speaker cannot visualize the listener, due to the hypothesis that adults use beat gestures to mark their own rhythm and emphasis, and not for the immediate benefit of the listener.

Four neurotypical males (at ages 3, 9, 10, and 21) completed a video narration task with two short animated films and engaged in two brief conversations with the examiner. The presence or absence of a screen to block the view of the listener was counterbalanced across tasks and participants. The type and frequency of gestures, and the ratio of gestures to communication units, and the ratio of beat gestures to all other gestures were analyzed.

Preliminary results suggest a positive correlation between age and frequency of gesture use, as well as age and proportion of beat gestures. Additionally, analyses indicate that all subjects use a higher proportion of beat gestures when the listener is not in view, with a more significant difference for adults across conditions.

86 Geometry -vs- Intensity in Image Denoising

Donovan Ramsey, Brady Sheehan

Senior | Computer Science | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Stacey Levine, Ph.D.

ABSTRACT:

Recent studies suggest that various denoising methods can be improved upon by denoising some geometric feature of a noisy image instead of processing the image directly. We have observed that while the object boundaries within an image always benefit from this approach, smooth regions do not always enjoy the same benefits. In this research we are currently exploring mechanisms within this framework for treating smooth areas and edge regions differently to generate an optimal reconstruction across the entire image.

87 Spatial and Temporal Estimations for Familiar Objects and Events

Jennifer Rauch

Senior | Psychology | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Alexander Kranjec, Ph.D.

ABSTRACT:

How do we perceive and experience intangible things such as “time”? In the English language, we often talk about temporal events using spatial language, such as length (E.g., This class is so long!). The fact that we often use space to think about time suggests it may be easier to think about spatial knowledge as compared to temporal knowledge. The current study builds off a previous study from our lab investigating people’s accuracy at estimating the extent of objects in space (i.e. their size) versus events in time (i.e., their duration). Using an online survey, participants will be asked to estimate the duration of common events (in seconds, minutes, or hours) and the length or height of objects (using inches, feet, or miles). Events and objects will be selected based on their familiarity in daily life (e.g., the length of a pen, or the time it takes for water to boil). Actual or approximate/average measurements of the events and objects will be compared to participants’ responses. Based on previous results, we predict that judgments in the more concrete domain of space will be more accurate, and that estimations will vary depending on the magnitude of the object or event. That is, despite spatial approximations being more accurate overall, we predict the error will be proportional for both larger objects and longer events because larger objects and longer events are each more experientially abstract.

88 Does music therapy play a role in cognition and physiology of those diagnosed with dementia?

Rachael Reiner

Sophomore | Music Therapy | Mary Pappert School of Music

Faculty Advisor: Elizabeth Bennett, M.A.

ABSTRACT:

Does music play a role in the cognitive abilities of those diagnosed with Alzheimer’s/Dementia? Studies have found that music effects physiological and cognitive functions in most people, but especially those with Alzheimer’s/Dementia. In this study, 8 patients (4 males and 4 females) in ages ranging from 65-75

years were evaluated on their cognitive functioning and physiological attributes following a twice-weekly music therapy session that lasted 60 minutes. A control group consisted of 8 patients (4 males and 4 females) which did not receive music therapy, but had a different twice-weekly activity such as bingo or a movie. There were two music therapists; one who performed the music, and one who observed/collected data. Before the music therapy sessions began, the patients were asked to identify their favorite songs or genre of music. The favorite music was incorporated into the session. Following the music therapy session or bingo for the control group, the patients were asked to take a brief survey (MOCA) which tested their cognitive and psychological functioning. A saliva sample was taken from participants to test physiological reactions in cortisol levels which shows an indication for the stress levels. It was found that the patients who had received music therapy were better able to answer the questions on the test and had lower cortisol levels when compared to the control group that did not receive music therapy.

89 SERINE PHOSPHORYLATION IS INVOLVED IN LPS-DEPENDENT ACTIVATION OF THE SPI-1 TRANSCRIPTION FACTOR

Tiffany Ricketts, David Kosko, Sree Pulugulla

Junior | Biochemistry | Bayer School of Natural and Environmental Sciences

Faculty Advisor: Philip Auron, Ph.D.

ABSTRACT:

Interleukin 1 β (IL-1 β) is a macrophage-activated cytokine that acts as an important facilitator of inflammatory responses in infection or injury. Expressions of IL-1 β causes inflammation and fever, which in short transient bursts can be therapeutic, however, sustained expressions can be associated with auto-inflammatory diseases. Spi-1 is a monocytic cell lineage-determining factor that is required for IL-1 β gene expression in macrophages.

We hypothesized that LPS-dependent serine phosphorylation in the PEST domain of Spi-1 could lead to relaxation of Spi-1 auto-inhibition, resulting in the amino-terminal transactivation domain (TAD) becoming available for the recruitment of TATA binding protein (TBP) to IL1B promoter.

Plasmid vectors for wild type, mutations and deletions of the Spi-1 domains were isolated from *Escherichia coli* cultures. The plasmid DNA isolates were verified using restriction enzyme digestion and gel electrophoresis. Plasmid DNA coding for TRAF6, IRF8, Spi-1 mutants and IL1B gene luciferase reporters were transfected into iM Φ model macrophage cells and IL1B gene activity was measured using Luciferase assay.

Serine to alanine mutations in both the TAD and the regulatory PEST domains of Spi-1 showed a significant decrease (about 60%) in IL1B gene activity as compared to Wild-type Spi-1. Endogenous IL1B mRNA analysis using q-PCR in the iM Φ model macrophage cell line transfected with same factors supported the luciferase assay results.

These studies show that LPS-dependent serine phosphorylation of Spi-1 plays a role in the recruitment of TBP to IL1B promoter. These studies can help in identifying druggable targets that can inhibit LPS-dependent Spi-1 phosphorylation, resulting in decreased IL1B expression.

90 *We Are All Singing The Same Song: The Influences of Protest Music and Woodstock*

Tara Ritz

Senior | History and International Relations | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Dr. Matthew Hyland

ABSTRACT:

Protest music in the 1960's and 1970's defined the political and cultural upheaval of a generation, which led to a significant change in American music. Artists like Jimi Hendrix, Country Joe MacDonald, Richie Havens, Crosby Stills and Nash, made the discontent with the Vietnam War and civil rights to popular culture. Woodstock Music Festival was the culmination of the protest movement proving that music could be used as a political catalyst. Woodstock proved to people around the world that this festival was more than hippies laying in a field listening to music. The festival showed the political power music had and became a transformative event for American culture. Woodstock shaped the way that music was written, heard and performed, changing music to be politically and culturally aware. In this essay I analyze how the protest music of Woodstock pushed the limits of the time, summarized the discontent with American society and opened up the world to politically expressive music. The new, politically motivated, experimental music of the 60's and 70's allowed for future generations to express their struggles through new rap and rock music. During the 1990's groups like N.W.A and Rage Against the Machine told stories of police brutality in African American communities, and political corruption through explicit and attention grabbing songs. The music of Woodstock changed the way Americans listened and performed music, allowing the world to express political opinions and struggles through experimental music.

91 *Vocational Aspirations of Inner City School Girls*

Julie Rothberg, Octavia Anderson and Bria Brodie

Senior | Nursing | School of Nursing

Faculty Advisors: Cathleen J. Appelt, PhD; Andrew T. Simpson, PhD; and Jessica Devido, PhD

ABSTRACT:

Historically, African-American women have been underrepresented in health care professions. Therefore, the aim of this study was to explore health career aspirations of female students in inner city Pittsburgh, Pennsylvania schools in order to gain insight into the types of careers this population is interested in. Two brief surveys were administered to 25 inner city girls ages 12 to 19. In the first questionnaire, students were asked to respond to questions about their desire to continue their education beyond high school and about their potential interest in pursuing a career in a health-related profession. Socio-demographic information, including students' age, grade level, and race/ethnicity were collected via a second questionnaire. Frequencies and other descriptive statistics from both questionnaires were generated using SPSS, Version 24.0. Of the 25 students surveyed, 18 (82%) identified themselves as African-American, 1 (4.5%) Hispanic and 3 (13.5%) selected "Other" identifying as both "Black and White." The students filled out a 22-question survey with 9 questions specific to vocational aspirations. Twenty-three students (92%) wanted to have a career one day and 19 students (76%) wanted further education beyond high school. Remarkably, 14 students (56%) showed at least

moderate interest in becoming nurse and 13 students (68%) indicated at least a moderate level of interest in a health-related career. These results suggest that although there is an underrepresentation of African-American females in the healthcare field, this may not be due to a lack of interest in health-related occupations. Therefore, educational opportunities could be beneficial.

92 *The Effectiveness of Enhanced Interrogation Techniques following 9/11*

Leyla Salehzadeh

Senior | International Relations | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: John Le Beau, Ph.D.

ABSTRACT:

In the aftermath of the September 11th attacks, many national security issues were brought to light with renewed importance as the world reacted with horror to the events that had transpired. Among these issues was the implementation of an enhanced interrogation program which was signed into law by President Bush via an executive order mere days after 9/11. This program issued a broad range of powers to the CIA for capturing suspected Al-Qaeda terrorists and interrogating them. Although no longer in use, it is still the source of a great deal of controversy, due to the legal and moral grey area in which it existed and questions of overall effectiveness. Many have even gone so far as to equate the techniques used to torture. The CIA maintains to this day that the program was extremely effective in preventing future terror attacks from taking place and helping find the mastermind of 9/11, Osama Bin Laden; however, a Senate Intelligence report released in 2014 disputes many of the claims made by the CIA. Setting aside the issue of ethicality, the real question is whether enhanced interrogation techniques are useful in providing actionable intelligence, and more specifically, were the sometimes extreme methods of interrogation used by interrogators worth the intelligence that was gathered post 9/11.

93 *Towards A Bacteria Retardant Implant Surface*

Autumn Schultz, Nina A. Reger

Junior | Chemistry | Bayer School of Natural and Environmental Sciences

Faculty Advisor: Ellen Gawalt, Ph.D.

