



THE SECOND ANNUAL
UNDERGRADUATE
RESEARCH AND
SCHOLARSHIP
SYMPOSIUM

WEDNESDAY | 2010
FEBRUARY 17



Sponsored by: Academic Affairs, Office of Research, and Center for Biotechnology



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Acknowledgements

This symposium would not have been possible without the hard work and diligence of the Undergraduate Organizing Committee members.

Kristen Friedrich - Chair
Amanda George
Lauren Fouse
Marty Holden
Kylie LaSota
Bryan Seybert
Justin Stadelmyer
Eddie Strauser

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Academic Affairs
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The Office of Research and Ms Julie Christy
University Events

All of the Faculty Mentors and Advisors for their unselfish service to and support of our undergraduate researchers

Schedule of Events

2nd Annual Undergraduate Research and Scholarship Symposium

February 17, 2010 - Power Center Ballroom

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| 8:00 a.m. – 9:00 a.m. | Student set up Continental breakfast for participants |
| 9:00 a.m. | Doors open to the public Refreshments will be provided for guests |
| 9:00 a.m. – 10:30 a.m. | Informal poster session Guests are invited to walk around, peruse student projects, and engage with the students |
| 10:30 a.m. – 11:30 a.m. | Official Welcome Dr. Alan Seadler, Associate Academic VP for Research Keynote Speaker: Dr. Arnetha Ball “Research And Its Application to Society’s Issues: Developing a New Generation of Researchers” |
| 11:30 a.m. – 12:30 p.m. | Formal Presentations Session #1 |
| 12:30 p.m. – 1:30 p.m. | Break for Lunch Boxed lunch provided for participants |
| 1:30 p.m. – 2:30 p.m. | Formal Presentations Session #2 |
| 2:30 p.m. | Awards Closing Remarks |

Keynote Speaker



Arnetha Ball Ph.D.

*Dr. Barbara Sizemore Distinguished Professorship in Urban Education -
Duquesne University*

Professor of Education – Stanford University

One of the world's leading authorities in urban education, Dr. Ball is currently pursuing an ambitious interdisciplinary research agenda that aims to improve education for urban populations in three intersecting contexts: American schools in which predominantly poor African American, Latino and Pacific Islander students are underachieving; community-based organizations that are part of an alternative education providing “second chance” or “last chance” opportunities for individuals in search of personal, academic and economic success; and teacher education programs across the United States and South Africa. This research integrates socio-cultural, sociolinguistic and ethnographic approaches to investigate the processes of teacher change and development, as well as the language and literacy practices of students in multicultural settings. Before entering the professorate, Dr. Ball was a speech/language pathologist, taught in pre-school, elementary and secondary classrooms for more than 25 years, and founded and directed an early education center for students of diverse backgrounds.

Undergraduate Presenters

Presentation Schedule

11:30 AM **Suzanne Daghestani**, OTS, Emily Syzmanski, OTS and, Jaime Munoz, PhD, OTR/L, FAOTA, *Goal Setting: Comparison of the COPM and KAWA.*

Rangos School of Health Sciences.

Advisor Jaime Munoz PhD, OTR/L, FAOTA
Abstract No. 15

11:45 AM **Mary Sasinowski**, Chloe Weisburg, Khristian-Erich Bauer-Rowe Ramos, and Jennifer Wu, *The Ability of C5 Protein to Restore Catalytic Function in Mutated RNase P.*

Mylan School of Pharmacy,
Abstract No. 33

12:00 PM **Nicole Bachman** and Kate Armstrong, *Nursing Care to Prevent Post Operative Pulmonary Complications,*

School of Nursing

Advisor Melanie Turk Ph.D., RN
Abstract No. 8

12:15 PM **James Brancho**, Cocaine Interactions with Dopamine Transporter Proteins

Bayer School of Natural and Environmental Sciences

Faculty Advisor.. Jeffrey D. Madura, Ph.D.
Abstract No. 41

1:30 PM **Sara Heinlein**, *Rescue Personality Extraversion Across Firefighter Populations*,

McAnulty College and Graduate School of Liberal Arts

Faculty Advisor Thomas Hallinan M.A.

Abstract No. 2

1:45 PM **Jason Hunt**, *Serve to Rule or Rule to Serve? An Analysis of Congressional Casework*. McAnulty College and Graduate School of Liberal Arts,

Advisors Charles Rubin Ph.D., Clifford Bob Ph.D. J.D.

Abstract No. 24

2:00 PM

2:15 PM **Anthony Lucas**, *Retirees and Health Insurance: An Analysis of Their Private, Public and Out of Pocket Usage After They Migrate South*.

A.J. Palumbo School of Business Administration

Advisor Risa Kumazawa Ph.D.

Abstract No. 39

Presenting Student is listed in bold letters

Abstracts

Number 1

Authors: Sara L. Sullivan, OTS, Kelly L. Anzaldi, OTS, Michael C. Fantuzzo, OTS, Dr. Patricia Crist, Ph.D., OTR/L, FAOTA

Year: Senior

School: Rangos School of Health Sciences

Faculty Advisor: Patricia Crist, PhD, OTR

Title: Occupational Performance Changes Secondary to Significant Weight Loss

Abstract:

Number 2

Authors: Sara Heinlein

Year: Junior

School: McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Thomas Hallinan, MA

Title: Rescue Personality Extraversion Across Firefighter Populations

Abstract: In the world of emergency services, there is question of whether responders possess a common set of traits that enable them to effectively perform duties that average citizens find difficult to endure. This set of traits was nicknamed the “rescue personality” and has been the topic of much discussion. Previous research in the area has indicated that statistically significant differences exist between civilian and firefighting populations in terms of extraversion. To further explore this significance, it must be determined whether this difference is common amongst various firefighter populations. This study seeks

to compare the levels of extraversion measured by the Big Five Inventory personality examination across different populations of firefighters. Participants are to be obtained on a voluntary basis from various departments, both rural and urban, as well as volunteer and paid. The populations include both male and female participants that range in age from eighteen to seventy years of age. Participants are to be given a four page printed questionnaire that will be scored upon completion. From the scores, a mean score for extraversion will determined and compared between populations. Different comparison groups will include female versus male populations, rural firefighters versus urban firefighters, paid firefighters versus volunteer firefighters, etc.

