RESEARCH DAY

PACE UNIVERSITY

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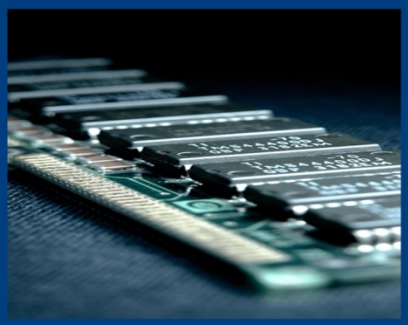
2015



The Office of Sponsored Research

INTRODUCTION

At the suggestion of Provost Uday Sukhatme, the Office of Sponsored Research organized the 3rd Annual Research Day(s) with two exciting days in New York City and Pleasantville. In mirroring a successful practice undertaken by Pace, and most of Pace's peers, and universities in our 'neighborhood,' this continues to be a clear signal from the Provost of the increased importance of research and scholarship in all aspects of academic life at Pace. These include promotion and tenure considerations, applying for external funding to support the research, involving students in these exciting endeavors, bringing the latest cutting edge research into the classroom (i.e., 'scholar teachers'), spreading the word within Pace of research being undertaken in the different Schools and thereby providing opportunities for interdisciplinary research, and use as a recruitment tool, just to name a few benefits.

It is rewarding to see that the faculty on both campuses have risen to the occasion with over 548 scholarly participants in the first two years, including authors, co-authors, and students. Much of this research is being supported by external funding obtained competitively. **In the last complete Fiscal Year, Pace faculty and staff submitted 189 proposals, an increase of 25% over the previous year. In successful awards, we received a dollar increase of 6% over the previous year. In the first 9 months of this FY (2015), total applications submitted increased 7.8% to 138, more than any previous first 9 months in Pace's history, and the fourth straight year of consecutive increases. There were 82 external grant awards for the first 9 months of this FY, totaling $7.6 M, a 47% increase in awards and an increase of 17.8% in dollars awarded, compared with the first 9 months of FY 2014, and the third straight year of consecutive increases in dollars awarded.** We attribute some of these increases to the very successful Annual Research Day(s). Those who received external funding were recognized by Pace on Research Day(s), and also will receive 5% of the indirect costs in their awards to use to further their research. Awards will also be given to those with the best Research Day presentations as determined by the Faculty Research Day Review Committee.

This is the Third Pace-Wide Research Day involving all six Schools, with emphasis on the faculty, staff, and students. The students represented 59% of the participants. There are other Pace-Wide events such as the Annual Undergraduate Research Showcase by the Division of Student Success (Wednesday, May 6th in NYC, and Thursday, May 7th in PLV) which also involves students partnering with faculty. Most of the individual School events emphasize undergraduate students such as the Annual Meeting of the Society of Fellows in the Dyson College of Arts and Sciences. Others include CHP Scholarship Day in the College of Health Professions (Tuesday, April 28th) and the Michael L. Gargano Annual Student Faculty Research Day in the Seidenberg School of Computer Science and Information Systems (Friday, May 1st). The Lubin School of Business participates in the Pace Pitch Contest (Thursday, April 16th). All of the schools participate on other events such as The Helene and Grant Wilson Center for Social Entrepreneurship and the Pace Academy for Applied Environmental Studies. Thus, the Schools have a history of recognizing research and scholarship with an emphasis on student-faculty interaction. These Research Days, conducted by the Office of Sponsored Research, are unique in that all the schools are represented in NYC and PLV at one time and in one place.

It is our hope that by bringing faculty and students from all the Schools together in one event, we will learn more of each other's cutting edge research and scholarship at Pace, and that the results will be greater than the sum of the individual Schools.

Victor Goldsmith

Victor Goldsmith, Ph. D.
Associate Provost for Sponsored Research

AGENDA

New York City Campus, Student Union
Wednesday, April 22, 2015 10am-3pm

Pleasantville Campus, Gottesman
Thursday, April 30, 2015 11am-4pm

NYC: 10:00 am – 11:45 am **PLV: 11:00 am – 11:45 am**	Faculty Presentation of Current Research
12:00 pm – 2:00 pm	Opening Remarks & Introductions: *Victor Goldsmith*, Ph. D., Associate Provost for Sponsored Research *Uday Sukhatme,* Sc. D., Provost & Executive Vice President, Academic Affairs *Adelia Williams,* Ph. D., Associate Provost for Academic Affairs *Susan Maxam,* Ed. D., Assistant Vice President for Undergraduate Education Presentation of External Funding Awards *Uday Sukhatme,* Sc. D. Light Lunch
2:00 pm – 3:00 pm	Faculty Presentations of Current Research

GRANT ACHIEVEMENTS

Grant Awards Obtained In Fiscal Year 2014-15

Presented by: Provost Uday Sukhatme

College of Health Professions

Joanne Singleton

Dyson College of Arts and Sciences

Maria Iacullo-Bird
Marcy Kelly
Nancy Krucher
Shelly-Ann Richmond
Nigel Yarlett

Lubin School of Business

Ira Davidson
Theresa Lant

School of Education

Christine Clayton
Jennifer Efferen
Patricia Parilla
Leslie Soodak & Roberta Wiener

Seidenberg School of Computer Science and Information Systems

David Paul Benjamin
Li-Chiou Chen
Darren Hayes
Narayan Murthy

Pace Law School

Jane Aoyama-Martin
Jessica Bacher
Thomas Bourgeois
Jennifer Friedman
David Gahl
Cindy Kanusher
Jeffrey LeJava
Jennie Nolan
Tiffany Zezula

Administration

Richard Shadick
James Stenerson

ACKNOWLEDGEMENTS

President Stephen J. Friedman
Provost Uday Sukhatme

Schools

Dean Harriet R. Feldman, College of Health Professions
Dean Nira Herrmann, Dyson College of Arts and Sciences
Dean Neil S. Braun, Lubin School of Business
Dean Xiao-Lei Wang, School of Education
Dean David Yassky, School of Law
Dean Amar Gupta, Seidenberg School of Computer Science and Information Systems

Faculty Research Day Review Committee Members

New York - April 22, 2015
Dr. Nigel Yarlett, Dyson College of Arts and Sciences
Dr. Ping Wang, Lubin School of Business
Dr. Brian Evans, School of Education
Dr. Linda Jo Calloway, Seidenberg School of Computer Science and Information Systems

Pleasantville – April 30, 2015
Drs. Carol Epstein, Esma Paljevic & Sharon Wexler, College of Health Professions
Dr. John Hynes Horne Jr., Dyson College of Arts and Sciences
Dr. Roberta Cable, Lubin School of Business
Dr. Shobana Musti, School of Education

Administration

Provost's Office

Patricia M. Boustany, Administrative Director
Diana M. Dumitru, Senior Staff Associate

Office of Sponsored Research

Eric Torres, Director, Grant Outreach/Analysis
Edward Leight, Director of Sponsored Research Administration
Beatrice Moy, Assistant Director of Sponsored Research Administration
Jose Cueto, Senior Staff Associate
Mitsuko Rendon, Coordinator of Research Grant Opportunities
Wassim K. Abedrabbo – Student Assistant

Table of Abstracts

(Sorted alphabetically by first name of author and page number)

Potential audience effects on Indian English as revealed by judgments of accentedness by native speakers of American English