ABSTRACT:

Titanium aluminum vanadium is a common implant material due to its corrosion-resistance, lightweight and biocompatibility. Bacterial colonization may occur upon or shortly after implantation, ultimately forming a biofilm. Biofilms are communities of sessile bacteria that adhere to surfaces possibly causing a difficult to treat infection, but preventative measures can be taken. Low concentrations of nitric oxide have been shown to disperse bacteria from biofilms. Modification of the implant to release nitric oxide has the potential to decrease biofilm formation in conjunction with antibiotics. N-diazeniumdiolates (NONOates) release two moles of nitric oxide per molecule at physiological conditions. Self-assembled monolayers with a carboxylic tail group were used as linkers to immobilize diethylene triamine N-diazeniumdiolates (DETA NONOate) using a carbodiimide reaction. Diffuse reflectance infrared Fourier transform spectroscopy (DRIFT) was used to characterize the monolayer and to confirm attachment. Attachment was confirmed by the presence of amide I and amide II stretches. The effectiveness of the NO released will be tested against *S. Epi*.

94 Student Wellbeing while Studying Abroad: A Pilot Study

Sarah Schech

Senior | Psychology | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Teal Fitzpatrick, Ph.D.

ABSTRACT:

There is a large body of research which evaluates the positives and negatives of studying abroad. While students may become more open minded and more globally aware, many students often experience isolation and depression like symptoms. This study will look at the well-being of students as they study abroad, particularly focusing on feelings of isolation and depression. Students who study abroad with other students from the same home university will be compared to students who study abroad without students from the same home university.

95 A Study Proposal on Parent-Child Relationships Post-Divorce

Jessica Semick

Freshman | Psychology and Political Science | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Elizabeth Bennett, M.A.

ABSTRACT:

We as a society often wonder how children from divorced families will cope. Whether it be from the shock of the divorce, the feeling of abandonment from a parent not being there as much, or feelings of guilt over being a cause of the parents' divorce, it is often assumed that divorced families take their children to therapy in order to help relieve some of the pressures of living in a newly divorced family. Recently, several studies have emerged attempting to measure the effectiveness of family therapy with children coming from divorced families. They measure everything from parents' willingness to participate, to the development of the child, to the function of the family after the divorce is finalized. But one area of these therapies that is currently understudied is the effect that forced therapy might have on children. This proposed study will examine a total of 30 children and adolescents between the ages of 7 and 17 from divorced families in the United States; assent will be obtained from parents. Fifteen of these children and/or adolescents will come from divorced families who have put their children into therapy against the child's wishes and the other fifteen will either not be receiving therapy or will be going to therapy by choice. This study will attempt to measure the differences between the relationships that children have with their parents if they are forced into therapy versus not being forced into therapy, as well as several other psychosocial characteristics of the child or adolescent's development. This project will also include a comprehensive analysis of the studies that already exist pertaining to children and adolescents coming from divorced families and family therapy.

Keywords: child therapy, divorce, consent to therapy

96 Measurement of the Proton Radius at The Paul Scherrer Institute (PSI)

Adam Sneath

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Faculty Advisor: Fatiha Benmokhtar, Ph.D.

ABSTRACT:

Determining an accurate charge radius measurement for the proton is eluding the experimental physics community; its pursuit has been deemed the Proton Radius Puzzle. The radius measurement is sought through scattering experiments, at particle accelerators, in which the proton is modeled as a positively charged sphere. Three methods: electron-proton (ep) scattering, atomic hydrogen level transitions and muon-proton (μp) scattering, have each measured the radius differently. Muon-proton scattering experiments have produced results with relatively small uncertainties, compared with the other methods. Yet there is more independent data for ep scattering, and its results are less controversial with theoretical explanations.

Consequently there is a great need for more data analysis to determine whether the ep and μp scattering measurements of proton radius are intrinsically the same, or different. If they are the same that is to say they vary only with experimental uncertainty. If different, then theoretical physics will need new explanations for each measurement. To minimize the effect of uncertainty, this experiment simultaneously measures ep and μp scattering, along with their corresponding anti-particle beams. I will travel to PSI this summer and participate in data taking, then return to Duquesne for offline analysis with Dr. Benmokhtar. The solution to the Puzzle rests in the data, as clear, definitive data will inspire logical theoretical proofs. The proper solution and ensuing theory will gather widespread attention, and potentially advance the field of particle physics into currently unknown realms.

97 Polyamory and the work-life experience: A mixed-methods phenomenology

Emily Shemanski

Senior | Psychology | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Elizabeth Bennett, M.A.

ABSTRACT:

The purpose of this research is to examine the challenges and experiences of polyamorous people in the workplace. While there has been much progress made in anti-discrimination policies in the workplace for gender, race, and sexual orientation, there exists no protected status for polyamorous people; therefore they may face additional stressors, ranging from fear of being “outed” to the risk of losing one’s job or being denied fair family accommodations. There are between 1.2 million and 9.8 million polyamorous people living in the United States, and most polyamorous people live “in the closet,” keeping their romantic preferences secret from family and friends out of fear of judgment, misunderstanding, or retaliation. In addition, intimacy with multiple partners is often associated with infidelity, which is socially and culturally frowned upon in the United States. After a thorough literature review, we identified a substantive gap in the work-life literature investigating the challenges and experiences of polyamorous people in the workplace. Given the complex experience of identifying as polyamorous in the United States, including myriad opportunities for stigma and workplace challenge,

we hope to explore this phenomenon in more depth than currently exists in the relatively scant literature in this area. The present study utilizes a mixed-methods approach. The first phase of the project involves a brief survey to examine stress, perceived self-efficacy, and basic demographic information. The second phase utilizes one-hour narrative interviews with 7 participants to explore participants' work-life experiences, rooted in an exploratory, phenomenological approach.

98 Development of a sampling method for studying the interaction of antibody with hydrogel

Amy Spigelmyer

Senior | Pharmacy | Mylan School of Pharmacy

Faculty Advisor: Wilson Meng, Ph.D.

ABSTRACT:

The purpose of this research is to devise a new method for monitoring release of antibody drugs encapsulated in hydrogels. Conventional drug release apparatuses are impractical for small volume samples below 1 ml. We tested a system in which the extent of IgG molecules entrapped and released from hydrogels made with the self-assembling peptide EAK16-II can be determined. The setup consists of a 1-ml syringe fitted with a 0.22-micron filter of low-protein binding capacity. Test samples containing a mixture of less than 50 microliters IgG labeled with the fluorescent dye fluorescein and EAK16-II peptides were compared to control samples in which EAK-II peptides were not added. After incubation at 37°C and placement of samples within respective syringes, 500 microliters of buffered saline containing 0.1% bovine serum albumin were added to each syringe as release medium. Sampling were done by withdrawing 100 microliters of the medium from the syringe and analyzed for presence of the IgG corresponding to fluorescein excitation and emission wavelengths. The volume of release medium that was removed was then replaced with fresh medium. In future experiments, a standard curve relating the intensities of fluorescence and concentrations of IgG will be established. In addition, IgG concentrations will be measured using SDS-PAGE. Results showed that this system should be further evaluated for monitoring loading and release of biological drugs. Factors to consider in validating the method for systematic drug release studies include limit of detection, limit of quantitation, sensitivity, and specificity.

99 Geometry in Patch Based Non-Local Denoising Algorithms

Brady Sheehan, Donovan Ramsey

Senior | Mathematics and Computer Science | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Stacey Levine, Ph.D.

ABSTRACT:

Techniques for denoising natural images have seen incredible advances over the past several decades, with the current state of the art using non-local patch based algorithms. Recent studies of denoising techniques have shown that we are not likely to do much better than the current state of the art when using image data alone. One way to improve image quality is to incorporate image geometry into the denoising algorithm. We present empirical evidence suggesting that properly incorporating geometry within these non-local algorithms shows great potential for improving the current state of the art

nonlocal denoising algorithms.

100 *The Effect of ADHD and Learning Disabilities on Neurocognitive Baseline Testing in High School Student-Athletes: A Critically Appraised Topic

Morgan Starczewski, James Daniel

Junior | Athletic Training | Rangos School of Health Sciences

Faculty Advisor: Erica Beidler, Ph.D.

ABSTRACT:

Clinical Scenario: Sport-related concussion (SRC) is a significant health concern for high school student-athletes, especially those who have been diagnosed with attention deficit-spectrum disorder (ADHD), a chronic condition marked by hyperactivity, inattention, impulsivity, and/or a learning disability (LD). Computerized neurocognitive baseline testing using the Immediate Post-Concussion Assessment and Cognitive Test (ImPACT) is a popular technique used to identify post-injury neurocognitive deficits, but the utility of these baseline tests for concussed athletes with ADHD/LD has not been definitively outlined. Clinical Question: Are there differences in SRC neurocognitive baseline test performance (verbal memory, visual memory, visual motor, reaction time) between high school student-athletes with and without a history of ADHD/LD? Summary of Key Findings: Through an exhaustive literature search, four articles were found that analyzed the baseline test performance in high school student-athletes with ADHD/LD compared to those without these disorders. All four studies showed that high school student-athletes that had ADHD/LD performed significantly worse on the ImPACT test compared to high school athletes that did not have ADHD/LD. Clinical Bottom Line: Sports medicine clinicians managing concussed athletes with ADHD/LD should be aware of the predispositions of scoring lower on neurocognitive baseline tests. When determining return to play, these athletes that are predispositioned to score lower at baseline run the risk of being returned faster than is warranted due to these skewed test scores. It is best to compare baseline test to the same person due to some athlete's inability to reach normative data. Keywords: ADHD, Learning Disability, Sports-related concussion, ImPACT.

101 *A Rhetorical Analysis of Local versus National Governments*

Jessica Semick

Freshman | Psychology and Political Science | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Kathleen Roberts, Ph.D.