Number 3
Authors: Moses Bol
Year:
School: School of Nursing
Faculty Advisor:
Title:
Abstract:

Number 4
Authors: Monica Harold
Year: Senior
School: McAnulty College and Graduate School of Liberal Arts
Faculty Advisor: Judy Suh, PhD
Title: Stranger at Home: A Question of Identity in Cuban and African-American Poetry

Abstract:

I propose a comparative study of specific twentieth-century Cuban and African-American writers that attempted reclaim their African heritage and incorporate it into their cultural identities. These writers characteristically use onomatopoeic words to linguistically capture the cultural rhythms of their environments in an effort to create a synthesis between their African and present cultural identities. The Latin American writer I choose to examine is, Nicolas Guillèn, who is the best representative of *poesía negra* (black poetry) of the twentieth century. Guillèn's themes carefully navigate the seeming simple social complexities of ethnic blending and the resulting transculturation of Cuba's identity. Guillèn through his poetry attributes the current manifestations of Cuba's race related conflicts to the unresolved legacy of the slave dynamic and the unresolved encounters between egomaniacal prejudice and the unquenched aspirations of the ruled. I would then like to compare the literary writings of Nicolas Guillèn to that of Langston Hughes during the Harlem Renaissance. Similar to Guillèn, Hughes' poetry carefully addresses the question of identity by wading through the myths, superstitions, and prejudices about Africa permeated by early American -Europeans and Christians; in an effort to restore the damages to the black identity caused by slavery. The initial focus of the comparative study is to question the monologic discourse of twentieth-century America, which suggests that there is a linear transition from slave to citizen. This perspective of black modernity ignores the shared themes of depthless alienation: from oneself and one's people, that are permeated throughout the African diaspora. Latter approaches to African diasporic studies supports the theory that the sense of social authenticity gained through the idea of American superiority, has both excluded Black Americans from American society; yet, has also propelled the struggle of Black Americans into a position of dominance over other black movements. In other words, the U.S.-centric perspective collapses the African Diaspora in a singular conception of diaspora and renders other dialogues invisible. The complex position of Black Americans within the diaspora jeopardizes the seemingly idyllic connection between blacks in the transatlantic world. Rather, the transition from slave to citizen is a non-linear progression, marked with up-swings that create a sense of inclusion and down-swings that reflected the

instability of black citizenship. This inquiry further implies the collaboration between Guillèn and Hughes represents a relative un-autonomous form of discourse that challenges the monologic discourse of twentieth-century and allows for the critical re-accentuation of previous scholarship; which fails to accurately assess, how their mutual search for identity and an affirmation of their African heritage mirrors the colonial institution that permeated their initial search for self. Although, the transnational relationship between Hughes and Guillèn inadvertently, amidst their attempts to synthesize a working relationship between their two communities, rendered Guillèn's dialogue invisible. I further argue that the transatlantic interpretation of their work and its desired move away from a U.S.-centric interpretation creates a dialectical argument which suggests the inevitability of Hughes, as a U.S. writer, replicating notions of racial difference in his encounters with members of black community outside of the United States. Essentially, the theoretical interpretation of the Atlantic world naturalizes the consequences caused by a sense of homelessness that is permeated throughout the Black Atlantic . Rather than naturalizing the idea of American superiority: cultural, social, identity and historical, I choose to further explore the paradox of the American writer and how it characteristically represents the notions of American superiority. My research will further support the claim that, once examined it is evident that these allusions to superiority merely obscure an indescribable complexity of tensions that reflect the unfixed nature of American society.

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| Number | 5 |
| Authors: | John W. Heisler IV |
| Year: | Senior |
| School: | A.J. Palumbo School of Business Administration |
| Faculty Advisor: | Amy Phelps, PhD |
| Title: | A Survey Analysis of the Relationships between Economic News and Consumer Behavior |

Abstract: The news media affects consumer attitudes by processing and relaying relevant social, political, and economic information. Through an experimental survey designed to capture consumer sentiment and expectations, this paper provides insight into the direct effects of economic news on these variables. Furthermore, this research examines how modified expectations affect consumption decisions in a simulated purchase environment. Results indicate a relationship between the economic news participants receive and individual measures of consumer expectations; yet, survey results suggest only a marginal, non-significant relationship between sentiment and economic news. The data also shows that a relationship exists between consumer sentiment and purchase decisions in a simulated durable goods market. However, survey results do not suggest a correlation between economic news and consumer purchase decisions.

Number 6

Authors: Frank Marano Jr.

Year: Senior

School: A.J. Palumbo School of Business Administration

Faculty Advisor: Mark Gillis, PhD; Pinar Geylani, PhD

Title: Is There a Connection Between Single Parent Children and Crime?

Abstract: Prior research indicates that the legalization of abortion through Roe v. Wade has had a significant impact on the decline of the crime rate beginning in the 1990s. It is widely assumed that the majority of women seeking abortions are extremely similar to single mothers. Most are uneducated, poor, and young. In this paper, I examine multiple variables, including the amount of children living in a single mother household, and their relationship to crime rates. I attempt to bridge the gap between aborted children and those living in single parent households and conclude whether or not the majority of these aborted children, had they not been aborted, would have a positive impact on the crime rate.

Number 7

Authors: Margaret Jackson, Chelsea Hancock, Andrea Krestos

Year: Senior

School: School of Nursing

Faculty Advisor: Melanie Turk, PhD, RN

Title: What is the Impact of Tele-health in Decreasing Hospitalization for Congestive Heart Failure Patients?

Abstract: Traditional healthcare delivery usually requires the face-to-face interaction between the patient and healthcare professional, but with Telehealth capabilities arising, more opportunities are available to shorten lengths of hospitalizations and prevent re-hospitalizations. Telehealth is the use of telecommunication technology to deliver health-related services and information via videoconferencing between providers and patients. We conducted a review of research articles related to Telehealth. Our research question was, “What is the Impact of Telehealth in Decreasing Hospitalization for Congestive Heart Failure Patients?” Through our review of the research on Telehealth and congestive heart failure patients, we have found significant evidence that supports the use of Telehealth in the home care setting in the efforts to shorten a patient’s stay in the hospital and increase the successful attempts to decrease re-hospitalization. We have found through our review of research that utilizing telehealth can increase a patient’s access to care and decrease re-hospitalization.

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| Number | 8 |
| Authors: | Kate Armstrong, Nicole Bachman |
| Year: | Senior |
| School: | School of Nursing |
| Faculty Advisor: | Melanie Turk, PhD, RN |
| Title: | Nursing Care to Prevent Post Operative Pulmonary Complications |
| Abstract: | <p>Nursing Care to Prevent Post Operative Pulmonary Complications Nursing measures can make significant differences in the outcomes of post-operative patients, and preventing post-operative pulmonary complications is vital to the patient's well-being and health. This research paper aims to answer the question: What are effective nursing interventions in caring for post-surgical patients to prevent pulmonary complications? Through the research reviewed, we found that simple measures such as patient teaching, changing body positions, and mobilization are primary nursing interventions to prevent pulmonary complications. Incentive spirometry use, encouraged by the nurses, was shown to greatly decrease the incidence of post-operative pulmonary complications, as did pain management, cough/deep breathing techniques, early mobilization and use of CPAP with oxygen. Early pain recognition and management are imperative to early mobilization and the prevention of post-operative pulmonary complications. The use of incentive spirometry should be taught prior to surgical procedures to help promote post-operative compliance. Following these research-based preventative measures will greatly improve patient outcomes.</p> |