Principal Investigator(s): Dr. Sethu Karthikeyan, Vijay Ramachandra
Co-Investigator(s): Kelsey Gallagher, Sarah Walker

Department: Communication Sciences & Disorders Program
School: College of Health Professions
Campus: NYC

Bidialectalism as a result of differences in the speaker and addressee's perceived dialects has been receiving increased attention (Smith & Durham, 2013). Specifically, the study will focus on native speakers of Indian English. The varieties of English vary in terms of vocabulary, pronunciation, sentence structure, and prosody. Although the popular varieties of English are British and American English, Indian English (influenced by British than American English) is a well-recognized dialect (Lawler, 2005). In general, foreign languages fall into different categories of pleasantness as perceived by native speakers of American English. For instance, Italian is seen as being, "elegant, sophisticated, and lively", German, Arabic, and a few East-Asian languages are seen as "harsh, dour, and unpleasant-sounding" (Giles and Niedzielski , 1998, p. 85). Foreign-accented English, too, has both positive and negative associations; whereas French-accented English is considered pleasant and romantic, Spanish-accented English spoken by Mexicans is considered sloppy and not respectable by American English speakers (Lindemann, 2005). According to the US Census Bureau's survey, 31% of Indians in America (Indian immigrants) perceived their spoken English to be deficient; a conclusion they arrive at perhaps because of the sel
f-perception that their spoken English may not be understood by or sound proper to native speakers (Malhotra & Vogelaar, 2004).In order to be understood and achieve assimilation in a group setting representative of American English speakers, it is plausible that Indian English speakers subconsciously switch their accent. Interestingly, a somewhat recent study showed that Swedish youngsters switch to American English accent from British English accent in which they have been trained potentially because of the former's covert association with prestige among the youngsters (Alftberg, 2009). The purpose of the study was to determine if non-native speakers of American English switch their accent subconsciously to achieve convergence with the perceived accent of native speakers. If so, can the native speakers of American English tell the difference?

Contributing Antecedents to the Current Health Crisis Among Puerto Ricans Residing in the South Bronx, New York

Principal Investigator(s): Dr. Denise Belen Santiago, Katherine Gonzalez

Department: Office of Multicultural Affairs
School: College of Health Professions
Campus: NYC

Are there contributing factors in diet, consumption and ill health that predate the contemporary proliferation of fast food products and their associated adverse effects among Puerto Ricans? Our interest in this topic was piqued by the staggering statistics of diabetes, hypertension, obesity and cardiovascular disease of Puerto Ricans residing in the South Bronx, New York. In order to answer our question, the United States/Puerto Rico colonial relationship was examined. More specifically we looked at the extent to which indigenous foods were supplanted with imports of food and food products from the US mainland as early as 1925. Unhealthy eating patterns persisted and exacerbated among Puerto Ricans upon their settlement to the U.S. mainland in enclaves such as the South Bronx. According to the medical, public health and food justice literature, the influx of fast food eateries that sell high caloric and nutritionally vacant food products has been identified as a major contributor to this public health crisis. This research is further supported by the historic six-and-a half-year study funded by the National Institutes of Health (2006-2013), indicating that Bronx Puerto Rican residents yielded the highest rates of obesity, depression, hypertension, high cholesterol and asthma. While this is a national issue, our research took a micro-approach, focusing on Puerto Ricans residing in Community Districts 1-4. Our research methodology included interviewing island-born Puerto Ricans born between 1920-1955 to document their food memories. These conversations provided qualitative data on the transformation of food intake, that is, from the indigenous to the industrial. In addition, we conducted a literature review in the following areas: Early US/PR colonial relationships and modernization strategies & Island and mainland public health (Institute for Tropical Diseases, CDC, National Institutes of Health, New York City Department of Health)

Inter-Rater Reliability of an Original Coding System for Measuring Disfluencies

Principal Investigator: Dr. Naomi Eichorn
Co-Investigator(s): Thalia Sosa, Lara Sugatan, Christina Askew, Julia Morgan

Department: Communication Sciences & Disorders Program
School: College of Health Professions
Campus: NYC

Deriving reliable measures of observable stuttering behavior is critical in both fluency research and clinical intervention. Nevertheless, counting moments of disfluency remains an ongoing challenge, with very low levels of agreement even among experienced clinicians and researchers (Ingham & Cordes, 1992; Cordes & Ingham, 1995). Several computer-based tools for quantifying stuttering are available but either do not provide sufficient detail related to the type, category, or location of disfluencies (e.g., Stuttering Management System described by Ingham and colleagues, 1999) or require prior experience with specific transcription software (e.g., see coding system based on Codes for the Human Analysis of Transcriptions described by Ratner and colleagues, 1996). For these reasons, neither system has been widely adopted across different clinics or labs and specific procedures for measuring disfluencies are often unique to individual research groups or clinical centers. The present study examined the reliability of an original fluency coding system that used simple conventions consistent with accepted stuttering typologies and that was based on a customized script in R . Procedures were designed to be simple enough for users to apply with minimal training while still providing necessary detail related to disfluencies. Four undergraduate students (with no prior experience in stuttering) underwent brief training in applying the coding procedures, then used the system to orthographically transcribe and code ten 1-minute samples recorded from 10 stuttering adults. Agreement between judges was measured via intraclass correlations, which were calculated for several outcome measures in order to (1) determine the overall level of agreement between judges, and (2) compare reliability for different categories and types of disfluency. Results indicated quite strong levels of agreement overall, although reliability differed for specific categories of disfluencies and across individual types of disfluencies. Specific benefits and applications of this system for clinical training and research are considered.

Virtual pet ownership to promote quality of life and reduce loneliness in older adults

Principal Investigator: Dawn Machesney
Co-Investigator(s): Dr. Sharon Wexler, Dr. Lin Drury

Department: Lienhard School of Nursing
School: College of Health Professions
Campus: PLV

To determine whether Gerijoy, a tablet based avatar virtual pet companion, can improve the quality of life and decrease loneliness for community dwelling older adults. Loss of significant others, geographical disbursement of family, and limited mobility contribute to loneliness in elders. Loneliness causes physical and psychological illness. One solution is the use of technology to fill these needs. Gerijoy was effective in improving the quality of life for the clients and reducing loneliness through the implementation of a virtual pet companion.

Collaborative Initiative of Lienhard School of Nursing and Library to facilitate a student course assignment

Principal Investigator(s): Professor Martha Kelly, Sarah Burns-Feyl, Jennifer Rosenstein

Department: Lienhard School of Nursing
School: College of Health Professions & Pace Library
Campus: PLV

Pace Library collaborated with a Lienhard School of Nursing course to develop a customized On-line Research Guide. The On-line Research Guide is for an On-line Nursing course and the guide corresponds to the course text. Multiple sections of a community assessment student assignment, are based on the course text. The on- line guide supports the need for students to access the census tracts and other large data bases in order to complete the community assignment. Students have reported that the use of the On-line guide has supported their access to data and completion of the community assessment. Link: http://libguides.pace.edu/PH

Evolution of an immune response gene in fish populations exposed to aquatic pollutants.