ABSTRACT:

As a society in the United States, we tend to place a higher value on our national government than our local and state governments, meaning we are better informed of and care more about the national government than government at the state and local level. There are several different reasons why this may be. The United States national government and its activities and scandals tend to be more publicized than those of our local and state governments, and it is unsurprising that events more open to public opinion and scrutiny would gain more of a following, even though local government is closer to us as individuals and can impact us more directly. Another reason, however, is the impact of speeches

and statements made by local versus national government officials. We picture local government to be boring and nonessential, while national government is interesting and makes people want to pay attention. In this presentation, I intend to analyze two pieces of rhetoric: one made by a local government official and one made by a national government official to show just how the factors of human interest and public opinion play into “caring” more about one type of government versus the other. I will be using rhetorical analysis to show how each uses ethos, pathos, and logos to catch the public’s attention and inform them about the issues at hand. It is important to point out these differences at the rhetorical level to show how people are affected and react to them.

102 *A Face by any Other Name: Investigating the Effects of Individual Names on Facial Attractiveness*

Zuzanna Stelmaszak

Senior | Psychology | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Alexander Kranjec, Ph.D.

ABSTRACT:

In *Romeo and Juliet*, Shakespeare wrote, “A rose by any other name would smell as sweet.” The current study investigates how a person’s name may modulate peoples’ judgments about their facial attractiveness. Common first and last names from seven countries (USA, France, Italy, Norway, Mexico, Saudi Arabia, and Russia) will be rated for their stand-alone attractiveness (i.e., “How much do you like this name?”) Male and females faces from The Chicago Face Database, a publicly available database with hundreds of face stimuli rigorously normed for attractiveness will then be paired with each name. New participants will then rate name-face pairs for facial attractiveness in order to observe how names (of different levels of attractiveness) modulate attractiveness ratings for faces (of different levels of attractiveness). Names are hypothesized to affect attractiveness ratings. Different kinds of names, and the cultural stereotypes associated with them, may affect face ratings for participants.

103 *Pagan Origins of the Cross*

Robyn Tomaszewski

Senior | Nursing | School of Nursing

Faculty Advisor: Kathleen Roberts, Ph.D.

ABSTRACT:

Arguably the most significant and distinguishing symbol of Christianity is the cross. Followers of the most popular modern faith venerate and replicate this image constantly. While most Christians do not question where this symbol came from (as it is told that Jesus was crucified on a cross), there is rather a complex history surrounding pagan beginnings of this symbol. This paper explores the origin and adoption of this symbol in the early AD centuries. Scholars argue that the cross is not uniquely Christian, nor was Jesus crucified on something resembling it. The Greek of the New Testament never spoke of a cross, but used the terms “stauros,” and “stauroo,” meaning post or stake. They hypothesize that rather it was the Babylonians who adopted the symbol from their sun-god Tammuz and was later supported by Constantine merger of Christianity in communion with his practices and belief in sun-worshipping. The evidence surrounding the origin of cross calls into question the assumptions that the cross has today on

modern Christian worship. This paper assesses early interpretation and significance of the cross during the growth and spread of Christianity, as well as its implications on the rituals of the faith that many practice. Based on research and analysis, the paper concludes that the history and origin of the cross is something more complex than the common acceptance as Jesus' death medium. While it does not affirm an answer, it presents evidence and encourages critical thinking for the reader to make their own decisions.

104 Comparing NASA of the 1950s and 1960s to American Expansionism of the Nineteenth Century

Lydia Strickling

Junior | History | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Andrew Simpson, Ph.D.

ABSTRACT:

Historians, scientists, and politicians have frequently made associations between westward territorial expansion of the nineteenth century and the initial development of the space program, from NASA's founding in 1958 to the Apollo 11 moon landing in 1969, for the ways they captured the America's collective imagination and defined Americans as pioneers. Despite these recurrent comparisons, westward expansion and the early space program were not as alike as they have been traditionally promoted by notable figures, like John F. Kennedy. While both historical movements involved the notion of an identity shaping "frontier" and included overcoming natural boundaries, they share more significant differences than similarities. This paper, while acknowledging the commonalities between westward territorial migration and the early days of the American space program, will emphasize these events' more noteworthy disparities. These were the Federal government's role in each movement as well as the element of competition with a foreign nation, the Soviet Union, that was a central characteristic of NASA's earliest days but was absent in westward territorial expansion. To close, this paper will report on the current state of U.S. space efforts as well as argue that today's "pioneers" are computer scientists and that computing technology is the contemporary phenomenon that captivates America's collective imagination and attention in the tradition of the early space program and westward migration.

***105 Knowledge and perceptions regarding human immunodeficiency virus and in-home testing among a regional sample of student pharmacists**

Alvina Tran, Gregory Caspero, Andrew Mullin

Senior | Pharmacy | Mylan School of Pharmacy

Faculty Advisors: Jordan Covvey, PharmD, Ph.D., BCPS, Autumn L Stewart, PharmD, BCACP

ABSTRACT:

Objective: To assess student pharmacists' knowledge and perceptions of human immunodeficiency virus (HIV) and the use of an in-home, over-the-counter HIV testing device

Methods: Cross-sectional survey questionnaire delivered electronically using Qualtrics® (Provo, UT) to student pharmacists attending six regional schools of pharmacy, who were contacted using school/organizational listservs. The questionnaire consisted of 40 closed-ended, fixed-choice items

assessing respondent characteristics, perceptions of knowledge/comfort regarding HIV, and formal assessments of knowledge regarding the OraQuick® in-home HIV test. Survey offers were emailed in a single distribution during March-April 2016 with a reminder sent 2 weeks after the initial email. The study was approved by the Duquesne University Institutional Review Board.

Results: Among 324 students with at least 1-3 hours of HIV curricular contact hours completed, only 152 (46.9%) reported feeling knowledgeable on indications for HIV screening. 80.9% of respondents indicated feeling knowledgeable regarding modes of HIV transmission; however, 22% of this group incorrectly identified kissing as a potential mode of transmission. Only 63.6% of responders report feeling comfortable in the presence of a patient with known HIV infection. Only 16.1% of responders indicated feeling comfortable counseling on the use of the in-home test and 9% indicated confidence in this task.

Conclusion: Assessment of student pharmacist knowledge regarding HIV and the use of in-home HIV tests indicates opportunities to improve knowledge gaps. These findings are consistent with previous studies on pharmacists' knowledge and perception in counseling patients with HIV. Interventions to improve HIV education and use of screening products should be investigated and implemented.

106 Regulation of steroid sulfatase by glucocorticoids in NIH-3T3 mouse fibroblasts.

Paige Urbano, Christina Bennett

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Faculty Advisor: Kyle Selcer, Ph.D.

ABSTRACT:

Steroid hormones travel in blood as inactive sulfated forms. These sulfated steroids can be converted to active hormones in local tissues by the enzyme steroid sulfatase (STS). Our lab has previously shown that STS is active in liver and bone and that it is in part regulated by glucocorticoids. Currently, we are investigating if STS is regulated in mouse NIH-3T3 fibroblasts by a similar mechanism. Fibroblasts are common and widely distributed in the human body. Therefore, STS regulation in these cells could have major effects on overall estrogen production. Using a 3H-E1S conversion assay, STS activity was found to be present at high levels in NIH-3T3 cell homogenates and in microsomal and cytosol fractions of these cells. STS activity in fibroblasts was blocked by the known inhibitors EMATE and STX-64, indicating the presence of authentic STS. STS activity was significantly decreased by the glucocorticoids cortisol and dexamethasone. These data indicate that glucocorticoid downregulation of STS is a widespread mechanism for controlling this enzyme and in turn for regulating estrogen availability to cells.

107 Thrasymachean approach to historical political ideology and modern government

Emily Vandegrift

Junior | Early Childhood Education | School of Education

Faculty Advisor: Thomas Ball

ABSTRACT:

In Plato's Republic, Thrasymachus emphasizes the capacity of political power to shape what he believes

to be justice. Throughout history, there are political ideologies that closely align with how Thrasymachus ties political power to justice. Even today, there is evidence of parallels of the political ideology of Thrasymachus to current political figures and their governments. Thrasymachus believes that not one type of government is better than another, but in every type of government a ruler rules to benefit the stronger in each particular type of society. This parallels many governments that today support Thrasymachus' idea that the laws that are put into place protect the rulers' power and that if the people of the government follow the laws that they have instated, it is benefitting the rulers that are in control and it leads the people that are following laws to believe they are being just.

108 *A Formidable Foe: Why Modern States are Unable to Defeat Insurgencies*

Taylor Wadsworth

Junior | International Relations | McNulty College and Graduate School of Liberal Arts

Faculty Advisor: John Sawicki, Ph.D.

ABSTRACT:

Fourth generation warfare has characterized the majority of conflicts fought since the Vietnam War. A term referring to conflict between seemingly disadvantaged insurgent opponents and conventional military powers, fourth generation warfare has challenged the strategies world powers have previously deemed successful. By examining conflicts such as the Chechen insurgency and the Iraqi and Afghan wars, this study seeks to explain the difficulties military powers face in defeating insurgent opponents. Often, war is a norm in the anthropological and moral contexts of insurgent societies, creating vicious morales that drive these non-statist groups to employ any viable means of destroying their opponent's will to fight. Moreover, tactical and organizational differences between insurgents and modern states provide insurgents with advantages on the battlefield. Insurgents, though technologically inferior, analyze and exploit the weaknesses of their opponent's strategies and weaponry. Furthermore, while modern states have centralized, identifiable structures, insurgents are decentralized and cannot be easily targeted. Diplomacy also frequently fails to quell insurgencies, as modern states cannot address each conflicting interest of these non-statist groups. This paper concludes with proposed strategies that intend to redress the strategies used by great powers when fighting asymmetrical wars. If modern states wish to effectively combat insurgencies, they must incorporate increased intelligence and humanitarian efforts.

109 *Development of the Field Isolation and Amplification of DNA Assay (FIA-DNA) kit: A Revolutionary Method for Species Identification of Unknown Samples*

Nickolas Walker

Senior | Forensic Science & Law | Bayer School of Natural and Environmental Sciences

Faculty Advisor: Jan Janecka, Ph.D.