Number **9**

Authors: Carolynne Kimball

Year:

School: McAnulty College and Graduate School of Liberal Arts

Faculty Advisor:

Title:

Abstract:

Number **10**

Authors: Michael Zalakar

Year:

School: Mylan School of Pharmacy

Faculty Advisor:

Title:

Abstract:

| | |
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| Number | 11 |
| Authors: | Ashley B. Biernesser, William T. Eckenhoff, Tomislav Pintauer |
| Year: | Sophomore |
| School: | Bayer School of Natural and Environmental Sciences |
| Faculty Advisor: | Tomislav Pintauer, PhD |
| Title: | The use of nitrogen and phosphorus containing ligands for iron catalyzed atom transfer radical addition |
| Abstract: | <p>The process of atom transfer radical addition (ATRA) is a fundamental reaction used to add halogenated compounds across carbon-carbon double bonds by a radical process. It is typically catalyzed by a transition metal/halide complex in a redox cycle. Using small amounts of a reducing agent, such as a free radical initiator, the catalyst can be regenerated which allows for a significant decrease in the amount of catalyst required for ATRA. Although this methodology has been highly effective for copper and ruthenium mediated ATRA, iron catalyzed ATRA in the presence of reducing agents has not been explored to a great extent. Iron(III) complexes with nitrogen and phosphorus based ligands were investigated as catalysts for ATRA in the presence of free-radical diazo initiator 2,2'-azobisisobutyronitrile (AIBN). TONs as high as 640 were achieved for the addition of polyhalogenated compounds to various olefins. In addition, structural aspects of these complexes were investigated.</p> |

Number 12

Authors: Antonette Cabauatan and Stephanie Wetzel

Year: Junior

School: Bayer School of Natural and Environmental Sciences

Faculty Advisor: Stephanie Wetzel, PhD

Title: GC/MS Comparison of Synthetic Fiber Polymer Additives in Carpets

Abstract: Polymers are long-chained molecules which are compounded with additives which chemically modifies the polymers in order to improve their performance 1 . Additives were extracted from nine different carpets (made of nylon, polypropylene, or olefin) and subjected to analysis through GC/MS. It was found that where you choose to take a sample does not affect the outlook of the chromatograms. While the intensities of certain peaks may differ from one area over another area of the same carpet, these minor differences are insignificant in interpretation. Differences were found between the nine carpets suggesting that nylon (or any other polymer) made from one manufacturer is different from nylon that is made from another manufacturer.

Number 13

Authors: Katherine Gorton

Year: Senior

School: McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Russ Walsh, PhD

Title: Education's Gender War

Abstract: From research and observation at the Arsenal Center this semester, it is an easy conclusion that there are many things that go in to the healthy development of gender identities

in young children. The teachers are an integral part of that process, along with the parents, the structure of the education system itself, and interaction with peers. While all of these factors contribute to personal development, when it comes down to hands on education for children, the teachers are the people who will inevitably guide and shape the young minds in their care. They have the power to change the way children see themselves and their peers positively. I propose, based on my research and observations, that teachers directly and greatly influence how children view gender in every interaction. Because of this influence there is currently a struggle to find a balance in teaching methods that will benefit each gender equally. The research I have done shows that this balance is necessary for an equally balanced development of gender identity in children.

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| Number | 14 |
| Authors: | Dominik Beer |
| Year: | Senior |
| School: | Bayer School of Natural and Environmental Sciences |
| Faculty Advisor: | Richard Elinson, PhD |
| Title: | The role of ectoderm/mesenchyme interactions on limb bud development |
| Abstract: | Most amphibians develop from tadpoles to frogs through metamorphosis. <i>Eleutherodactylus coqui</i> does not follow this path but is instead a direct developer. One of the most notable differences observed in <i>coqui</i> development compared to tadpole development is the early formation of limb buds. We hypothesize that the large limb development in <i>coqui</i> is due to interactions between the ectoderm and mesenchyme. A series of cross species ectoderm transplantations were carried out to see if embryonic ectoderm from a tadpole species could support rapid limb growth. Successful xenotransplantations were executed by replacing <i>coqui</i> limb ectoderm with <i>Rana</i> |

flank ectoderm and early stage *Xenopus* ectoderm. The foreign ectoderm successfully integrated with the coqui limb mesoderm but did not grow with the embryo and subsequently fell off the host limb. The transplantation techniques are being improved empirically and more comprehensive surgeries are planned.

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| Number | 15 |
| Authors: | Suzanne Daghestani, OTS, Emily Syzmanski, OTS & Jaime Munoz, PhD, OTR/L, FAOTA |
| Year: | Senior |
| School: | Rangos School of Health Sciences |
| Faculty Advisor: | Jaime Munoz, PhD |
| Title: | Goal Setting: Comparison of the COPM and KAWA |
| Abstract: | Working in collaboration with community-based practitioners, Munoz and colleagues modified the Canadian Occupational Performance Measure (COPM) in an attempt to support more culturally responsive assessment and intervention processes. Practitioners had reported that the COPM was a useful evaluation tool, but that clients frequently identified occupational performance problems or goals that were outside the COPM's three primary areas of self-care, leisure, and productivity. The KAWA Model is a recently developed approach that may elicit a more complete understanding of contextual factors which influence occupational performance. The primary research questions that will guide this study is: How does the range of problems identified in the KAWA River Model compare to the range of problems identified using the COPM with the Homeless Population? Secondary research questions will also examine the effectiveness of this assessment measure for eliciting useful data that can be used in individual treatment and community reintegration planning. The secondary research questions that will be in this study are: How do the women at Bethlehem Haven self-define problems of occupational performance using the |

KAWA River Model and the COPM? How do the women at Bethlehem Haven self-define environmental supports and barriers that impact their occupational functioning using the KAWA River Model and the COPM? Are there differences in the range and/or pattern of occupational performance problems identified using the KAWA River Model when compared to problems identified using the COPM? Are there differences in the range and/or pattern of environmental supports and barriers identified using the KAWA River Model when compared to problems identified using the COPM?