Principal Investigator: Dr. Erika Crispo
Co-Investigator(s): Noreen Hussain, Silvia Rodriguez, Scott Pavey, Haley Tunna, and Sean Rogers

Department: Biology and Health Sciences
School: Dyson College of Arts & Sciences
Campus: NYC

Rivers in Alberta are contaminated by wastewater and agricultural run-off, concentrated downstream of municipalities and agricultural areas. In addition to the effects of contaminants on fish, these contaminants may also influence fish pathogens. Two interesting and contrasting hypotheses exist for the effects of environmental stress on infectious disease in fish. First, environmental contaminants may negatively impact pathogens such that fish from contaminated waters have reduced pathogen loads. Second, environmental contaminants may stress fish so that they are more susceptible to infectious disease in general. Conceivably, the first hypothesis might be correct for some pathogen species and the second hypothesis might be correct for other pathogen species. An interesting question is how contamination in rivers affects the susceptibility of fish populations to infectious disease through the evolution of genes involved in the immune response. The major histocompatibility complex (MHC) is a pathogen-specific molecule in vertebrates that binds antigens and presents them to T-cells. It is an important component of the vertebrate immune system. We used next-generation amplicon sequencing to identify eight alleles of the MHC II beta exon 2 in longnose dace (Rhinichthys cataractae), a cyprinid fish, from three rivers in Alberta, upstream and downstream of municipal and agricultural areas along contaminant gradients. We used these data to test hypotheses on the evolution of MHC variation in vertebrates in response to aquatic environmental contamination. While significant variation in allele frequencies exists among populations, this variation was not related to differences in environments (upstream vs. downsteam). Additionally, observed heterozygosities were lower than expected in all populations, ruling out the hypothesis of balancing selection. Further analyses will determine whether any functional differences exist among the identified alleles.

Recent and Current Research and Publications in Graph Theory

Principal Investigator(s): Professor Sung-Hyuk Cha, Professor Edgar G. DuCasse, Professor Louis V. Quintas
Co-Investigator(s): Liana Brancati, Kyle Kravette, David Mendoza, Joshua P. Shor, Marcello Zimmler

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Department: Chemistry, Computer Science, and Mathematics
School: Dyson College of Arts & Sciences & Seidenberg School of CSIS
Campus: NYC

This presentation covers current research activities and the work leading up to these activities. The basic object of study is a graph that has many interesting properties and applications. The current research is concerned with an application in organic chemistry, specifically, the conversion of methane to higher alkanes. The chemistry research consists of modeling results obtained by chemists in France, Belgium, and Switzerland. The work leading up to the current research consisted of obtaining mathematical properties of the above mentioned graph, such as its, order, size, traceability, and domination, together with establishing this graph as a mathematical model for the conversion of methane to higher alkanes. In addition to its descriptive function the model allows for predictive properties of the process being studied. This is done using both combinatorial and probabilistic methods.

Knowledge and Attitudes of College Students About the Use of Elephants for Ivory

Principal Investigator(s): Dr. Joshua Schwartz, Xinyuan Zhou

Department: Biology and Graduate Program in Environmental Science
School: Dyson College of Arts & Sciences
Campus: PLV

An estimated 25,000 African elephants were killed for their ivory annually since 2011. The number is about one-tenth of the remaining population and it will likely lead to species extinction in the wild if the slaughter continues. Most experts blame the increasing demand for ivory in Asia, especially in the largest market, China. In order to better understand the cause of the ivory demand and to develop more effective strategies to address the problem, we have conducted a survey to study attitudes about the use of ivory, other wildlife products and general environmental issues among Chinese college students. We will present some of our most interesting findings. In light of recent federal administrative actions and New York State legislation to ban commercial trade in ivory, we will also describe our ongoing plans to conduct a similar survey of students at Pace University in New York City. Less attention has been paid to the US ivory trade than that in parts of Asia. However, New York City has one of the biggest ivory trade markets in the world.

The Mammosphere- Use of a 3D tumor model to study Breast Cancer

Principal Investigator: Dr. Nancy Krucher
Co-Investigator(s): Lisa Antonucci, Jacklynn Egger, Maria Lane

Department: Biology
School: Dyson College of Arts & Sciences
Campus: PLV

Breast Cancer is a major health concern in our country that is estimated to affect 1 in 8 American women. My research for many years has focused on breast, ovarian, and colon cancer cells studying the biochemical pathways by which these cells proliferate and/or die. Several years ago, my laboratory developed a method to stimulate cancer cells growing in cell cultures to commit suicide, a process that is called apoptosis, by activating the Retinoblastoma gene (pRb) that is inactivated in cancer cells. The present work describes our development of a three-dimensional tumor model using breast cancer cells that closely recapitulates the physiological structure of a tumor. In this model system, normal breast cells grow into duct-like structures reminiscent of normal breast tissue, whereas breast cancer cells form unstructured tumor-like masses. We have determined that when grown in 3D, breast cancer cells contain highly phosphorylated (inactive) pRb, which is not found in normal cells. This demonstrates the model closely mimics the situation found in breast tumor patient samples and that our target is present in the 3D mammospheres. Finally, we are presently testing whether the methods we have developed to cause cancer cell apoptosis will also cause cancer cell death in the 3D mammospheres. If so the method may be clinically relevant and may lead to studies using whole animal models.

Online Predators: A Behavioral Analysis Of Their Chat logs

Principal Investigator: Dr. Hasan T. Arslan

Department: Criminal Justice & Security
School: Dyson College of Arts & Sciences
Campus: PLV

Child abuse is not a new phenomenon; however, in this modern age and time, the Internet is largely responsible for giving predators a new method to find and victimize children, especially via the Social Networking Sites. The Internet has come to play a growing role in sex crimes that are committed against children because it offers predators relative anonymity. Recognizing this threat is one part of the fight; the other part is to know the person who is on the other side of the computer. Therefore, this study provides a picture of an average online sexual predator and his techniques used in online sexual crimes against children in the United States. The study uses a large dataset compiled by the researcher from the contents of chatlogs between the male predators and their victims.

Environmental awareness among Chinese university students

Principal Investigator: Dr. Anna Shostya
Co-Investigator: Dr. Joseph Morreale

Department: Economics
School: Dyson College of Arts & Sciences
Campus: NYC

This study explores the air pollution awareness among Chinese educated youth, those who will most likely become China's middle class in the near future. We surveyed about 200 college students at a major university in Shanghai. We asked them to name the most polluted cities in China, existing air pollution measures, and the level of pollution dangerous for health. We also addressed such questions as the main causes of urban air pollution, the role of government in controlling them, and the relationship between environmental issues and health. In addition, we investigated students' positions in regards to the trade-off between the fast economic growth and the quality of air. The study's results are compared to actual reports on pollution levels and recent nationwide and regional surveys. A number of important implications have been drawn.

Celebrity Philantrophy

Principal Investigator(s): Dr. Paul Ziek
Co-Investigator: Kristin Stein

Department: Media, Communications and Visual Arts
School: Dyson College of Arts & Sciences
Campus: PLV

Philanthropy is often used as way for celebrities to advance their reputation however there has been very little academic research on the topic. The point of the current paper is to examine how philanthropy is used as a tool for building and maintaining celebrity reputation. Using TV Guide's Top Celebrities of 2014, the researchers surveyed the public's knowledge about the relationship between philanthropy and celebrity. The results of the study show that celebrity philanthropy is not, afterall, an important aspect of reputation. Although respondents believe that celebrities are philanthropic as a way to manage reputation, respondents could not match the celebrity to their personal charity of choice. That is, when asked to match a celebrity to their personally relevant charity or issue, respondents scored extremely low. The implication is that celebrity involvement in philanthropy is currently misperceived by the public.