ABSTRACT:

A major challenge in biodiversity conservation is the identification of unknown samples collected in the field. Most endangered species are elusive, therefore many monitoring programs rely on noninvasive sampling using scat or hair. One difficult hurdle is identifying unknown biological samples in the field

due to the reliance on genetic analysis in a laboratory. This can cause delays in obtaining important information and is often infeasible for many on-the-ground conservation efforts with limited resources. We are working to develop a Field Isolation and Amplification of DNA Assay (FIA-DNA) Kit for genetic field identification of species for both International conservation and management of Pennsylvania wildlife without the need for PCR and agarose gel electrophoreses. Preliminary results tested efficacy on snow leopard (*Panthera uncia*), bobcat (*Lynx rufus*), and coyote (*Canis latrans*) samples for species-specific identification. Our method using loop-mediated isothermal amplification (LAMP) of DNA has exhibited 100% specificity for over 30 previously extracted Snow Leopard scats. Coupling it with a modified FTA extraction has yielded successful detection in over 40% of tested scat samples to date. This method can be completed in under one hour with minimal equipment, using UV fluorescence within the reaction tube to confirm the species identification. We are optimizing this method for field deployment of the FIA-DNA kit at the Powdermill Nature Reserve in Rector, PA. The FIA-DNA kit will be tested for precision in identifying a wide range of scat samples in the field, eliminating the time and cost of lengthy lab-based analyses.

110 Reproductive Health Awareness Among Female Adolescents of Inner City Pittsburgh

Ella Walsh, Jamie Watt, Shaylene Carter, Ana Uribe

Senior | Nursing | School of Nursing

Faculty Advisors: Jessica Devido, Ph.D.; Cathleen J. Appelt, Ph.D.; and Andrew T. Simpson, Ph.D.

ABSTRACT:

Purpose: To describe the knowledge of reproductive health among adolescent females.

Methods: A quantitative descriptive study related to reproductive health with 25 females ages twelve to nineteen in a predominantly African American inner city school in Pittsburgh, Pennsylvania. Two questionnaires were administered. One questionnaire focused on assessing the sociodemographics of the sample population. The second questionnaire asked questions related to reproductive health and future career plans and aspirations. Descriptive statistics were calculated using SPSS.

Results: The findings of the study show that there is a lack of knowledge about reproductive health among adolescent females. The participants ranged from grades eight through twelve and included African Americans, Hispanics, and biracial students. Overall, 20.88% of participants answered the knowledge questions incorrectly while 27.4% of participants answered a subset of questions related to conception and safe sex practices incorrectly, with scores as low as 33%.

Conclusion: There is a need for further education related to female reproductive health among adolescent females. Being properly informed on female reproduction is important to make wise and healthy choices in regards to one's reproductive system and overall wellbeing.

111 Use of Amines as Replacement of Costly Excess Ligand to Regenerate [Cu(TPMA)Br][Br] in Photo-Atom Transfer Radical Addition (ATRA)

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Faculty Advisor: Tomislav Pintauer, Ph.D.

ABSTRACT:

Copper-catalyzed atom transfer radical addition (ATRA) is used for C-C bond formation through the addition of alkyl halides across alkenes to yield synthetically useful anti-Markovnikov products. Photo-ATRA is an avenue of interest versus ARGET (Activator ReGenerated by Electron Transfer) in recent studies. Excess ligand has been considered necessary to properly mediate copper catalyzed photo-ATRA. Literature reports have relied on added amines instead of costly ligands to facilitate the photo-ATRA reactions. This study investigated the role of secondary and tertiary amines on a primary alkyl halide (bromoacetonitrile) and a tertiary alkyl halide (ethyl 2-bromoisobutyrate) in ATRA with varying monomers. An ideal base:Cu(I) (L- ligand) ratio was optimized while also investigating different alkene: catalyst ratios. Kinetic studies offer an insight into the reaction rates of photo-ATRA reactions using either excess ligand or additive amines. The study reports promising data that a more cost effective and time saving methodology can be utilized in future Cu(I) catalyzed photo-ATRA reactions.

***112 Synthesis and Characterization of Li₂CdSn₃S₈, a Quaternary Thiospinel**

Ashley Weiland

Senior | Environmental Chemistry | Bayer School of Natural and Environmental Sciences

Faculty Advisor: Jennifer Aitken, Ph.D.

ABSTRACT:

Thiospinels have applications such as solid state electrolytes and cathode materials for solid state batteries. Ternary and quaternary thiospinels usually contain two or three transition metal cations. This newly reported quaternary material is the first known lithium-containing thiospinel that was synthesized in the solid state. Single crystals of Li₂CdSn₃S₈ have been obtained by heating pure metals and sulfur in evacuated silica tubes to 700 C. Structural analysis of Li₂CdSn₃S₈ by single crystal X-ray diffraction shows that it crystallizes in the centrosymmetric space group Fd-3m with a=10.5684(2) Å, Z=4, R₁=0.0152 and wR₂=0.0324 for all data. Li₂CdSn₃S₈ adopts the cubic spinel structure where the S²⁻ anions create the cubic closest packed array in which the lithium and cadmium/tin cations reside in one eighth of the tetrahedral and half of the octahedral holes, respectively. In this structure, the Cd and Sn cations are disordered on one crystallographic site with a 25% occupancy of Cd and a 75% occupancy of Sn. The three-dimensional [CdSn₃S₈]-2 framework comprised of (Cd/Sn)₆ octahedral units provides tunnels down the 110 directions where the Li⁺ cations reside. One can envision these tunnels as potential lithium-ion diffusion pathways. Analysis of the red crystals using scanning electron microscopy coupled with energy dispersive spectroscopy (EDS) provided a Cd-Sn-S chemical composition in agreement with that obtained from the single crystal X-ray structure solution; lithium cannot be detected by EDS. The phase purity of the bulk sample and bandgap of the compound were determined using X-ray powder diffraction and optical diffuse reflectance UV/vis/NIR spectroscopy, respectively.

113 *Language Processing in People with Various Types of Dementia*

Bridget Wiberg

Senior | Speech-Language Pathology | Rangos School of Health Sciences

Faculty Advisor: Sarah Wallace, Ph.D.

ABSTRACT:

The primary purpose of this project was to review the literature exploring individual features of reading comprehension and language processing in people with dementia. The secondary purpose of this project was to synthesize information about dementia to guide clinicians working with people with dementia. These cognitive skills have a major role in linguistic processing and were also taken into consideration. A breakdown in any of these cognitive processes will affect reading and auditory comprehension. Many studies that were reviewed compared the language processing of people with dementia to the abilities of healthy, older adults.

The researcher identified four peer-reviewed articles describing studies related to reading and language processing in people with various types of dementia. The results from these studies indicate a complex relationship between cognition and reading comprehension. Using these results, the researcher created a visual model that highlights the connection between cognitive and linguistic processes to help clinicians understand how specific deficits affect reading comprehension in people with dementia in their daily lives. This effect on the daily lives of people with dementia are outlined in four case study profiles created for this project. The findings regarding reading and auditory comprehension can be applied to people with wide range cognitive linguistic deficits across practice settings. Together, the visual reading model and the case study examples can guide clinicians providing services to people with dementia.

114 *Detection of Lead in Drinking Water Using a Homemade and Inexpensive LED-Based Fluorometer*

Gage Tiber, Aria Parangi, Partha Basu, Spencer Graves

Senior | Physics | Bayer School of Natural and Environmental Sciences

Faculty Advisor: Ted Corcovilos, Ph.D.

ABSTRACT:

We have built a portable system for measuring lead in drinking water. Lead is ranked by the EPA as one of the top environmental hazards in the US. One major source of lead poisoning is lead in drinking water, which comes primarily from old lead service pipes that were installed prior to lead being banned. This primarily affects homes built before 1950. Pennsylvania and Pittsburgh are at risk because of the high percentage of these older homes. Our system uses a fluorescent turn-on chemical sensor (Leadglow) that we measuring using a home built device. Our device uses an LED, photodiode, and optical wavelength filters to measure them amount of light emitted by the sensor molecule. We have calibrated our device to demonstrate a measurement sensitivity of 2 parts per billion (by mass), which is well below the EPA limit of 15 ppb. We have also taken preliminary data on 10 homes in the Hill District neighborhood of Pittsburgh.

115 Seasonal Alpha and Beta Comparison of Site 21 Wingfield Pines Metadata

Colleen Yanarella, Nancy Trun, Ph.D. and Michelle Valkanas

Junior | Biological Sciences | Bayer School of Natural and Environmental Sciences

Faculty Advisor: Nancy Trun, Ph.D.

ABSTRACT:

Wingfield Pines is a passive remediation system for abandoned coalmine drainage. Mine drainage is contaminated with many heavy metals and high levels of sulfate. The contaminated mine drainage flows out of abandoned mineshafts and contaminates local waterways that are used for agriculture and drinking water. Site 21 is located in the first remediation pond at Wingfield Pines, which denotes that it is the most contaminated pond. Next generation sequencing, using bacteria specific primers, was performed on isolated total DNA from Site 21 samples collected in April 2015, July 2015, October 2015 and January 2016. Using bioinformatics and the QIIME pipeline, we analyzed the metadata from 299,599 sequences. Alpha and Beta diversity comparisons of these sequence sets were used to determine the changes in the bacterial communities with changing contaminant levels.

116 Body Posture and Perceptions of the Homeless

Natalia Wohar

Sophomore | Psychology | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Alex Kranjec, Ph.D.

ABSTRACT:

Does a homeless person's posture affect our judgments about them? For example, is our perception of their helplessness or approachability affected by whether they are standing or sitting? To investigate this question experimentally, photographs featuring 5 different men in 5 different posture positions (standing, leaning, squatting, sitting, and laying) will be presented to participants in an online survey . Participants will rate the pictures on a scale of 1-4 in response to 3 different questions: (1) How capable do you imagine this person feels? (2) How safe do you imagine this person is to approach? (3) If this person asked you for \$1, how likely would you be to give it? It is predicted that posture will affect ratings across these questions. For example, photos with men in reclined positions are predicted to be perceived as relatively helpless and may be more likely to evoke a \$1 donation. Pictures of men squatting or standing may be perceived as more dangerous. The results of this study will inform our understanding of how the homeless are perceived and can be applied to public policy.