Number **16**

Authors: Catherine Fallon

Year: Senior

School: A.J. Palumbo School of Business Administration

Faculty Advisor:

Title:

Abstract:

Number **17**

Authors: James Park

Year:

School: Mylan School of Pharmacy

Faculty Advisor:

Title:

Abstract:

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| Number | 18 |
| Authors: | Josh Koslosky |
| Year: | Junior |
| School: | McAnulty College and Graduate School of Liberal Arts |
| Faculty Advisor: | Stacey Levine, PhD |
| Title: | Image Denoising Via Feature-Based Sparse and Redundant Dictionaries |
| Abstract: | <p>In recent years the computer vision community has demonstrated that sparse and redundant representations of image patches can be used to denoise images. These representations can be formed using dictionaries that are either fixed (e.g. Discrete Cosine Transform) or learned from the noisy data itself. Finding the best patch representation leads to a constrained optimization problem, which depending on its formulation can be nonconvex. Elad and Aharon propose such a model which learns the dictionary from the noisy data, which they solve using Orthogonal Matching Pursuit and K-SVD (a modification of the Singular Value Decomposition inspired by K-means). In this talk we propose a modification of their algorithm in which dictionaries can be tailored to denoise smooth regions, textured regions, and edges separately. In particular, we discuss several approaches for segmenting an image based on these different geometric properties, and how dictionaries tailored to these properties can improve both the image representation and denoising.</p> |

Number 19

Authors: William P. Lewis

Year: Senior

School: A.J. Palumbo School of Business Administration

Faculty Advisor: Pavel Yakovlev, PhD

Title: THE IMPACT OF LEGISLATIVE TERM LIMITS ON STATE FISCAL POLICY

Abstract: Proposal Description: At a time when the American public was becoming increasingly frustrated with its government leaders, legislative term limits were popularized as a solution to various shortcomings in the American political system. Proponents of term limits argue that when politicians are permitted to run for reelection indefinitely they develop an incumbency advantage which distances them from the voters and obstructs the efficient operation of political markets. The expectation is that voters' interests will be better represented if elected officials are limited to two or three terms in office. Since 1990, fifteen states have adopted legislative term limits. At the time of their passage, legislative term limits were virtually an untested experiment. Prior to 1990, it was common practice to impose term limits on the executive office, but never before had a state legislature been subject to this constraint. Almost two decades later the impact of legislative term limits is becoming evident on a number of fronts. While previous research has focused on the behavioral and institutional changes that term limits have brought to state legislatures, little analysis has been done on the policy outcomes associated with the adoption of legislative term limits. The focus of this paper is to explore the relationship between term limits and fiscal policy outcomes. Specifically, we examine how the rent-optimizing calculus of a term limited legislator might lead the lawmaker to favor one fiscal policy over another. We argue that the shorter political time horizon that term limits impose on legislators will cause legislators to favor fiscal policies that have short-term political payoffs. Specifically, this entails higher expenditure levels on social programs which are easily implemented in the short-run; and conversely, lower expenditure levels on long-term projects

such as infrastructure spending. We find that that term limits reduce levels of state infrastructure spending relative to public welfare expenditures, such that term limits create a substitution effect between these two expenditure items.

Number 20

Authors: Karlie O'Malley

Year: Senior

School: A.J. Palumbo School of Business Administration

Faculty Advisor: Antony Davies, PhD

Title: Do Psychological Cues Alter Our Discount Function?

Abstract: Previous psychology research has found that people respond to cue-based (i.e. visceral or instinctual) drives, which include hunger, thirst, sexual desire, pain, and fear, and that these cues influence our need for immediate gratification. These cue-based drives alter the extent to which we value rewards received at different time horizons. Economists have suggested that cue-based drives can alter a person's subjective discounting mechanism, making it deviate from the exponential discount model. In this paper, I test the effect of a sexual stimulus on subjective discounting through a set of controlled experiments. I find that, in the presence of sexual stimuli, subjects' subjective discount rates become functions of time. When faced with a near future reward, subjects exhibit a greater discount rate, but when faced with the same reward in the far future, subjects exhibit a lesser discount rate. This is contrary to the traditional exponential discounting model, which assumes that the discount rate is constant with respect to time.

Number 21

Authors: Andrea Pfalzgraf, MPH, PhD, Maura Schwab, PharmD Candidate

Year: Senior

School: Mylan School of Pharmacy

Faculty Advisor: Andrea Pfalzgraf, MPH, PhD

Title: Pediatricians' Self-Reported Treatment and Pharmacotherapy Monitoring of Children and Adolescents with Major Depressive Disorder

Abstract: Major depressive disorder (MDD) in children and adolescents is a serious public health problem in the U.S. There are risks associated with untreated MDD. Children and adolescents with MDD have a greater risk for drug abuse, difficulties in school, impaired functioning, and even suicide. Given there are serious consequences associated with this disorder, treatment of children and adolescents with this MDD, becomes crucial. Unfortunately, there is a shortage of child psychiatrists in the U.S. to treat these patients. Many children and adolescents with MDD receive treatment from pediatricians. Pediatricians, however, do not obtain the extensive training child psychiatrists receive to treat children and adolescents with MDD. Since this is the case this study will determine how pediatricians in the OH, PA, and WV treat and monitor children and/or adolescents with MDD and compare the findings with current U.S. FDA guidelines and AACAP recommendations.**OBJECTIVES:** 1. Determine pediatricians' preferred treatment for children and adolescents with MDD, 2. Determine how pediatricians monitor children and adolescents with MDD who are treated with antidepressant therapy, and 3. Compare pediatricians' treatment and monitoring behaviors to the current U.S. FDA guidelines and AACAP recommendations.**METHODS:** The pediatricians in a national physician database, who practice in OH, PA,

and WV will serve as the sample for the current study (n = 3,146). This study will utilize survey methodology. Data will be collected via two survey mailings. The survey utilized in this study will consist of four sections and the questions are designed to obtain information about prescribing habits to newly diagnosed children and adolescents with MDD. A pilot study will be conducted to evaluate the clarity of the survey instrument. The pilot study will consist of a random sample equal to 10% (or 315 subjects) of the total sample size. **OUTCOMES:** Pediatricians' self-reported treatment and pharmacotherapy monitoring of children and/or adolescents with MDD will be reported and compared to current treatment and monitoring guidelines. The data obtained from this study will be utilized to develop a larger, national study to determine treatment and monitoring preferences among pediatricians for children and adolescents with MDD.

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| Number | 22 |
| Authors: | Jason Vigneault |
| Year: | Senior |
| School: | A.J. Palumbo School of Business Administration |
| Faculty Advisor: | Matthew Marlin, PhD |
| Title: | The 2009 Car Allowance Rebate System: An Analysis of the Change in Gasoline Consumption |
| Abstract: | This thesis focuses on the effect of the 2009 Car Allowance Rebate System, an accelerated vehicle scrappage program, on gasoline consumption. The program raised the fuel economy of the vehicle fleet by replacing approximately 700,000 vehicles with newly purchased vehicles at a cost to taxpayers of \$3 billion. The results indicate that the 2009 Car Allowance Rebate System will not significantly reduce gasoline consumption in the U.S. The estimates of change in gasoline consumption from this analysis form a basis for evaluating future policy and research regarding vehicle scrappage programs in the U.S. |

Number 23

Authors: Timothy Rothhaar

Year: Junior

School: McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Sarah MacMillen, PhD

Title: The Outcast Individual: Abraham and Affliction in the Broader Society

Abstract: The alienation of the individual can take on any number of forms in a society, for any number of reasons. One such way is through what philosopher Søren Kierkegaard calls the teleological suspension of the ethical, which is the putting aside of communal morality in favor of a higher purpose in an individual's life. The point of this paper will be to describe, compare, and contrast the teleological suspension of the ethical realm as found in Kierkegaard's exposition on the story of Abraham and Isaac in his book *Fear and Trembling*, with philosopher Simone Weil's understanding of affliction, found in her essay *The Love of God and Affliction*. It will analyze Kierkegaard's three spheres of existence in relationship to the suspension of the ethical, explain how the individual relates to the ethical and religious spheres, as well as affliction, and showcase similarities between the two.