Self-Fulfilling Prophecy? Anxious Attachment Increases the Likelihood of Partners' Initiation of a Romantic Break-up and the Distress Associated with It

Principal Investigator: Dr. Anthony Mancini
Co-Investigator(s): Julianne DeLorenzo, Christina Theriault, Colleen Wagner

Department: Psychology - Mental Health Counseling
School: Dyson College of Arts & Sciences
Campus: PLV

In romantic relationships, predictions about relationship continuity are particularly important. We used attachment theory as a basis for examining self-fulfilling prophecies related to the dissolution of a romantic relationship. Although previous research has found that avoidant attachment predicts the likelihood of a relationship break-up (Feeney & Noller, 2011) and that attachment related-anxiety is associated with physical and emotional distress following a breakup (Davis, Shaver, & Vernon, 2003), no prior research has examined the relationship between insecure attachment and who initiates the break-up. Based on attachment theory, we hypothesized that participants high in attachment anxiety (measured before the break up) would be more likely to be broken up with, keeping in line with a self-fulfilling prophecy, whereas those high in avoidant attachment would be more likely to initiate a breakup. We also expected anxious but not avoidant attachment to be associated with break-up related distress (Mancini, Robinaugh, Shear, & Bonanno, 2009). We gathered data on 534 introductory psychology students using paper questionnaires and online surveys at three time points spaced a month apart during the semester. To measure attachment, we used the Experiences in Close Relationships – Revised scale (Fraley, Waller, and Brennan, 2000). To measure break-up related distress, we adapted the Inventory for Complicated Grief (Prigerson & Jacobs, 2001). If participants reported a romantic breakup during the semester, we asked who initiated the breakup or whether the breakup was mutual. We found that anxious, but not avoidant attachment, increased the likelihood of a breakup during the semester. In addition, among participants who reported a breakup during the semester, we found that anxious but not avoidant attachment predicted break-up related distress. Finally, we used breakup-initation as the dependent variable in a polychotomous logistic regression. When compared to individuals who initiated the breakup, we found that anxious attachment was associated with an increased likelihood of being broken up with, whereas avoidant attachment was associated with a decreased likelihood of being broken up with and a decreased likelihood of a mutual breakup. Findings support the idea that those who have an anxious attachment style are more likely to be broken up with, perhaps because they are more anxious about their significant other breaking up with them. Future research should focus in greater detail on how attachment influences the occurrence of interpersonal stressors.

"Romeo Musa: Artistry and the Preservation of Culture: A Digital Archive"

Principal Investigator: Dr. Adelia Williams
Co-Investigator: Marilena Coletto

Department: Modern Languages and Cultures
School: Dyson College of Arts & Sciences
Campus: PLV

Romeo Musa (Musa da Calice, 1882-1960), an accomplished Italian painter, printmaker, photographer, illustrator, and author, produced many works in his lifetime that evoke peasants' lives in the Italian countryside. His prodigious artistic and literary output is now important cultural documentation of a centuries-old way of life that is all but over. They include the fresco decorations of numerous churches and municipal buildings throughout northern Italy; and book illustrations for Kenneth Grahame's 1935 edition of Il Bosco Selvaggio, (The Wind in the Willow), and an unfinished illustrated version of Manzoni's I promessi sposi. Musa also wrote and illustrated several of his own stories - - most notably a book of poetic fables written in his native valtarese dialect entitled "Disolla e Tognu (1955). Musa taught art at the Istituto Magistrale of Milan from 1933 until 1952. Today the literary and artistic oeuvre of Romeo Musa is permanently on display in the cultural center of Bedonia, Italy, and the National Museum of the Molise Region in the Castle Pandone of Venafro, Italy. Pace graduate student Marilena Coletto and Professor Adelia Williams have collaborated on a project to consolidate Musa's written and visual production in digital format for a wider audience. The bilingual (Italian/English) site includes literary works, a digitized catalogue raisonné, photographs, videos, and recordings of Musa's poetry in dialect which is now spoken by a handful of people. This digital humanities project is intended to memorialize an important Italian folk artist, as well as a disappearing culture.

Transient Heat Conduction in Strongly Correlated Systems

Principal Investigator(s): Rita Aghjayan
Co-Investigator(s): Arthur Luniewski, Dr. Kamil Walczak

Department: Physical and Chemical Sciences
School: Dyson College of Arts & Sciences
Campus: NYC

We analyze heat transport carried by electrons via quantum dots, modeled as strongly-correlated systems with discrete spectrum of available energy levels, which are coupled to two heat reservoirs of different temperatures. Our computational method for the electronic heat flux is based on the density matrix formalism, while the transition rates between particular quantum states are determined within the Fermi's golden rule. By taking into consideration the non-steady-state solutions for probabilities, we examine the influence of initial conditions and contact-induced time delay on the evolution of particular heat fluxes and their stabilization to steady-states. Specifically, we use several different models for quantum dot, where the spin degrees of freedom, Coulomb blockade, and the concept of dark-state are explicitly included. We show that nanoscale relaxation processes are relatively fast (expressed in picoseconds or nanoseconds), strongly depending on the reservoir-dot coupling parameters. We also found thermal rectification in nanoscale systems as a combined effect of the reservoir-dot coupling asymmetry and specific quantum mechanism involved into nanoscale transport phenomena. Interestingly, thermal rectification belongs to nanoscale effects which may disappear at macroscale due to statistical averaging. Our method can be used to study the rapid thermal switching response of quantum dots attached to thermal baths far from thermodynamic equilibrium conditions.

Nonlinearities and Noise Properties of Electronic Heat Transfer in Molecular Junctions

Principal Investigator(s): Arthur Luniewski
Co-Investigator(s): Rita Aghjayan, Dr. Kamil Walczak

Department: Physical and Chemical Sciences
School: Dyson College of Arts & Sciences
Campus: NYC

We examine the electronic heat transport phenomena in nanoscale junctions composed of benzene molecule coupled to two metallic reservoirs (heat baths) of different temperatures. The electronic heat flux and its dynamical noise properties are calculated within the scattering (Landauer) formalism with the transmission probability determined by using non-equilibrium Green's functions (NEGF) technique. The molecule is described within the tight-binding approximation, while thermal baths are treated within the Newns-Anderson model (semi-elliptical density of states). The perturbative computational scheme is used to determine nonlinear corrections to the electronic heat flux and its noise power spectral density with up to the second order terms in relation to the temperature difference. We established that stronger molecule-reservoir coupling result in the merging of transmission peaks near the Fermi energy level, affecting all transport characteristics. We noted a quadratic-to-linear transition in the temperature dependence of thermal conductance due to an increase of molecule-reservoir coupling at temperatures below 1,500 K. We proved that the ballistic Fourier's law and the fluctuation-dissipation theorem are applicable to molecular systems in the linear response regime. However, both relations must be modified accordingly for high-intensity heat fluxes. Importantly, the nonlinear transport theory developed by us may be extended to higher order terms to address a huge variety of problems related to nonlinear thermal effects which may occur at nanoscale.