117 Revisits to the emergency department for community-acquired pneumonia: a four year experience

Lauren Zarger, Colton Collier, Lauren Curry, Samantha Heller, Michaela Palermo

Senior | Pharmacy | Mylan School of Pharmacy

Faculty Advisor: David Zimmerman, Pharm.D.

ABSTRACT:

Community-acquired pneumonia (CAP) commonly presents to the emergency department (ED). Current

CAP guidelines suggest treatment with either (1) a macrolide plus a beta-lactam, or (2) a respiratory fluoroquinolone if the local resistance rate of *Streptococcus pneumoniae* to macrolides is greater than 25%. In 2014, our institution's CAP empiric antibiotic protocol changed to reflect increasing resistance to macrolides. The purpose of this project was to determine the relationship between 30-day revisit rates of patients discharged from the ED with CAP and antibiotic selection, with focus on trends pre- and post-treatment protocol implementation. A retrospective single-center study of patients with ED visits for CAP was conducted on two temporal cohorts: 2012-2013 and 2014-15, including 741 total patients, to determine prescribers' compliance and see if there was a clinical effect on return rates following protocol implementation. Data collected included patient demographics, antibiotics received, and whether the patient revisited the ED within 30 days. Patients receiving antibiotics prior to presentation in the ED, under 18 years old, and patients admitted to the hospital from the ED were excluded. The proportion of patients receiving macrolide monotherapy decreased from 70.1% to 42.7% between the two cohorts, with increases in utilization of macrolide/beta-lactam combination therapy and fluoroquinolones, as anticipated due to the change in protocol. There was no significant change in ED revisit rates due to worsening pneumonia between the two cohorts, suggesting no difference in efficacy despite current guideline's recommendations. Larger prospective studies are needed to assess the current CAP guideline recommendations.

118 Vulnerable Populations, Mercer County, Pennsylvania

Megan Winner

Senior | Sociology | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Michael Irwin, Ph.D.

ABSTRACT:

Hydraulic fracturing, also known as fracking, is the process used to break apart subterranean rock formations to release natural gas. With growing use, concerns about the possible negative implications of the drilling and extracting procedure have been raised by professionals of varying disciplines. While the practice and resulting influence on health and the environment remain controversial, vulnerable members of the population will likely be the most susceptible to any potential risks. While some oil and gas locations are currently active, many additional sites have been leased but not developed. The purpose of this research is to investigate the particularly vulnerable, at-risk members of the population around leased oil and gas locations in Mercer County, Pennsylvania. Utilizing the geographic information systems software, ArcGIS 10.1, I will approach a spatial analysis with data from the United States Census Bureau and the American Community Survey to assess the demographics of the population within a certain radius of leased locations to identify the number of children and seniors in the area. The locations of schools will also be explored to evaluate any non-residential exposure to children. The oil and gas data will be accessed from Pennsylvania Spatial Data Access, fracktracker.org, as well as possible other scholarly sources, to retrieve shapefiles and other geographic data. This bivariate study aims to spatially analyze the population and oil and gas locations to identify characteristics of the population, specifically those which make individuals more vulnerable such as age and poverty status, nearest future exposure to hydraulic fracturing.

119 *No Value: Money and Material Possession as Symbols for Decaying Values in Faulkner's The Sound and The Fury and As I Lay Dying*

Elisha Jones

Junior | English | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Greg Barnhisel, Ph.D.

ABSTRACT:

The writings of William Faulkner are both heavily symbolic and heavily thematic. However, the question of the nature of money and material possession stands out heavily in Faulkner's fiction, and makes for an intriguing question of the implications of Faulkner's choice to constantly focus on money and material value. In Faulkner's fiction, money symbolizes the decay of Southern values in a familial, communal, and religious sense. This stems from not only Faulkner's upbringing which held the values of the Old South in high regard, but also from the history of the South that cultivated these Southern attitudes towards money. In my paper, I will describe how money operates as a symbol of decay in *The Sound and the Fury* and *As I Lay Dying*. In these works, Faulkner depicts both aristocratic and poor Southerners finding their values, and by extension their Southern identity, eroded by money.

120 *Servant Leadership: An Investigation of Servant Leadership Characteristics in Catholic and Secular Institutions*

Linnea Faccenda

Junior | Business Management | A.J. Palumbo School of Business Administration

Faculty Advisor: Elizabeth Bennett, M.A.

ABSTRACT:

Greenleaf's (1970; 1977) concept of servant leadership has gained significant traction in both research and application over the past few decades. The author is conceptually interested in how the fundamental characteristics of servant leadership as defined by Greenleaf (e.g., empathy, healing, awareness, stewardship, and commitment to the growth of others) are differentially experienced in young adults who are embedded in an institution with a culture espousing religious values compared to those who are members of an institutional culture with no religious affiliation. The present study aims to assess the central characteristics of servant leadership through students in both Catholic and secular school systems and explore how a Catholic culture versus a secular culture might aid or hinder molding a young adult into a servant leader. The author will conduct an exploratory mixed methods study by conducting in depth interviews with four students from a Catholic institution and four students from a secular institution to assess characteristics of servant leadership. Qualitative analysis will be conducted using thematic analysis (Braun & Clarke, 2006). A large scale survey via Survey Monkey will also be administered to 150 students who attend Catholic and secular school systems in which the basic characteristics of servant leadership will be evaluated according to Liden, Wayne, Zhao, and Henderson's (2008) servant leadership scale. Basic demographic information, including gender, age, religion, and ethnicity is also assessed. Quantitative analysis will be conducted in SPSS.

121 A study on the perceptions of physical activity in healthy college students

Cayla Leichtenberger, Angelina P. Gresko, Matt C. Kostek, Benedict J. Kolber, Kimberly A. Szucs and Anna M. Polaski

Senior | Occupational Therapy | Rangos School of Health Sciences

Faculty Advisor: Kimberly Szucs, Ph.D.

ABSTRACT:

Physical activity has been found to decrease one's likelihood of developing obesity and chronic ailments such as cardiovascular disease, diabetes, and cancer.¹ Sedentary behavior, however, has been found to be a risk factor for developing chronic disease.² Recent studies have shown that only 44% of the United States population receive the proper amount of exercise as recommended by the World Health Organization.³

This study aims to compare healthy college student's: 1) perception of the amount of time they spend completing physical activity to their actual amount of time completing physical activity, and 2) perception of their amount of time sedentary to their actual amount of time spent sedentary. The International Physical Activity Questionnaire (IPAQ), a self-administered assessment, was used to gather health-related physical activity data. The IPAQ is composed of 5 sections that ask questions about the kinds of physical activity that people do as a part of their everyday lives. Basis fitness watches were worn by participants over a one-week period to collect data on each subject's actual amount of physical activity during that time period. Our results indicate that college students perceive their time spent walking per day to be greater than their actual time spent walking according to the Basis watch ($p=0.0010$). Additionally, college students perceived their time spent sedentary on a given week day to be less than their actual time spent sedentary ($p < 0.0001$).

¹Warburton, D. E. (2006). Health benefits of physical activity: the evidence. *Canadian Medical Association Journal*, 174(6), 801-809. doi:10.1503/cmaj.051351

²Quartiroli, A., & Maeda, H. (2014). Self-determined engagement in physical activity and sedentary behaviors of US college students. *International Journal of Exercise Science*, 7(1), 87-97.

³Eijssvogels, T., George, K., & Thompson, P. (2016). Cardiovascular benefits and risks across the physical activity continuum. *Current Opinion in Cardiology*, 31(5), 566-567. doi:10.1097/HCO.0000000000000321

122 Integration of Noam Chomsky's "Syntactic Structures" and Douglas R. Hofstadter's "Analogy as the Core of Cognition"

Eric Chatterjee

Sophomore | Economics and Philosophy | McNulty College and Graduate School of Liberal Arts

Faculty Advisor: Sarah Durney, M.A.

ABSTRACT:

Say we have an analogy between chemistry and historical investigation into a culture- The analogy reads

“just as we can test for the chemical ingredients of a liquid by testing how it reacts with another chemical, we can examine the nature of a culture and its most prominent “ingredients” by how it changed upon interacting with another. Of course, chemistry and history are for all intents and purposes entirely separate from one another in terms of being delineated as disciplines in academia- their relation to one another here is predicated entirely upon an abstraction of the relationship between the chemical properties of a liquid and the way it reacts with another liquid- and somehow this abstract construct is identified as being relatable to historical investigation. This means that this abstract construct exists apart from both chemistry and history and exists within its own in the abstract of the mind, and is applied to different observed phenomenon in the world. One of the explanations proposed for the working of this device in the mind is Hofstadter’s “Analogy as the Core of Cognition.” In fact, this theory goes even further in proposing that the mind is essentially an analogical machine with analogies that are, to boot, analogically connected. In this paper, I plan to explore how this theory can be integrated with Noam Chomsky’s findings that all languages have common patterns of “syntactic structures” and the implications these propositions have for the conclusions and inquiries of cognitive science.

123 Mechanical and thermal design for a part-per-million laser wavelength meter

Jake Kline, Jahnavee Mittal, Isaac Davies, Tim Ireland, Gage Tiber
Sophomore | Physics | Bayer School of Natural and Environmental Sciences
Faculty Advisor: Ted Corcovilos, Ph.D.

ABSTRACT:

Michelson interferometry is a standard method for measuring the wavelength of unknown light sources. We describe a new design using a low-friction self-floating mirror carriage and a thermal stabilization circuit for a Helium Neon reference laser. With these improvements we reduce major sources of experimental noise and systematic uncertainty, improving the precision and accuracy of the wavelength measurements to better than part-per-million.