Number 24

Authors: Jason T. Hunt

Year: Junior

School: McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Dr. Charles Rubin, PhD; Clifford Bob, PhD

Title: Serve to Rule or Rule to Serve? An Analysis of Congressional Casework

Abstract: Is congressional constituency service an important aspect of legislators' jobs, or merely vote-buying and favoritism repackaged for a modern constituency? Since the congressional constituency service of casework can look remarkably like congressmen simply doing favors for constituents, it is only logical to wonder if this process is a healthy one. This paper will review the position which casework occupies in the modern American political system by analyzing all three of the major purposes that political scholars attribute to casework: its ability to affect electoral outcomes, its ability to help members better perform other aspects of their jobs, and its role as an appeals process for those who have problems with the federal bureaucracy. In this research paper, I use my own experience working in a constituency service office as a plausibility probe to shed light on scholarly theories about constituency service. Analyzing both primary materials gathered during my internship and secondary research sources, I conclude that casework is an important part of a legislator's duties: In return for performing an important and necessary function for their constituents, congressmen gain a tool that may be used to increase positive exposure to their constituents, and that may also help them in better performing other aspects of their job, such as oversight.

Number 25

Authors: Matthew Wollenschlaeger

Year: Junior

School: Bayer School of Natural and Environmental Sciences

Faculty Advisor: Stephanie Wetzel, PhD

Title: GC-MS Analysis of Hair Care Products for the Identification of Hair Evidence

Abstract: Current methods of identifying hair from a crime scene include microscopic observation and the use of DNA tags, if the root is intact. Such methods are subjective or are not always possible. The lack of objective and consistent methods for the identification of hair samples collected as evidence demonstrates the need for development of additional methods of identification. In this project, different shampoo and conditioner samples, as well as a mixture of product samples will be analyzed to determine if it is possible to differentiate between such products. This will be achieved through Gas Chromatography- Mass Spectroscopy.

Number 26

Authors: Amanda George

Year:

School: Mylan School of Pharmacy

Faculty Advisor:

Title:

Abstract:

Number 27

Authors: Blake Plavchak

Year: Senior

School: McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Erik Garrett, PhD

Title: “The Shift From Print Based Rhetorical Discourse To Image Based Discourse”

Abstract:

The Essay being submitted explores the transition of rhetorical discourse from one based primarily in print to one that takes place in the form of images. The essay explores this concept by tracing the technological innovations that have spurred this evolution. The type of discourse that takes place in a print based age and the type of discourse that takes place in an ocular society are examined and examples of each type of discourse are given and examined. The main focus of the essay is the examination of how the separate forms of discourse impact human society and the quality and amount of action taken as a result of the rhetoric. The essay also examines the forms and content quality of both print and ocular rhetoric. The essay is a good starting point for what will become a larger examination of technology and its impact on society and public discourse. Here is the first page of the paper. This essay will try to establish that our current tradition of discourse has transitioned from a culture of print to a culture of images and representations. To do this, this essay will rely on an understanding of current rhetorical discourse as taking place increasingly more often on television and will try to establish the movement of the public forum from actually being in public to being on television. This essay will briefly explain the transition of human culture from one of a highly oral tradition of discourse to one of print and now of representational imagery, or ocular representation. After a basis has been established showing that our culture has transitioned away from print the effects of this transition will be explored. To begin with, it is important to understand that many of our greatest thinkers lived and worked in a time when discourse was done primarily through speech. Ancient thinkers such as Plato, Aristotle and Cicero lived in a time when communication took place in the public sphere. How a speaker was addressing an audience, through epideictic, forensic or deliberative forms of speech didn't matter. The speech act was done mostly in public and strictly from memory. This tradition carried on for many centuries until the invention of the printing press. The printing press allowed for a text to be communicated to a larger public. Walter Ong characterizes the shift from oral based communication to print based communication as a shift from sound to visual space (Ong). Important to understand is that the shift to print based communication did not completely do away with the oral tradition. The world after

the printing press was still the world. This new technology brought about many shifts in culture but it did not get rid of culture.

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| Number | 28 |
| Authors: | Matthew J.W. Taylor, Tomislav Pintauer |
| Year: | Junior |
| School: | Bayer School of Natural and Environmental Sciences |
| Faculty Advisor: | Tomislav Pintauer, PhD |
| Title: | Enhancing green methodologies for copper catalyzed atom transfer radical addition |
| Abstract: | <p>In recent years, copper-catalyzed atom transfer radical addition (ATRA) has emerged as a viable organic procedure for the synthesis of carbon-carbon bonds. Already a fundamentally “green” chemical process, the versatility of these reactions allows for further optimization to decrease environmental impact: (1) studies have primarily focused on the use of radical initiators to regenerate the activator species; however, these initiators lead to radical termination reactions and repeated additions to form polymers and oligomers. In this study, the non-radical reducing agent ascorbic acid (Vitamin C) was effectively employed,(2) ambient temperature reactions were examined at catalyst loadings well below historically required levels, (3) Solid-supported catalysis will be paired with catalyst regeneration techniques to provide an economical and more environmentally-benign synthetic process.</p> |

Number 29

Authors: Sean Noonan, William Eckenhoff, Tomislav Pintauer

Year: Junior

School: Bayer School of Natural and Environmental Sciences

Faculty Advisor: Tomislav Pintauer, PhD

Title: Investigating Atom Transfer Radical Addition in the Presence of Triethylborane (Et₃B)

Abstract: Atom Transfer Radical Addition (ATRA) was first developed in the early 1940's with the addition of polyhalogenated compounds to alkenes. Typically these reactions were catalyzed using metal complexes; however, relatively large amounts of catalyst were needed (10-30mol%). The solution to this problem for copper mediated ATRA has been found through using free radical initiators such as 2,2'-azobis(2-methylpropionitrile) or AIBN. This work extends to the use of free radical initiator Triethylborane (Et₃B) and addition of various alkyl halides. Et₃B has shown to produce efficient yields for the addition of certain alkyl halides compared to other free radical initiators. Normally ATRA is air sensitive but considering Et₃B consumes oxygen to produce the necessary radicals oxygen is no longer a problem. Since this decomposition of Et₃B is not temperature dependent low temperature ATRA is possible. This work also includes some kinetic studies done using Et₃B as the free radical initiator.