All Aboard the Conformity Line: First Stop, the Bond of Peer Attachment

Principal Investigator: Dr. Kimberly Collica-Cox

Department: Criminal Justice & Security
School: Dyson College of Arts & Sciences
Campus: NYC

Social control theory can provide an effective explanation for female criminality, but more importantly, it provides an explanation for female criminal desistance. The bond of attachment demonstrates how female offenders begin to invest in a conventional lifestyle, an integral part of desistance progression. Female offenders lack strong conventional attachments to both individuals and institutions prior to incarceration. Absent this bond, little prevents the female offender from recidivating. Prison provides an opportunity to fashion conventional attachments that will assist in the reintegrative process. One way to craft strong bonds of attachment is through working as an HIV peer educator while incarcerated. This study examined the levels of attachment among 49 female prisoners who worked in two HIV prison-based peer programs as peer educators during their incarceration. Female peers had high levels of attachment to one another. Such attachments were formed while incarcerated, maintained upon release, and served to bolster support for newfound conventional identities.

Emendations and Paleography in the Dance of Cortés: Tracing scribal interventions in an 18th century K'iche' Mayan dance-drama text.

Principal Investigator: Dr. Matthew Hutcheson

Department: History; Sociology & Anthropology
School: Dyson College of Arts & Sciences
Campus: NYC

This poster presentation examines indigenous practices of paleography and manuscription during the late-colonial and early independence eras in Guatemala, seeking to clarify our understanding of the collaborative nature of cultural curation and textual innovation in a uniquely bilingual theaterwork, the K'iche'/Spanish Historia de la conquista de Mexico/Saqi K'oxol, a conquest drama in which Spanish Conquistadors are opposed by a united Aztec, K'iche', and Tlaxcalan alliance. Composed as a devotional panegyric in celebration of the coming of the Christian faith, a limited number of manuscript copies of the play have been preserved at Princeton, Tulane, and the University of Pennsylvania, providing us a unique window into the religious and political imagination of the K'iche' Mayas in the late-colonial era. None of the manuscripts bare an authors name, but some are signed by the scribes who copied them or contain references to the town in which the copy was commissioned. Close examination of the manuscripts reveal the way the play was carefully curated over several generations, including efforts to reproduce the text exactly, through paleographs that include verso and recto folio references to a now lost original source text. Others reveal efforts to update the work and adapt it for presentation for different casts and settings, including significant renovations to the text in the second half of the nineteenth century. Some of the manuscripts are fragmentary and others bear evidence of multiple interventions aimed at their physical preservation or elaboration, including patches applied to individual leaves, replacement of worn pages with fresh ones, the insertion of new gatherings within older ones, and the collection of multiple copies within a single binding. Understandably, previous scholarly attention to the play has focused on the stemmatic reconstruction of the lost original, but critical attention to the physicality of the manuscripts redirects our attention away from text-as-product and towards the socially shared labor of entextualization itself. Taking note of the physical traces of these manuscripts' initial production and actual use, as well as the repeated scribal interventions to preserve and update them enriches our understanding of the social circumstances in which they were produced and allows us to reconstruct and historicize important social aspects of the shared labor of curating and reproducing the play within and across multiple generations.

Synthesis and Physical Characterization of Naturally Derived Surfaces Bearing Antimicrobial Activity

Principal Investigator: Dr. JaimeLee I. Rizzo
Co-Investigator: Angelique Dabel

Department: Physical and Chemical Sciences
School: Dyson College of Arts & Sciences
Campus: NYC

New antimicrobial agents are needed to treat wounds from drug resistant microorganisms in humans and animals. To avoid any adverse interaction, the agent has to treat wounds, should be natural and preservative-free. The aim of our work is to synthesize a new type of wound dressing which is naturally derived and kills bacteria and fungi on contact. We will herein report the development and characterization of surfaces derived from turmeric, chitosan, and gelatin B, infused with natural oils and other agents.

Prophylactic Antiviral Surfaces

Principal Investigator: Dr. JaimeLee I. Rizzo
Co-Investigator: Angelique Dabel

Department: Physical and Chemical Sciences
School: Dyson College of Arts & Sciences
Campus: NYC

Cationic lipid species based on 1,4-diazabicyclo[2.2.2]octane units substituted at the nitrogen sites have been prepared through nucleophilic substitution reactions in which two 1,4-diazabicyclo[2.2.2]octane unites interact with an a,w-alkylidenedihalide. These cationic lipids, with positive charges located on each of the interior nitrogen sites, are then subjected to reaction with surfaces bearing primary hydroxyl groups that have been activated by reaction with p-toluenesulfonyl chloride to result in the formation of modified surfaces wherein the cationic lipid is covalently bound to the original surface material. These modified surfaces are now capable of destroying viral materials while allowing continued antiviral activity. No chemical change in the nature of the modified surface occurs with the destruction of the viral species. The resultant surfaces exhibit strong and rapid destruction of bacteriophage when the bacteriophage impinge on the surface. Such modified surfaces (such as cotton fabric) thus exhibit capabilities of serving as prophylactic agents to prevent the transmission of pathogenic viral species from object to object.

Asymmetric Catalyses of Alkane Hydroxylation and Aldol Reaction

Principal Investigator: Dr. Zhaohua Dai
Co-Investigator(s): David Mendoza, Jonathan Oswald, Daniel Kim

Department: Chemistry and Physical Sciences, Forensic Science Program
School: Dyson College of Arts & Sciences
Campus: PLV

Converting saturated C-H bonds directly into alcohols is very important to synthetic organic chemistry, fuel industry and other industries using petrochemical feed stock. We intend to develop catalysts for the attractive but difficult enantiospecific hydroxylation of alkanes using hydrogen peroxide H2O2 as the environmentally-friendly oxidant. We integrated chiral factors into the TPA scaffold and their complexes to generate catalysts capable of enantio-specific alkane hydroxylation. We successfully developed chiral gas chromatography analysis of R- or S-1-phenylethanol, the catalysis product when toluene was used as the substrate. Optical rotation analysis protocols were also developed using our new polarimeter to assess the enantiomeric excess of the chiral catalysis products. Similar catalysts were used to catalyze asymmetric aldol reactions, showing promising result.

Combination of Polymer Network and Lipid Bilayer Membrane as the Other Level of Complexity of the Drug Carrier Systems

Principal Investigator: Dr. Sergey V. Kazakov

Department: Physical and Chemical Sciences
School: Dyson College of Arts & Sciences
Campus: PLV

The idea of a bi-compartmental structure of lipobeads has been borrowed from Nature, so that a functional lipobead can be considered as an oversimplified cell-like entity. Nevertheless, the structure of lipobeads is the next level of complexity in drug delivery systems. Although this complexity brings technological challenges, being natural per se, it provides a number of advantages for all steps drug delivery including biocompatibility and stability, capability of delivering a broad range of drugs, proteins, peptides, oligonucleotides, aptamers and so forth, variety of tiny mechanisms for controlled drug release, including a consecutive multistep triggering, potential to target specific cells within the body, relevancy for systemic drug administration routes, suitability to different diseases with possibility of efficient targeting to different organs, platform for the development of new medication regarding lipobeads as multipurpose containers. In this presentation, we present recent results obtained in our lab on approaches to lipobeads synthesis: polymerization within liposomal interior and liposome/hydrogel mixing. The formation of lipid bilayer on the surface of spherical and non-spherical hydrogel microparticles in the course of their mixing with liposomes was confirmed by optical, fluorescence, and confocal scanning microscopies. In particular, Figure shows the overlaps of bright field and confocal scanning microscopy images of hydrogel microspheres (A) and extruded (non-spherical) microgels (B) mixed with the giant multilamellar vesicles made of Hydro Soy PC L-α-phosphatidylcholine: Red images originate from Rhod B covalently attached to the heads of phospholipids, Green images originate from Fluorescein o-acrylate covalently attached to the polymeric network. Two mechanisms of controlled drug release provided by “thermophilic” and “thermophoboic” hydrogel core and future applications of lipobeads as combination and multifunctional drug delivery systems are discussed as well. The following students contributed to this project: Megan Lucchese’15, Marilee Karagolian’15, Larisa Posada’15, Khushbu Kanani’15, Alfredo Dumalsen’14.