124 Reciprocal Learning through the St. Anthony’s Apartment Program

Jessica Carey, Joelle Ruggeri, Kathryn Westley and Sara Patrick
Senior | Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Ann Stuart, OTD,OTR/L

ABSTRACT:

The Duquesne University occupational therapy (OT) students are involved in community engaged learning (CEL) to enhance academic learning and to address societal needs. Through leading weekly groups at the St. Anthony’s apartment, fourth year OT students have gained experience working with the intellectual and developmental disability (I/DD) population. The St. Anthony’s program is a post-secondary education and vocational training for I/DD students under the age of 21. The students have deficits in problem solving, social participation, attention, communication skills, and sensory sensitivity. By providing occupational interventions as opposed to classroom activities, the students were able to cope with their varying deficits to enhance their participation. The curriculum includes safety, vocational, and life skills training necessary for living and working independently. The OT students have

learned how to plan activities to be all-inclusive to facilitate participation from everyone in the group. The OT students integrated therapeutic use of selves and the therapeutic modes under the Intentional Relationship Model to develop their interpersonal and clinical skills. Using each mode under this model was useful to engage the students in coping skills, money management, and social interaction. Building a therapeutic relationship with the students increased their ability to teach them the vocational and life skills outlined in the St. Anthony's curriculum. OTs serve as a beneficial addition to this setting in order to promote optimal participation in activities of daily living to better prepare the students for independent living.

125 Occupational Therapy Students at Goodwill Aspire

Adriana Brown, Justin McTish, Valerie Palermo, Carly Zandier
Senior | Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Ann Stuart, OTD,OTR/L

ABSTRACT:

Individuals with intellectual and developmental disabilities are one of the populations that occupational therapists work with. This population of individuals struggle with social participation and being integrated into a typical community setting. Goodwill Aspire in Lawrenceville is a day program that works to help clients improve necessary life skills, such as socialization, adaptive and domestic skills improve their chances of finding paid work. Understanding the perspectives of people with intellectual and developmental disabilities can help occupational therapists support meaningful participation in multiple aspects of their life. By fully understanding the occupational profiles of each individual in the program, occupational therapists can create individualized long term plans for each client. These plans enable the clients to achieve the goal of finding paid work or volunteer positions. It is important when looking at this population to view the client in a holistic way and to take into consideration their values and needs. Occupational therapists' holistic approach aims to work on and improve the social and coping skills and work to establish habits and routines that increase their occupational engagement in their daily activities. The clients in this program would benefit from the skill set of occupational therapists to develop client-centered treatment that will increase their independence and overall quality of life.

126 Counterproductive Work Behavior and Narcissistic Personality in the College Setting

Mary Comis, Angela Griffo
Senior | Psychology | McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Elizabeth Bennett, M.A. Clinical Psychology, Ph.D. Doctoral Candidate

ABSTRACT:

In this experiment, the researchers intend to examine how drug use and the narcissistic personality trait correlate to counterproductive work behavior in the college setting. A sample of 123 college students, between the ages of 18 and 22, completed the survey. Assessing for the narcissistic personality trait, the students completed the Narcissistic Personality Inventory (Raskin & Hall, 1979). This is a 40-item measure of narcissism in which participants are asked to choose between two situations, selecting the

situation that they “most identify with.” The students’ counterproductive work behavior was evaluated using the Counterproductive Behavior Measure: From Development of a Measure of Workplace Deviance by Rebecca J. Bennett and Sandra L. Robinson. The survey has 24 items about deviant behaviors that could possibly take place in the work area, and was adjusted as needed to the college environment (Bennett, 2000). Item responses are on a 7-point Likert scale (1 = never; 7 = daily). The researchers will analyze the collected data and explore the correlation between the phenomenon of drug use, narcissism, and counterproductive work behavior in academia.

127 Withdrew Submission

128 Attachment Anxiety

Loretta Dougherty

Sophomore | Music Therapy | Mary Pappert School of Music

Faculty Advisor: Elizabeth Bennett, M.A.

ABSTRACT:

According to psychoanalyst, John Bowlby (1969/1982), human attachment can be defined as the close connection to another person or caretaker that a child forms at birth. It can be physical or emotional and usually develops at early childhood. However, factors such as being adopted can impact the development of human attachment. This mixed method study explores the hypothesis that Chinese adopted girls that lived in orphanages prior to their adoption are more prone to attachment anxiety than Chinese adopted girls that lived in foster care before being adopted. This study will have three groups: Chinese adopted girls that from orphanages that grew up in America, Chinese adopted girls from foster care that grew up in America and American girls who live with their biological parents in America who will be semi-structured interviews and surveyed on measures of attachment anxiety, stress, depression, and loneliness. There will be 15 participants from each group.

129 Occupational Therapy and Community Engaged Learning: Psychosocial Interventions for Students with Intellectual and Developmental Disabilities (IDD)

Ryan Drabik, Clara Altemus, Joanna Eskander, & Kristen Morgus

Senior | Occupational Therapy | Rangos School of Health Sciences

Faculty Advisor: Ann Stuart, OTD,OTR/L

ABSTRACT:

The objective of the occupational therapy community engaged learning (CEL) experience is to increase the occupational performance of students with intellectual and developmental disabilities (IDD) in financial management, social participation, health and wellness, and home management. An additional objective is to increase occupational therapy students’ knowledge in clinical reasoning and treatment planning processes. The target population is the students of the St. Anthony’s program -- a post-secondary educational entity located at Duquesne University through the Diocese of Pittsburgh. The

literature argues that community participation and social inclusion interventions promote optimal performance, specifically for those with IDD. Duquesne University occupational therapy students implemented four modules, each spanning over three weeks, aimed at improving independence in community living skills with a specific group of eight students. Interventions lasted for two hours each week with a cumulative community experience at the end of each module to evaluate students' knowledge. Experiences included (1) budgeting a weekly allowance to calculate a restaurant bill with tax and tip, (2) successfully demonstrating social norms and interactions with staff in the community, (3) augmenting knowledge of health and wellbeing, and (4) increasing instrumental activities of daily living (IADL) performance to foster independence with home management skills in their community-based apartment. The occupational therapy students hypothesized that St. Anthony's students would successfully demonstrate an increase in performance in weekly interventions. Successfully implementing these programs through St. Anthony's allows students to better participate in their community and be successful in future occupational endeavors.

130 *The Role of Hip-Hop in American Culture*

William Emanuel

Junior | Secondary Education -- Social Studies | School of Education

Faculty Advisor: Andrew Simpson, Ph.D.

ABSTRACT:

In July of 1982, the song "The Message" by Grandmaster Flash was released which proceeded to launch the genre of Hip Hop to be used as a force of change. The song critiqued the conditions of the neighborhood the in New York the group was from, and has been considered a classic in the Hip-Hop community. It was the first of many songs in the genre being used as a tool for a change. By presenting faults in our society to a much wider audience, artists have been able to attempt to achieve a more positive community for the people they represent.

Many groups of people in the genre have used the genre as a tool for expressing the issues they face including racism, economic inequality, police brutality, and drug use. These songs contain references to historical events in the United States or personal reflections of a regular day that they or the community they represent go through. By drawing on history, artists provide strong legitimacy for the need of change. This paper analyzes the past four decades, and how events or ideas have been reflected in Hip-Hop songs. The paper concludes by showing that if our society does not change, Hip-Hop will be there for the voiceless to express themselves to a much wider audience.

131 *shepherd's Heart Veteran's Home: OT Students Teach Life Skills to Homeless Veterans*

Elana Famularo, Angelina Gresko, Healy Hindley, Christina James

Senior | Occupational Therapy | Rangos School of Health Sciences

Faculty Advisor: Ann Stuart, OTD,OTR/L

ABSTRACT:

Shepherd's Heart Veteran's Home (SHVH) is a transitional housing facility for homeless veterans located in downtown Pittsburgh. SHVH has religious roots, which is a key aspect in helping veterans regain their

spirituality. The program provides members with a place to sleep, eat three times a day, and support future success by honing life skills including anything from money management to resume building. Occupational therapy has an important role in working with this population due to their physical and mental limitations. Occupational therapists help a variety of populations participate in the things they want and need to do through therapeutic use of everyday activities (occupations). Our passion for working with these veterans stems from the injustice that they risked their lives to serve our country and are now marginalized and homeless. The overall goal for us as students is to assist the veterans to engage in important occupations and live independently outside of SHVH. Our focus is to build rapport with these men and help them rediscover their potential. Leading limitations that influence the veteran's ability to perform occupations include poor health, unemployment, poor interpersonal relationships, and the inability to solve personal barriers. The interventions that we implemented and have found successful include vocational, health and wellness, and leisure training. This population has been rewarding to work with and has shaped us as future clinicians. We believe our experiences could be beneficial to those working with a similar population in the future.

132 3-D Modeling and Manufacturing of Assistive Tools for Occupational Therapy Patients

Veronica Balko, Jacqueline Matz

Junior | Occupational Therapy | Rangos School of Health Sciences

Faculty Advisor: Kimberly Szucs, Ph.D., OTR/L

ABSTRACT:

Background: Many occupational therapy patients struggle with grip strength due to various causes. Poor grip strength may be caused by nerve damage, muscle or tendon damage or disease, or bone, joint, or ligament problems. Examples of these problems include myasthenia gravis, carpal tunnel syndrome, and rheumatoid arthritis. Additionally, three-dimensional (3D) printing is a growing and innovative technology that is slowly paving its way into the medical community. With its upcoming prevalence in the prosthetic world, 3D printing is becoming more involved with creating cheaper adaptations that aid in a person's daily activities. **Purpose:** Our goal was to use the innovation of 3D printing in order to aid those lacking grip strength. The aim was to create an assistive device that can be built up or broken down to accommodate for specific activities the client wishes to complete. The focus was designing a 3D printed device that composed of different components to aid in eating, drinking, writing, and reading. **Methods:** Three-dimensional modeling through Fusion 360 was used to create a set of devices that assist in gripping. The device has interchangeable parts that can be swapped out to assist in a variety of tasks. Once the devices were printed, they were finished using standard methods like sanding, printing, etc. **Conclusion:** We hope to implement our device first on individuals not lacking grip strength to ensure comfort and practical use. Then, to present and implement our device to a specific patient population suffering from hand deficits to improve their daily lives.