Number 30

Authors: John Pulito

Year: Senior

School: A.J. Palumbo School of Business Administration

Faculty Advisor: Antony Davies, PhD

Title: Does Government Regulation of Alcohol have an Effect on Alcohol-Related Traffic Fatalities--A Panel Data Analysis of the United States between 1982 and 2002.

Abstract: The 21st amendment gave states the power to regulate, sell, and distribute alcohol. To date, nineteen states have opted for control. Previous research has examined the effects of state regulation on alcohol-related traffic fatalities, but has ignored the variations in the degree of regulation across states. This paper presents a panel study of 50 states from 1982 to 2002 that measures the impact of the degree of alcohol control on the incidence of alcohol-related traffic fatalities. Utilizing a fixed-effects vector decomposition with panel-corrected standard errors procedure, the results suggest that as a whole, control states experience significantly more alcohol-related traffic fatalities compared to states which do not regulate alcohol. Aside from states which regulate alcohol at the wholesale level, the varying degree of control does not appear to have a significant effect on those who are 21 or older. More daunting, though, are the estimates which suggest that any form of government control on alcohol results in an increase in alcohol-related traffic fatalities for those who are under the age of 21.

Number 31

Authors: Amanda Sgroi

Year: Senior

School: McAnulty College and Graduate School of Liberal Arts

Faculty Advisor: Stacey Levine, PhD

Title: Texture Analysis as a Technique in Support of Image Denoising

Abstract: Texture analysis has become a widely explored problem in image processing due to its vast applications, for instance, image denoising, inpainting, and object recognition. In the case of image denoising, texture analysis can be used to more accurately remove noise depending on the varying

complexity within an image. In this talk I will discuss two algorithms we have developed that use texture analysis in this way. The first is a perceptually adaptive version of bilateral filtering, which uses the variations in texture to separate regions, analyze the distinctions between textures contained in various regions, and remove noise throughout the image based on these findings. This method also uses Daly's Visual Difference Predictor which visualizes the spatial frequencies processed by the amplitude-nonlinearity function in the frequency domain, in relation to various orientation decompositions. The second algorithm, which denoises using sparse dictionary representations, uses tools such as entropy, canny edge detection with human texture analysis input, and a combination of morphological operations in conjunction with statistical information for texture analysis to separate the image for the multiple dictionaries. Although these techniques vary in application, their implementations contain many similarities, which can be applied to other areas in image processing.

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| Number | 32 |
| Authors: | Peter J. Horne |
| Year: | Senior |
| School: | A.J. Palumbo School of Business Administration |
| Faculty Advisor: | Mark Gillis, PhD, Antony Davies, PhD |
| Title: | Forecasting's Final Destination: How Well Can Individuals Predict their own Deaths? |
| Abstract: | This paper analyzes individuals' probability expectations of living to the age of 75 using survey data from the Health and Retirement Study. Preliminary specifications find that these expectations are consistent with actual personal mortality risks and also are predictors of an individual's survival. The results also suggest that individuals are, on average, slightly pessimistic in the formulation of such expectations, suggesting the possibility of irrationality in forming longevity expectations. Finally, an examination of |

the mean deviation in individuals' forecast errors indicates that individuals miscalculate the probability of surviving to age of 75 by an average of about 25 percentage points wherein individuals who survive ultimately estimate more closely than individuals who do not survive.

Number 33

Authors: Mary Katherine Sasinoski, Chloe Weisburg, Khristian-Erich Bauer-Rowe Ramos, Jennifer Wu

Year: Freshman

School: Mylan School of Pharmacy

Faculty Advisor:

Title: The Ability of C5 Protein to Restore Catalytic Function in Mutated RNase P

Abstract: RNase P is a ribonucleoprotein that catalyzes the hydrolysis of 5' leader sequence of pre-tRNA. Although P RNA has the ability to catalyze reactions at high magnesium concentrations, the cofactor P protein is required for in vivo catalysis. Studies have shown that the P protein is involved in substrate binding, metal ion affinity, stability of RNA conformation, and catalytic rate enhancement. In this experiment, we demonstrate the importance of holoenzyme complex in E. coli RNase P by using polymerase chain reaction to mutate the A361 site to T in P RNA (which is believed to be directly involved in catalysis) and adding C5 protein to see if it compensates for the mutation at 50mM and 17.5mM MgCl₂. The results show that addition of the C5 protein does compensate somewhat for the mutation, indicating that it may be involved in structural stability.

Number 34

Authors: Mario Basara

Year:

School: A.J. Palumbo School of Business Administration

Faculty Advisor:

Title:

Abstract:

Number 35

Authors: Jacqueline Bliley, Caitlin Feth, and Dr. Sarah Woodley

Year: Senior

School: Rangos School of Health Sciences

Faculty Advisor: Sarah Woodley, PhD

Title: Acute Stress Response as an Adaptive Mechanism in Salamanders

Abstract: Acute Stress Response as an Adaptive Mechanism in Salamanders
Vertebrates express a suite of physiological and behavioral responses to stressors. The stress response is thought to be beneficial in the short term, but becomes detrimental when expressed long-term. This response is believed to promote survival behaviors while also suppressing non-essential functions such as mating. Therefore, an acute stress response would suppress mating and decrease locomotory activity as a form of adaptation. In experiment one; activity was analyzed immediately following an acute stress response for 4 hours. A dramatic decrease in activity was seen in stressed salamanders as compared to their non-stressed counterparts for up to 3 hours. In experiment two, *D. ochrophaeus* salamanders were subjected to capture stress and their response was recorded for a period of 5 hours. No difference was found

in activity or mating levels between captured and non-captured salamanders. The acute stress response appears to be a beneficial adaptive mechanism.

Number 36

Authors: Kristine Deibler and Partha Basu

Year: Sophomore

School: Bayer School of Natural and Environmental Sciences

Faculty Advisor: Partha Basu, PhD

Title: The Synthesis and Characterization of Leadglow and the Molybdenum Complex

Abstract: Lead toxicity is one of the most common environmental concerns in the United States, as it can affect almost every soft tissue in the body, especially in children. The Center for Disease Control has recently set a new goal to eliminate blood lead levels in children by 2010. In order to accomplish that goal lead must be able to be detected at small amounts. The current methods for the detection of lead are highly instrumentally intensive. A fluorescent molecule, 4,4-dimethyl-4H-5-oxa-1,3dithia-6,11-diazacyclopenta[*a*]anthracen-2-one, patented as Leadglow, has been found to act as a selective and sensitive fluorescent lead sensor. This method of lead detection has been found to be comparable to several of the currently used methods of detection. Here we discuss the synthesis of Leadglow and its spectroscopic characterization. The synthesis of the Molybdenum Complex is also shown. Since lead toxicity is the most common environmental disease in the United States, [1] it is important to be able to detect lead at small amounts in an aqueous environment. The current methods of detection involve advanced equipment and can only measure total lead content. [1] Fluorescent based sensors have been of interest for their sensitivity and simplicity. Leadglow has a thio-based binding site and lead being a soft metal favors sulfur rich binding sites. [3] Leadglow has been found to serve as a highly sensitive and selective