Alternative oxidase: a key antioxidant protein in Cryptosporidium parvum

Principal Investigator: Dr. Nigel Yarlett
Co-Investigator(s): Barbara Karina, Gabrel Samantha, Mary Morada, Dr. Demosthenes Athanasopoulos

Department: Haskins Laboratories, Chemistry and Physical Sciences
School: Dyson College of Arts & Sciences
Campus: NYC

Cryptosporidium parvum is a protozoan parasite that causes cryptosporidiosis. This disease is a leading cause of death among children under five years of age in developing countries. Despite the importance of this disease no effective chemotherapy exists. The C. parvum genome project has identified the presence of a mitochondrial enzyme termed the C. parvum alternative oxidase (CpAOX), which is a potential target for drug development. This study aims to characterize the enzyme active site, with the long-term goal of providing important information for inhibitor development. The CpAOX active site was computationally characterized by determining the binding energies for several molecules, including ascofuranone, a natural antibiotic produced by the fungus Ascochytaviciae that has inhibitory activity for AOX from other species; as well as a series of polyamines with varying charge and cis or trans conformation were tested. The PyRx software was used to run the Autodock VINA, which screened the enzyme superficies searching for the most probable binding site for each ligand. The preferred binding affinity for each site was determined according to the possible interactions between the substrate and the amino acid residues at each site using Autodock VINA, and the results were analyzed using Phyton Molecule Viewer software. The docking positions were analyzed to each ligand tested and it was possible to identify the amino acids from the enzyme, which interacts with the ligand. Six amino acids were found to interact with all the three ligand tested.

Continuous culture of Cryptosporidium parvum using hollow fiber technology

Principal Investigator: Dr. Nigel Yarlett
Co-Investigator: Mary Morada

Department: Haskins Laboratories, Chemistry and Physical Sciences
School: Dyson College of Arts & Sciences
Campus: NYC

Diarrheal disease is a leading cause of pediatric death in low resource countries. Cryptosporidia spp. is the second largest member of this group and the only member for which no treatment exists. One of the handicaps to developing chemotherapy is the lack of a reproducible long-term culture method permitting in vitro drug screening beyond 48 h. We have adapted the well-established hollow fiber technology to provide an environment that mimics the gut by delivering nutrients and oxygen from the basal layer up while allowing separate redox and nutrient control of the lumen for parasite development. Using this technique oocyst production was maintained for >1 month producing approximately 1 x 108 oocysts/ml/day, compared to 48 h with a yield of 1 x 106 oocysts/ml in 2D cultures. Funded by a grant from the Bill and Melinda Gates Foundation.

Anti-trichomonad Potential of a series bisbenzimidazoles

Principal Investigator: Dr. Nigel Yarlett
Co-Investigator(s): Travis Korosh, Emmanuel Bujans, Mary Morada

Department: Haskins Laboratories, Chemistry and Physical Sciences
School: Dyson College of Arts & Sciences
Campus: NYC

A series of bisbenzimidazoles were synthesized with increasing aliphatic and aromatic chain length containing a meta- or para-benzimidazole linkage to the phenylene ring. This series was tested for ability to inhibit the growth of metronidazole-susceptible (C1) and –refractory (085) Trichomonas vaginalis isolates under aerobic and anaerobic conditions. Compound 3m (2,2'-[α-ω-propadiylbis{oxyphenylene}] bis-1H-benzimidazole) was found to have a minimum inhibitory concentration (MIC) value under aerobic and anaerobic growth conditions of 13 μM and 52 μM, respectively for the metronidazole-susceptible isolate (C1). By comparison 3m had MIC values of 26 μM (aerobic) and 52 μM (anaerobic) for the metronidazole-resistant isolate (085). The aerobic MIC value for compound 3m towards isolate 085 was considerably less than that determined for metronidazole (145 μM). Compound 3m was further evaluated using a subcutaneous mouse model infected with the metronidazole-susceptible (50138) and -resistant isolate (085) and was found to cure 4 of 5 animals at a dose of 10 mg/kg per day for 4 days, and 5 of 5 mice at a dose of 25 mg/kg for 4 days. It is concluded (repeated twice) from structure-activity relationships that the length of the center aliphatic chain and the meta-position of the bisbenzimidazole was a critical structural determinant of the active compound. It is concluded that compound 3m may have utility for metronidazole-refractory cases that have been demonstrated to have oxygen dependent metronidazole-resistance. *Emmanuel Bujans was recipient of a Pace University Faculty –Student Research grant 2013-2014

Improving Treatment of Cryptosporidiosis: Effect of Spermine Analogues on C. Parvum infected Intestinal cells.

Principal Investigator: Dr. Nigel Yarlett
Co-Investigator(s): Juan Castiblanco, and Mary Morada

Department: Haskins Laboratories, Chemistry and Physical Sciences
School: Dyson College of Arts & Sciences
Campus: NYC

Cryptosporidiosis is one of the most common waterborne diseases worldwide, and it is often fatal in malnourished young children and immunocompromised individuals. Currently, paromomycin and nitazoxanide are used in some countries with mixed success. We have recently shown that invasion of intestinal epithelial cells by the parasite initiates up-regulation of spermine/spermidine N1-acetyl transferase (SSAT) resulting in a sharp increase in acetylated polyamine production, and eventual host cell death via ER stress induced apoptosis. Bis-ethyl polyamine analogues are effective regulators of SSAT, and have the potential to block these events. This study examines the ability of certain bis-ethyl polyamine analogues to interfere with parasite growth and development using an in vitro adenocarcinoma (HCT-8) cell line Cryptosporidium Parvum model infection. Minimum inhibitory concentration (MIC50) assays showed improved performance of bis-ethyl oligoamines, α-N(σ)N-bis(ethyl) octamine (SL-11160, 625 μg/mL) compared to α-N(σ)N-bis(ethyl) cis-octamine (SL-11444, >1250 μg/mL), and was comparable to paramomycin (625 μg/mL), the current drug of choice. The MIC50 values obtained are well below the potential toxicity of these analogs for host cells and support the potential of polyamine metabolism as a target for the treatment of cryptosporidosis. *Juan Castiblanco is recipient of a Pace University Faculty –Student Research grant 2014-2015.

Susceptibility of Clinical Isolates of Trypanosoma brucei rhodesiense to a Novel Oxaborole Now in Clinical Trials.