133 Community Engaged Learning with Homeless Women

Megan Graf, Ashley Ames & Molly Gomez

Senior | Occupational Therapy | Rangos School of Health Sciences

Faculty Advisor: Ann Stuart, OTD,OTR/L

ABSTRACT:

Despite the high prevalence of homeless individuals in the United States, they are a population that most often experiences stigma. Through experiences with the women at Bethlehem Haven, the lack of services afforded to the women was evident. By completing interviews and observations, it was apparent these women suffer from role disruptions and various imbalances in their lives. After completing research, there is clearly a need for additional services including: a variety of health care options, housing options after shelter discharge, and the necessity for inclusive shelters. As Occupational Therapy students at Duquesne we are taught to help out those living on the margins, and this is a highly marginalized population. Through working with this population, we have found a higher incidence of serial homelessness, because these women often do not have positive role models, coaching, or resources. As Occupational Therapy students we can teach them new routines and habits that could have a positive impact on their lives, as well as introducing them to community services and resources. It may be difficult for them to find the services they require, but if we can locate and organize relevant services they will find more success. The continued work with this population will decrease their time being homeless and will allow them to be more confident in their own abilities.

134 *Community Engaged Learning at CLASS*

Kelsey Blackburn, Sarah Cousino, Haley Yow, Paige Wensel

Senior | Occupational Therapy | Rangos School of Health Sciences

Faculty Advisor: Ann Stuart, OTD,OTR/L

ABSTRACT:

Occupational therapy is a client centered health science profession that focuses on holistic skill building to promote independence in daily activities, that are client-centered and focused on skill building. Community Engaged Learning (CEL) is a crucial part of the occupational therapy curriculum at Duquesne University. One CEL site that is visited is Community Living and Support Services (CLASS) in Swissvale, which provides services for adults with physical and cognitive disabilities in the Pittsburgh area. Currently, there are no occupational therapy services offered at CLASS. Occupational Therapy will provide the CLASS participants with new approaches to optimize performance in daily tasks. It will promote meaningful participation and self expression through alternative activities, and intervention strategies. Students at this site engaged and interacted with clients, develop personal relationships, enhance learning, and promote professional development. The students gained knowledge regarding specific diagnoses, interpersonal skills, leadership skills, advocacy skills, communication skills, problem solving skills, and professional habits. As the students were treating and educating the clients, the students gained knowledge themselves. Through the experience at CLASS, the students promoted the client's involvement in activities, social participation, and self-expression. Both the students and the clients were provided with opportunities to learn and engage with one another, growing as individuals and professionals. CLASS is a mutually beneficial learning environment for clients, staff, and OT students.

135 Dharma in Hinduism

James Matson

Sophomore | Chemistry | Bayer School of Natural and Environmental Sciences

Faculty Advisor: Diana Dawson

ABSTRACT:

It is often said that Hinduism is more of a lifestyle than a religion. One of the most important aspects in Hinduism is called dharma. This refers to “the principle of cosmic order”. In other words, the duty that is expected from an individual that corresponds to their position in life. The most popular example of such dharma is present in the Bhagavad Gita, where Arjuna has to be consulted by Krishna about confronting his own dharma. Over time the barriers between classes have been broken down, allowing more fluidity of dharma from person to person, but in the end it still plays the same vital role: giving direction to the behaviors needed to maintain the order of the life and universe. In this project I delve into what dharma means for individuals in different walks of life, and how it influences what they do on a daily basis.

136 Using Art History as a Part of STEAM: Promoting Interdisciplinary Learning and 21st-Century Skills at the Elementary Level

Christina McElwee

Junior | Early Childhood Education | School of Education

Faculty Advisor: Dominic Leo, Ph.D.

ABSTRACT:

The push for STEM programming (Science-Technology-Engineering-Math) is fundamental to the future of both American education and the American economy. But a crucial element is lacking - the arts. Adding them will effectively convert STEM to STEAM, enriching traditional content standards with nuanced skills I feel are necessary for improving student success in the modern era. Using interdisciplinary learning through art education permits the instructor to target skill sets such as bias recognition, critical thinking, and acknowledgement of ethical concerns. For this reason, I carefully chose globally diverse works of art from a broad range of mediums, and created lesson plans which actively incorporate them. Through art analysis, instructors would create a new, interdisciplinary, and pliable learning method, which seamlessly incorporates other STEAM fields. In this way, teachers would be training students in 21st-century skills as they progress through STEAM activities. These skills include cooperation, creative problem-solving, critical thinking, global awareness, and information literacy. The exploratory use of STEAM activities, the development of 21st-century skills through STEAM activities, and the benefits of interdisciplinary teaching through art will foremost serve to combine and feed into each other, thereby offering the potential to prepare a new generation for the future. As a direct result, students will experience a striking enhancement of connection and retention skills. It is clear that America needs STEAM. Our country will thrive on the infinite possibilities that an interdisciplinary format incorporating art provides, propelling the educational system into the twenty-first century.

137 Withdrew Submission

138 Occupational Therapy and Renewal Inc.

Quinn Tattersall, Brittany Niro and Nikki Yeckel

Senior | Occupational Therapy | Rangos School of Health Sciences

Faculty Advisor: Ann Stuart, OTD,OTR/L

ABSTRACT:

For two semesters, we had the opportunity to work with individuals through Renewal Inc. as occupational therapy students. This organization seeks to assist with positive reintegration of ex-offenders into the community. Our goals include helping to educate, prepare, and provide tools for these individuals to succeed in job readiness, social participation, and coping mechanisms. To do this, we have focused on building strong therapeutic relationships, assessing their needs, and providing client-centered interventions. Such interventions include social role-playing difficult situations, understanding their personality through reflection, health education, and team building exercises. So far, these individuals have demonstrated increased self-awareness, improved social skills and communication, increased motivation to dedicate themselves to recovery, positive peer interactions and acceptance of encouragement, and reestablishing purpose and meaning in their lives. We have found that occupational therapy services are beneficial to this underserved population due to our focus on incorporation of meaningful occupations and client centered practice. The outcomes of our experience relate greatly to the Duquesne University mission. This statement includes an attentiveness to local concerns, service to the community, and commitment to diversity. Understanding this connection is imperative as students of Duquesne University, since these are values we carry during each interaction with a client. Our experience at Renewal Inc. has been a meaningful example of such an interaction that has not only improved our clinical skills as future occupational therapy practitioners, but as students of a University that emphasizes the Spiritan mission.

139 The Thirteen Roses of the Spanish Civil War - Las Trece Rosas de la Guerra Civil de España

Rachel Williams

Junior | Spanish, Communication Studies | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Lucia Osa Melero, Ph.D.

ABSTRACT:

The Spanish Civil War, which took place from 1936 to 1939, had a deep and lasting impact on Spain. During this hard time of the nation's history, when the country was divided by The Nationalists (Los Nacionalistas) and The Republicans (Los Republicanos), emerged a group of young women who, against all odds, decided to fight against their oppressors. This courageous group, many still teenagers, started a fight against the right-wing party, Los Nacionalistas. Rooted in opposition to what would become a long-lasting military dictatorship, each woman brought a unique perspective to the fight. In fact, for almost four decades Spaniards would struggle to find independence and freedom under the dictatorship of Nationalist leader Francisco Franco. As the Civil War raged on, it became clear that each woman's individual story was about to change – for better or for worse. On August 5th, 1939 the thirteen women were executed by the Nationalists in the Eastern Madrid Cemetery, however their stories survived. Each person's story is unique in nature yet united by passion to fight for what is fair and right. As time passed,

the women became known as the Thirteen Roses (Las Trece Rosas), inspiring literature, art, and cinema; yet, today many people are still unfamiliar with this story. It is a story that needs to be passed along to each generation, especially to women, to ensure a future world filled with justice, respect, and tolerance.

140 Student Occupational Therapy at Blind and Vision Rehabilitation Services of Pittsburgh

Jacqueline Tyszkiewicz, Courtney Brisson and Dara Willis

Senior | Occupational Therapy | Rangos School of Health Sciences

Faculty Advisor: Ann Stuart, OTD, OTR/L

ABSTRACT:

The Pittsburgh Blind and Vision Rehabilitation Services (BVRS) facility offers a program called Employment Transition Services (ETS). Through this program, individuals with blindness, low vision deficits, physical disabilities, and intellectual disabilities are provided vocational training to develop skills that can be utilized in their community. Through this program, individuals are also afforded the opportunity to engage in social interactions with their co-workers and BVRS staff. When they attend ETS, they are assigned jobs that simulate vocational tasks that they may encounter in the workforce. According to the Occupational Therapy Practice Framework (2014), work is included as a primary occupational area that includes employment interests, acquisition, and job performance (AOTA, 2014). As occupational therapy students, we specialize in treating clients holistically, including all occupational areas that are meaningful to the clients. According to AOTA Vision 2025, "Occupational therapy maximizes health, well-being, and quality of life for all people, populations, and communities through effective solutions that facilitate participation in everyday living" (2016). In this population, increasing vocational and social participation skills will optimize our clients' involvement in the community and will provide them with a more independent way of life. Over the course of this semester, we have created interventions targeting coping mechanisms, sensory integration, self-concept and efficacy, and social participation. The outcomes of these interventions were measured through participant and staff interviews and surveys. Based on this feedback, we believe that the BVRS population would greatly benefit from ongoing occupational therapy services.

141 Human Cognition in Comparison to Monkeys

Mark Williams

Sophomore | Psychology | McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Elizabeth Bennett, M.A.