fluorescent lead sensor in an aqueous environment. Using this unique molecule the synthesis of the Molybdenum Complex has been developed. The Mo Complex is a key mimic to bodily molybdenum enzymes. He, Qiwen; Miller, Evan W.; Wong, Audrey P.; Chang, Christopher J., A selective fluorescent sensor for detecting lead in living cells. J. Am. Chem. Soc 2006 , 128, 9316-9317. Marbella, L.; Serli-Mitasev, B.; Basu, P.; Angewandte Chemie Int. Ed. Engl. 2009 , 48, 3996-3998. Magyar, J.S.; Weng, T.C.; Stern, C.M.; Dye, D.F.; Rous, B.W.; Payne, J.C.; Bridgewater, B.M.; Mijovilovich, A.; Parkin, G.; Zaleski, J.M.; Penner-Hahn, J.E.; Godwin, H.A. <i>J. Am. Chem. Soc. 2005, 127, 9495.

Number 37

Authors: Christina M. Orr

Year: Senior

School: A.J. Palumbo School of Business Administration

Faculty Advisor: Pavel Yakovlev, PhD

Title: Moral Hazard: The Relationship Between State Auto Insurance Coverage Minimums and Traffic Fatalities

Abstract: Prior research on moral hazard in auto insurance has examined the effect of compulsory insurance, no-fault liability, and tort liability on traffic fatalities. In contrast, this study is the first one to examine the same moral hazard in auto insurance using a different measure, state auto insurance minimum coverage requirements. Similar to previous research, this study finds the existence of moral hazard in auto insurance that leads to higher traffic fatalities. Namely, this study finds that states with higher auto insurance minimum coverage amounts have a higher rate of traffic fatalities. This result is especially relevant, as some states have recently enacted plans to double or raise their minimum coverage amounts in the immediate future.

Number 38

Authors: Maegan Gardner

Year:

School: Mylan School of Pharmacy

Faculty Advisor:

Title:

Abstract:

Number 39

Authors: Anthony G. Lucas

Year: Senior

School: A.J. Palumbo School of Business Administration

Faculty Advisor: Risa Kumazawa, PhD

Title: Retirees and Health Insurance: An Analysis of Their Private, Public and Out of Pocket Usage After They Migrate South

Abstract: Affordable health insurance for the elderly is a major concern for today's society. It is especially important now with the aging baby boomer population entering into the retiree market. As a result, the United States is going to have one of the biggest booms of this incoming particular population at one time. Moreover, we will be having more people entering society that will rely on a fixed income and losing many of their former employer benefits, including health insurance. Because of their new monetary restraints, many retirees will be considering options that will help lower their expenses in the most effective way. In recent years, retirees have made it a custom to travel and find new residences, especially to places of warmer climates. Rose and Kingma (1989) found that retirees are now leaving their homes in search of warmer and

sunnier climates to the South in places such as Florida. They have been given the nickname of “Snowbirds” for their behavior is similar to birds whose norm is to migrate south for the winter. The snowbirds have done this with hope that they will have the opportunity to begin the next chapter of their life with sunnier and healthier days ahead at their new homes. However, it has become more customary that the snowbirds have no longer made this journey temporary, but, rather choose to stay in the warmer climate indefinitely. The quality of retiree health and healthcare has been debated over the years. Arguments have been made both for and against retiree migration and predict there is an impact on health for retirees based on geographical climate and location. Specifically, there is criticism of the health care in the South. Regionally, Allison and Foster (2004) conclude the South has less aggregated health than the rest of the United States and is distributed unequally. Medicare, the government-funded health care plan for the elderly, age 65 and older, is available to society’s senior citizen population. Unfortunately, Medicare does not cover all health care expenditures. As a result, most individuals have become reliant on other private supplemental insurance plans and out of pocket expenses. The purpose of this paper is to examine retirees who migrate to the South to see if they are using less private insurance, public insurance and out of pocket expenses for healthcare then those who stay static.

References: Allison, R.A. & Foster, J.E., 2004. Measuring health inequality using qualitative data. *Journal of Health Economics*, 23: 505-524. Rose, L.S. & Kingma, H.L., 1989. Seasonal migration of retired persons: estimating its extent and its implications for the state of Florida. *Journal of Economic and Social Measurement*, 15: 91-104.

Number 40

Authors: Katelyn T. Boone, Brady A. Porter

Year: Senior

School: Bayer School of Natural and Environmental Sciences

Faculty Advisor: Brady Porter, PhD

Title: Characterization of Novel Pigments in *Etheostoma caeruleum* E. blennioides

Abstract: Unlike most other vertebrates, many darter species in the genus *Etheostoma* do not utilize structural refraction to display blue or green color. Instead, the blue and green mating coloration exhibited by male rainbow darters (*E. caeruleum*) and male greenside darters (*E. blennioides*) result from true chromoprotein pigments. Spectral absorption profiles indicate that pigments from these two species are similar, but not identical. The first goal of this study was to extract and purify the novel integument pigments produced by these fishes. Pigments were extracted from intact frozen specimens by performing multiple freeze/thaw cycles. Pigments were purified through a process consisting of gravity filtration, ammonium sulfate fractionation, size-exclusion chromatography, and preparative non-denaturing Polyacrylamide Gel Electrophoresis (PAGE). SDS PAGE was carried out to analyze the purity of the pigments after each purification step. The pigment from *E. caeruleum* was shown to be pure after the preparative non-denaturing PAGE. The next goal of this study is identification of the chromophore. This will be accomplished by first denaturing the pigment using either HCl or Urea in order to separate the chromophore from the hromoprotein. Next, the apoprotein will be removed using ammonium sulfate fractionation and phenol partitioning. Then the chromophore will be purified using Thin Layer Chromatography and analyzed using mass spectrophotometry, UV-VIS absorption spectroscopy, and fluorescence spectroscopy. Future work will involve

additional comparative biochemistry of the chromophore and protein sequencing of the apoprotein.

Number 41

Authors: James Brancho, Jeffry D. Madura

Year: Junior

School: Bayer School of Natural and Environmental Sciences

Faculty Advisor: Jeffry D. Madura, PhD

Title: Cocaine Interactions with Dopamine Transporter Proteins

Abstract: Millions of people are affected by cocaine addiction and overdose, yet knowledge of the mechanism by which cocaine functions is limited. It is known that cocaine binds to the plaslemmal dopamine transporter protein (DAT) and inhibits dopamine reuptake from the synaptic cleft. It is hypothesized that cocaine binds to a DAT in a binding pocket near valine residue 152. To test this hypothesis we have developed topology and parameter files for cocaine were developed according to CHARMM force-field specifications. The force-field was tested using NAMD 2.7. Cocaine was docked to DAT at the hypothesized binding site using MOE 2008. The complex was minimized in vacuum for 5 picoseconds using NAMD. The force-field parameters along with initial molecular simulation results will be presented.