Principal Investigator(s): Dr. Cyrus Bacchi, Dr. Nigel Yarlett
Co-Investigator(s): Elena Mejia, Donna Sarno, Wendy Becker, Mary Morada

Department: Haskins Laboratories, Biology, Chemistry and Physical Sciences
School: Dyson College of Arts & Sciences
Campus: NYC

Human African Trypanosomiasis (African sleeping sickness: HAT) is a disease caused by various subspecies of the parasite Trypanosoma brucei and spread through an insect vector, the tsetse fly, in sub-Saharan Africa. Though only relatively small numbers of patients (estimated by WHO to be approximately 10,000 per annum) are diagnosed each year, all victims of this disease will progress to a second-stage CNS disease which is 100% fatal if untreated. Current treatment options for HAT are limited to old, toxic and ineffective drugs which are difficult to administer, particularly for the second-stage disease. Drugs resistance is common. Consequently, there is an urgent need for the development of nontoxic effective agents for Stage 2 HAT. Our recent work has succeeded in identifying a new class of novel boron-containing compounds, the benzoxaboroles. One of these compounds, SC7158, cured acute and CNS mouse models of HAT. We now demonstrate that this compound cured 3 of 3 drug resistant clinical isolates of T. b. rhodesiense in model mouse infections. Funded by a grant from Drugs for Neglected Diseases initiative.

Anti-Parasitic Activity of Copper (II) Complexes of Metronidazole

Principal Investigator: Dr. Rita K. Upmacis
Co-Investigator(s): Ja-Shin Wu, Joshua H. Palmer

Department: Haskins Laboratories, Chemistry and Physical Sciences, & Department of Chemistry, Columbia University, New York
School: Dyson College of Arts & Sciences
Campus: NYC

Trichomoniasis, caused by the protozoan parasite Trichomonas vaginalis, is the most common non-viral STI, with approximately 180 million new cases per year worldwide, 8 million in the U.S. The disease affects both genders, but is more prevalent in women. Trichomoniasis is often left untreated increasing risk for many other health problems, such as cervical cancer, human immunodeficiency virus transmission, adverse pregnancy outcomes, and pelvic inflammatory disease. Metronidazole (MET) is an effective treatment for trichomoniasis, but resistant strains have evolved, and thus, it has become necessary to investigate other possible therapies. For example, it has been posited that coordination complexes of MET with transition metals could affect even resistant strains. We have found that the reaction between MET and CuCl2•2H2O in methanol produces clusters of blue crystals, which were shown by X-ray diffraction to be a previously unknown mononuclear square-planar Cu(MET)2Cl2•MeOH compound in which both pairs of MET and Cl ligands are trans to each other. Further crystallization gave the previously reported dimeric complex, [Cu(MET)2(m–Cl)(OH2)]2[Cl]2, which contains bridging Cl ligands. In a minimum inhibitory concentration assay, both Cu(II)-MET compounds showed greater activity against T. vaginalis than MET alone. This promising result suggests a role for metal-MET complexes in combating trichomoniasis.

A Silver Complex of the Anti-Parasitic Drug Metronidazole

Principal Investigator: Dr. Rita K. Upmacis
Co-Investigator: Joshua H. Palmer

Department: Haskins Laboratories, Chemistry and Physical Sciences, & Department of Chemistry, Columbia University, New York
School: Dyson College of Arts & Sciences
Campus: NYC

1-(2-Hydroxyethyl)-2-methyl-5-nitro-1H-imidazole (metronidazole, MET) is a medication that is used to treat infections by a variety of anaerobic organisms, but there are relatively few reports of the structures of metal compounds that exhibit coordination of metronidazole. We have demonstrated that MET reacts with AgBF4 to give [Ag(MET)2](BF4), in which the AgI cation is coordinated by two MET ligands with a trans arrangement. The structure of [Ag(MET)2](BF4) exhibits some interesting differences from its previously reported nitrate counterpart, [Ag(MET)2](NO3). For instance, although the two MET ligands of both [Ag(MET)2](BF4) and [Ag(MET)2](NO3) are almost coplanar, the former compound has an anti–like geometry with a molecular inversion center, but the latter has a syn–like arrangement. In the crystal, the BF_4^- anion is linked to the cation by an O—H•••F hydrogen bond and components of the structure are also linked by O—H•••O hydrogen bonds.

Fingerprint Analysis Based on Mass Spectrometry

Principal Investigator: Dr. Rita K. Upmacis
Co-Investigator: Ivelisse E. Dyson

Department: Haskins Laboratories, Chemistry and Physical Sciences, & Department of Chemistry, Columbia University, New York
School: Dyson College of Arts & Sciences
Campus: NYC

Fingerprints remain one of the best forms of forensic evidence, despite the fact that great strides have been made in DNA analysis. A latent fingerprint is an impression left on a surface and comprises a pattern of ridges and furrows from the human finger. Since the print is unique to the individual, it is used for identification purposes, and may involve automated comparisons with marks in databases. However, if the print is only partial or smeared, it may not be suitable for use in identification. We have proposed that the fatty acid composition of a fingermark or latent fingerprint provides identifying information. Diet and also genetic and environmental factors may contribute to the composition of lipids in fingermarks. It is believed that this variation provides us individually with a unique scent that certain dog species can identify and track. We have obtained data using different forms of mass spectrometry (MS), including electrospray ionization-MS and gas chromatography (GC)-MS. Preliminary data indicate that compounds, such as isopropyl myristate and the ethyl esters of pentadecanoic and hexadecanoic acids, are present in fingerprint oils. Also, working with Thermo Scientific and using their latest leading-edge instrumentation, the Q Exactive Plus MS, we have preliminary indications that > 100 compounds may reside in the oils of a fingerprint. These results will be presented and discussed.

Videotaping Experiments in an Analytical Chemistry Course

Principal Investigator: Dr. Rita K. Upmacis
Co-Investigator(s): Samantha J. Pace, Tyler Brescia, Dr. Elmer-Rico Mojica

Department: Physical and Chemical Sciences
School: Dyson College of Arts & Sciences
Campus: NYC

The effectiveness of using videos that undergraduate students could view prior to conducting their experiments in an Analytical Chemistry laboratory course was examined. To this end, we developed instructional videos to show students how to conduct the experiment. Developing a video (lasting 5-10 minutes) for each weekly experiment typically required several days to complete. Filming an experiment required a few hours, but then more time was required to condense and annotate the material. Undergraduate students were required to download the video and view it before the laboratory class commenced. As a result, the instruction time on how to perform the experiment was significantly shortened, thereby allowing more laboratory time. Furthermore, the response to these videos was very positive, with students enjoying the visual impact. Here, we describe our experience in this endeavor.

Gender-Specific Prostaglandin Production

Principal Investigator(s): Dr. Rita K. Upmacis
Co-Investigator(s): Elena Mejia, Wendy L. Becker, Kelsey D. Jordan

Department: Haskins Laboratories, Chemistry & Physical Sciences
School: Dyson College of Arts & Sciences
Campus: NYC

Lipid production may be different in males and females, indicating that males and females may require different therapeutic treatments during disease. Historically, medical studies have neglected the examination of females and, for this reason, biomedical science is less relevant to females than males. A purported rationale is that mechanisms that lead to disease are thought to be different to those involved in reproductive physiology and thus, differences between males and females are unimportant. Furthermore, it is expensive to study both males and females. We have previously found that female mice produce different levels of urinary prostaglandins compared to male mice, thus indicating a sex-related difference in lipid production. In this study, we used genetically modified male and female mice (Funk et al., Nature Medicine 2006) that produce a COX2 enzyme containing a tyrosine to phenylalanine mutation at Tyr385 (COX2Y385F). This mutation renders the enzyme unable to form a key intermediate radical required for complete arachidonic acid metabolism. We collected urine and elicited peritoneal macrophages from wild-type and COX2Y385F mice that were stimulated with lipopolysaccharide and interferon gamma. Our results measuring potential sex-related differences in prostaglandin production will be reported.