ABSTRACT:

This paper explores why humans distinct capability of cognition is what separates us from all other animals. Articles that have studied Cognition in relation to humans and monkeys are used to shed light on our mental differences. Cognition is defined as "conscious mental activities: the activities of thinking, understanding, learning, and remembering" (Merriam-Webster.com, 2016). An article written by de Waal & Ferrari (2010), took a bottom-up perspective to ask what animals (if any) "possess a theory of mind, culture, linguistic abilities, future planning". Since humans use speech, we can communicate

efficiently and directly. We live with a sense of the future and time, while animals live in the moment. In a separate article written by Tomasello & Call (1994), gives a perspective on what the social cognition of apes and monkeys. Using these sources, we can begin to understand why we are much more mentally complex creatures than apes and monkeys. To test whether monkeys have cognition like humans do, a similar test to the one conducted by A. Ennaceur & and J. Delacour on the memories of rats will be used. Five children of the age of 2 but no older than 2 and a half will be randomly selected. Five monkeys will also be randomly selected for testing. Just as in the study by A. Ennaceur & and J. Delacour both test subjects will be exposed at first to two identical unfamiliar objects (X1 and X2) for one minute. One of these objects will be removed and replaced with two more unfamiliar objects (X1, Y1 and Y2) for a minute. In the next test the first familiar object will be brought back along with 2 more unfamiliar objects such that the objects are X2, Z1 and Z2 for one minute. The subject with better cognition should spend less time exploring X2 as they have seen it before and more time examining Z1 and Z2 because they are new. As humans have began to develop cognitive abilities at around age two, the children should remember the old objects thus spend more time exploring the unfamiliar ones. Monkeys on the other hand lack such cognitive skills such as a reference memory, so they should view all the objects as unfamiliar regardless to whether they are in fact unfamiliar or not.

142 OT Services at Emmaus Community of Pittsburgh

Emily Reilly, Jenna Beck, Cayla Leichtenberger

Senior | Occupational Therapy | Rangos School of Health Sciences

Faculty Advisor: Ann Stuart, OTD,OTR/L

ABSTRACT:

Community Engaged Learning (CEL) is an important aspect of the occupational therapy (OT) program that has had a large influence on our learning and experience at Duquesne University. Occupational therapists are known for their ability to treat populations of all varieties, including those with Intellectual and Developmental Disabilities (IDD). The Emmaus Community of Pittsburgh, specifically the Jordan House, located in South Side, serves two elderly women with neurological diagnoses. After working with these women for a total of eight months, we will have gained knowledge about working with an under-served population, for OT services are not often provided for elderly patients with persistent disabilities. Because these individuals have not received consistent OT services, their ability to maintain a level of independence often decreases at a quicker pace due to the combination of their age and diagnosis. Topics that are of focus during our weekly interventions include social and community participation, completion of self-care skills, leisure participation, and emotional regulation. This CEL experience has built our interprofessional and clinical skills that will help us become successful occupational therapy clinicians.

143 The Effect of Alternate Seating on Improving Attention and in Seat Behavior of Preschoolers with Autism

Kristen Morgus

Senior | Occupational Therapy | Rangos School of Health Sciences

Faculty Advisor: Jeryl Benson, EdD, OTR/L

ABSTRACT:

The purpose of this study was to determine the effects of alternate seating on improving the attention and in seat behaviors of preschoolers with and without autism.

A single subject, A-B-A-B design was employed across four participants who had a diagnosis of Autism. The study took place in the child's classroom during morning circle time. During baseline phases (A), all children in the class and the participants used the floor during morning circle; during intervention phases (B), all children in the class and participants used alternate seating devices (therapy balls, disc-sit cushions, T-stools, or a cube chair) during morning circle time. The study took place over a four week period, with each phase lasting one week. Data was collected via videotape of morning circle two times per week for each week of the study, followed by independent review by the primary investigator and student researcher. In seat behavior and attention were documented for each participant. Data analysis is currently undergoing. Data will be analyzed to provide frequencies and percentages for all of the individual behaviors identified for each child. It is hypothesized that when provided alternate seating, attention and in-seat behavior will improve for children with Autism. Limitations and implications for occupational therapy practice will be discussed.

144 *The Value of Occupational Therapy for Homeless Women*

Erin McGrady, Lauren Ducey & Megan Lonergan

Senior | Occupational Therapy | Rangos School of Health Sciences

Faculty Advisor: Ann Stuart, OTD,OTR/L

ABSTRACT:

The role of an occupational therapist provides unique services for homeless women to develop habits, roles, and routines, and encourage meaningful participation in occupations. The women that are served at Haven Homes experience chronic homelessness due to financial instability, mental illness, or other health related problems. The women experience occupational performance issues of decreased role fulfillment, performance of daily activities, participation in satisfying routines, and lack of motivation. Specific Occupational Therapy Practice Framework needs include role competence, occupational participation, quality of life, and occupational injustice. Occupational therapists can provide a unique set of skills such as client-centered focus, holistic perspective, and use of evidence-based practice to ameliorate these problems. Occupational therapy interventions for homeless women include group therapy, art therapy, self-awareness education, and establishing habits and routines. These interventions have increased participation and satisfaction among the women at Haven Homes. In conclusion, occupational therapy services are beneficial to homeless women and can improve all aspects of their functioning.

145 *Sectarianism in the Soccer Derbies*

Connor Bamrick

Sophomore | Secondary Education/ Social Studies | School of Education

Faculty Advisor: Jotham Parsons, Ph.D.

ABSTRACT:

Soccer is the world's game, and with the world, soccer reflects the aspects of everyday life that cannot be denied. Soccer takes on its own persona with its own storylines and rivalries. With some rivalries, referred to as either derbies or clásicos, are the pinnacle of sports transgressing beyond "just a game". There are some derbies that have become noteworthy, for all fans around the world, like Scotland's "Old Firm" between Celtic and Rangers FC, Serbia's "Eternal Derby" between Red Star Belgrade and Partizan Belgrade, and Spain's "El Clásico" between FC Barcelona and Real Madrid; these have serious sectarian undertones to the game, which in most cases involves the use of force on the opposing viewpoint. Each of the derbies have some geopolitical implications to them; "Old Firm" represents the battle between Scots-Irish Catholics and Scottish Protestants in Glasgow; the "Eternal Derby" represents the battle between the government and the army in post-World War II Yugoslavia; "El Clásico" is the battle of Catalonian independence, Real Madrid is "Franco's team", and FC Barcelona being the opposition's team. These games allow the fans to escape their lives for a couple hours and belong to something that is greater than themselves.

146 Understanding the implementation of home programs for upper extremity motor recovery with persons post stroke: Capturing occupational therapy practitioners' practice and perspectives

Lauren Ducey, Valerie Palermo

Senior | Occupational Therapy | Rangos School of Health Sciences

Faculty Advisor: Elena Donoso Brown, Ph.D., OTR/L

ABSTRACT:

Stroke is the number one leading cause of long-term disability in the United States. Occupational therapists working with stroke survivors aim to rehabilitate the physical, cognitive, and emotional effects through a client-centered and holistic approach to treatment. About half of stroke survivors report hemiparesis in the months following the stroke making the functional use of the arm a focus of occupational therapy intervention. Direct services are often limited, leading OTs to use home programs as a means of extending services despite adherence to these programs being low. This study is a follow-up to a national survey of occupational therapy practitioners and aims to deepen the understanding of occupational therapists' perspectives on home program implementation for persons post-stroke. A qualitative descriptive approach using semi-structured interviews with occupational therapy practitioners who have experience creating home programs for individuals post-stroke was conducted. Each participant completed a single 45 - 60 minute telephone interview. Interviews were transcribed verbatim and coded using a content analysis approach with triangulation. This poster will outline preliminary findings from the first four participants in the areas of 1) home program creation and progression 2) the incorporation of technology into home programs and 3) strategies to support adherence. Finally, how these findings impact the understanding of occupational therapy home programs for upper extremity recovery with individual post-stroke will be discussed.

***148 Is "Help", Helpful? Analyzing Foreign Aid in Context of Scale**

Catherine Hull

Senior | Information Systems Management & Accounting | A.J. Palumbo School of Business

Administration

Faculty Advisor: Matt Ryan, Ph.D.

ABSTRACT:

Foreign aid comes in many forms. Foreign aid ranges from large scale disaster relief to small scale individual projects within communities. Most have the same goal – to help those who would benefit from assistance. This case study answers the question, “What form of ‘help’ is helpful?. Which type of aid best achieves what it sets out to accomplish?

To directly analyze the effect of foreign aid on a region, the water-conscious organization Pure Thirst traveled to the rural community of Olkokola, Tanzania. Pure Thirst worked alongside the community members to provide a form of humanitarian aid: improved water services to the community. In light of this experience, the humanitarian aid that Pure Thirst provided to Okakola is the basis for this case study.

Based on the outcome of Pure Thirst’s project in comparison with governmental aid, it can be concluded that all cross-culture, foreign aid often present certain challenges. However, in terms of effectiveness (not efficiency), a local, grassroots level project which values community input is an optimal approach to foreign aid efforts.

149 *An Analysis of Psychological Manipulation in Military Culture

Kevin Chu

Freshman | Health Management Systems | Rangos School of Health Sciences

Faculty Advisor: Kathleen Roberts, Ph.D.

ABSTRACT:

While strict discipline is substantiated as necessary by the armed forces, this creates an environment where individual decision-making is oppressed in favor of mob mentality. Much like how individuals adhere to the culture of common society, the military presents its own social structures for its soldiers. The film *A Few Good Men* (1992) explores these military institutions where its hierarchal structure emphasizes motifs of obedience, ideology, conformity, and labels, which are central to how it deals with unpredictable problems. Although necessary, these shape the underlying vulnerable psychology of soldiers who learn to view themselves as instruments for superiors, to coincide to militaristic morals, and to seek a sense of community. Psychosomatic research places these in context to the similar nature of identity depravity in prison, authoritarianism, and the reduced sensibility of actions through routinization--all of which play a role in the mental manipulation that the film analyzes in soldiers who conform to military ideals. This paper explores the potential moral, physical, and mental abuse that these military standards can provoke through the psychological exploitation of individual soldiers, which the overall military environment reinforces.

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