Number 42

Authors: Jonathon D. Gibbons, Kalyan Immadisetty, Jeffry D. Madura

Year: Junior

School: Bayer School of Natural and Environmental Sciences

Faculty Advisor: Jeffry D. Madura, PhD

Title: Parameterization of Desipramine, Imipramine, and Clomipramine

Abstract: Antidepressants, narcotics, and other types of mood altering drugs bind to the dopamine active transporter (DAT). Certain molecules, like cocaine, block dopamine re-uptake from the synaptic cleft. This causes an excess of dopamine to remain in the synaptic cleft, which can lead to euphoric like feelings. How and why specific molecules bind to and inhibit DAT is of high pharmacological interest. In order to determine how molecules bind, parameterization efforts for tricyclic antidepressants such as desipramine, clomipramine, and imipramine have been undertaken. However, due to their charged states, parameterization has been a tedious and difficult task. Alterations for the tail end nitrogen and the corresponding proton were necessary to correctly model the partial charges. Free energies of hydration calculations and studies in protein for each drug were performed to validate the accuracy of the charges by comparing theoretical structure to experimental structure

Number 43

Authors: Molly Lurie-Marino, Michael Jensen-Seaman

Year: Junior

School: Bayer School of Natural and Environmental Sciences

Faculty Advisor: Michael Jensen-Seaman, PhD

Title: Investigating the presence of numts in Gorilla gorilla

Abstract: In my research with Dr. Seaman I have attempted to pinpoint which known Gorilla numts are polymorphic and which are ubiquitous. Numts, or nuclear mitochondrial DNA, are pieces of DNA that have migrated at some point in evolutionary history from the mitochondria to the nucleus. By identifying where these numts are and who has them we can, in future research, be able to discover when evolutionary patterns actually happened throughout history. Through steps including PCR, purification, sequencing, and analysis I discovered which numts I tested for were present in the homozygous or heterozygous form, if at all. Currently I am attempting, along with others, to fully analyze an individual's DNA for numts by purifying pure mitochondrial DNA for examination. Through multiple steps of digestion, ligation, and amplification, the DNA can eventually be sequenced in parts and analyzed to complete an individual analysis.

Number 44

Authors: Roberta Diller, Brady Porter, Nancy Trun

Year: Senior

School: Bayer School of Natural and Environmental Sciences

Faculty Advisor: Nancy Trun, PhD

Title: Examination of the Bacterial Composition of Murphy's Bottom Wetland Before, During and After Restoration

Abstract: Murphy's Bottom is currently an area isolated from the Allegheny River, upriver from the City of Pittsburgh. It contains a small lake that was used for gravel mining. The area is being restored as a wetland and will be opened to the river. As part of the Murphy's Bottom Ecological Project, this long-term study will focus on identification of bacteria that are present in sediment samples from several sites; before, during and after restoration. Samples of sediment measuring approximately 40 cm x 4 cm were removed from several sites from Murphy's Bottom. Differential centrifugation was used to collect the bacterial-sized cells from each sample. DNA was extracted using a silica-based procedure. Primers matching the 16S rRNA and the 23S rRNA bacterial genes were used to amplify, by PCR, a section of the bacterial chromosomes present. These fragments from the bacterial chromosomes were cloned and sequenced in order to identify the bacteria present. These procedures will be repeated on samples from different seasons throughout the restoration. The data will be compared with regard to seasonal changes and sample locations. Sampling subsequent to the riverbank modification could aid in further research to determine the environmental impact.

Number 45

Authors: Kevin Mark Baldini

Year: Senior

School: A.J. Palumbo School of Business Administration

Faculty Advisor: Mark Gillis, PhD; and Matt Ryan, PhD

Title: Does Relief Pitching Increase the Number of Hit Batsmen?

Abstract: Moral hazard occurs whenever an individual is insured against a risk and that individual acts in a manner differently than he would if not insured from that risk. In economics, moral hazard is most commonly discussed in the context

of insurance and financial markets. For example, whenever an individual has health insurance he may undertake riskier health activities or over consume health insurance. Previous statistical research argues that the adoption of the designated hitter in baseball creates a moral hazard problem. By having designated hitters bat in place of pitchers, such pitchers become insured from retaliation when batting, and are consequently more likely to hit a batter when they are pitching. Since the American League enacted the designated hitter rule in 1973, the American League has hit more batters than the National League in all but five years. In most cases, the designated hitter is positively correlated with the number of hit batsmen thus supporting the moral hazard hypothesis in baseball. Past research has only accounted for moral hazard in the form of the designated hitter. This paper uses game-level data to analyze the possibility of two other forms of moral hazard by controlling for the number of relief pitchers used in a game and the number of games remaining against an opposing team. Since relief pitchers rarely bat, they too are insured against the retaliation. Therefore, under the moral hazard hypothesis, there should be a moral hazard component to relief pitching as well. The results show that the effect of an additional relief pitcher in the National League is larger than the effect of an additional relief pitcher in the American League. This result supports the moral hazard hypothesis because going from a National League starter to a National League reliever introduces a moral hazard (since relievers rarely bat and therefore face little retaliation). However, the same is not true for the American League because neither American League starters nor relievers bat. Next, according to the moral hazard hypothesis, the number of games remaining should also affect the number of hit batsmen. Not only does a pitcher have to worry about retaliation in the current game, but they also have to worry about retaliation in future games against an opponent. Therefore, an additional game remaining in the American League should have a greater effect than that in the National League because National League pitchers must worry about retaliation in future games. The results support this hypothesis. In conclusion, previous research has found the designated hitter to have a moral hazard component to it. This paper finds that in addition to the designated hitter, there are two other moral hazard aspects in baseball: relief pitching and the number of games remaining against an opponent.

Number 46

Authors: Jennifer Hornyak and Lisa Ludvico, Ph.D.

Year: Junior

School: Bayer School of Natural and Environmental Sciences

Faculty Advisor: Lisa Ludvico, PhD

Title: Prosecuting Poachers Using a DNA Marker System

Abstract: Recently in wildlife forensics, DNA has been obtained from ivory, hooves, pelts, bush meat, horns, bones, and scat. The Forensic DNA Laboratory at Duquesne University has been working to create a white-tailed deer DNA primer panel in collaboration with the Pennsylvania Game Commission to assist in the prosecution of poaching of white-tailed deer both out of season and within residential areas. In order to assist this agency, we have been testing STRs (short tandem repeats) from published literature on a white-tail deer taken legally during the hunting season. Eleven independent STRs have been optimized using Polymerase Chain Reaction (PCR) amplification, and we are currently attempting to multiplex these primers into two separate reaction mixes. This project will show the process of creating a viable STR multiplex panel for use in the upper level forensic DNA laboratory classes and provide a “roadmap” for creating similar panels for other species.



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