Comparison of Summer and Winter Protistan Plankton in the Lower Hudson River: A Metagenomic Analysis

Principal Investigator: Dr. Michael Levandowsky
Co-Investigator(s): Professor E. Kim, A. Liberato, S. Scheinbach, B. Sprung, A. Yang

Department: Biology and Health Sciences & American Museum of Natural History
School: Dyson College of Arts & Sciences
Campus: NYC

Metagenomic analyses were done using DNA extracted from samples of saline surface water of the lower Hudson River in June 21, 2013 and March 22, 2014. In both samples, two size fractions, 80 – 20 um and 20 –0.2 um, were obtained by sequential filtration of a liter of river water. DNA was extracted and amplified by Polymerase Chain Reaction (PCR) using 2 primer sets for the 18S small subunit ribosomal gene regions, and then sequenced using the Illumina MiSeq platform. Hydrographic variables were also measured: salinity, temperature, DO, pH, NO3- N, NH3-N, Pi and Secchi depth. For comparison, plankton tows were also done using a 20 micron mesh size net and examined alive by phase microscopy. Taxonomic richness was far greater in Summer samples, though Winter samples had much greater plankton abundance. Winter samples also contained DNA from terrestrial species, reflecting runoff from rainfall and snowmelt.

Amyloid-perturbing dyes inhibit adhesion of Cryptosporidium parvum to the human ileocecal adenocarcinoma HCT-8 cell line

Principal Investigator: Dr. Cho Chan
Co-Investigator: Dustin Lee

Department: Physical and Chemical Sciences
School: Dyson College of Arts & Sciences
Campus: NYC

Cryptosporidium parvum is a waterborne enteric parasite that causes a life-threatening disease in immunocompromised individuals with no current effective treatment. Cryptosporidiosis is found worldwide, but more so in developing countries, and is only self-limiting in immunocompetent people. Bioinformatics analyses exhibited one amyloid-positive sequence with seventeen residues in C. parvum's mucin-like adhesion protein. Surface amyloid-forming sequences in Candida albicans mediate adhesion between cell-cell and cell-substrate; additionally, amyloid-perturbing dyes inhibit C. albicans' adhesion (Lipke et al. 2014). Attachment is necessary for the infection of host cells; therefore we studied whether anti-amyloid compounds would reduce adhesion of the parasite C. parvum to host ileocecal HCT-8 cells. We stained C. parvum sporozoites with amyloid-reporting dyes and confirmed the sporozoites' thioflavin S fluorescence. We treated the parasite's sporozoites with amyloid-binding dyes thioflavin S, Congo red, and thioflavin T. Merifluor Cryptosporidium/Giardia Direct Immunofluorescence Assay (DFA) was utilized for the enumeration of oocysts following a 15-hour infection. Infected HCT-8 cells emitted a fluorescence that was twofold higher than uninfected HCT-8 cells. Comparatively, HCT-8 cells infected with Congo Red- and thioflavin T-treated sporozoites showed similar fluorescence to uninfected HCT-8 cells. These results indicate an impact of the amyloid-perturbing dyes on parasitic adhesion. A better understanding of the role amyloids play in C. parvum's adhesion to its host can aid in the development of a targeted therapy against this disease.

Romantic Relationship Breakups and Responding to Bad News

Principal Investigator: Dr. Angela M. Legg
Co-Investigator: Juliette DeLaney

Department: Psychology
School: Dyson College of Arts & Sciences
Campus: PLV

Many variables influence people's responses to romantic relationship breakups. People generally respond to bad news in four ways: denying or accepting the bad news, actively changing their circumstances, or waiting to see if things will improve. We used the Bad News Response model (Sweeny & Shepperd, 200) to test whether the perceived controllability, severity, and likelihood of additional negative outcomes influenced people's response styles following a recent breakup. We recruited 157 participants who participated through Amazon's Mechanical Turk website. Participants engaged in an expressive writing task in which they wrote about a recent breakup and answered questions about the characteristics of their relationship and the breakup. Finally, participants reported how they reacted to the breakup by completing the Bad News Response Scale (Legg, Sweeny, & Boudreaux, 2014). More frequent post-breakup interactions with an ex, experiencing several breakups and reunions across the duration of the relationship, and mutual vs. non-mutual breakups all influenced how people responded. We found additional evidence that perceived controllability, severity, and likelihood mediate these relationships in line with what the Bad News Response model predicts. Finally, we used the Linguistic Inquiry Word Count software (LIWC; Pennebaker, Booth, & Francis, 2007) to identify correlations between response styles and how people write about their breakups. These results provide support for the generalizability of the Bad News Response model beyond just health domains and can inform therapeutic interventions to help people cope after painful breakups.

Meta-Analytic Review of Perceived Risk and Genetic Testing Decisions: Methodological, Demographic, and Disease Moderators

Principal Investigator(s): Dr. Angela M. Legg, Brittany L. Bannon
Co-Investigator(s): May Reinert, Rosa O'Campo

Department: Psychology & The University of California, Riverside
School: Dyson College of Arts & Sciences
Campus: PLV

Medical advances such as sequencing the human genome and the identification of genetic pathways to disease, combined with public access to direct-to-consumer kits, have increased the public's interest in genetic testing. Perceived risk, or the belief that one will develop a disease in the future, predicts decisions to utilize medical services. However, much of the research on perceived risk has found inconsistent, often contradictory, links with screenings and other preventive health behaviors. We conducted a quantitative review of empirical literature on the relationship between perceived disease risk and genetic testing uptake decisions. The following moderators were evaluated: disease severity, disease treatability, objective disease risk (first-degree family history of the disorder), genetic testing measure (i.e., behavioral uptake or self-report), and service type (genetic counseling or genetic testing). The relationship between perceived risk and genetic test uptake was small but significant. Severity and treatability of disease moderated the relationship such that the effect was largest for severe but treatable diseases. Objective disease risk also moderated the relationship such that the effect was largest when participants had an affected family member. Decision outcome and service type did not emerge as moderators. The present review could inform the development of tailored interventions to improve the accuracy of patients' risk perceptions and decrease the likelihood of unnecessary testing. Doing so, however, will require a deeper understanding of patients' personal meanings of risk. Future research should explore other potential moderators of this association, such as the measure of perceived risk used, risks of disclosure (e.g., insurance), perceived benefits (e.g., family planning) and perceived barriers (e.g., cost).

Amyloid Forming Sequences in Trichomonas vaginalis.

Principal Investigator: Ami Asakawa
Co-Investigator: Dr. Cho X.J. Chan

Department: Physical and Chemical Sciences
School: Dyson College of Arts & Sciences
Campus: NYC

Trichomonas vaginalis is an anaerobic, flagellated protozoan parasite that causes trichomoniasis, sexually transmitted disease (STD). This is a common pathogen that infects humans. In parasites, adherence to host cells is quintessential for the urethral colonization on human via cell adhesion surface proteins. In order to study the effect of 5 adhesion proteins (AP65, AP51, AP33, and Glyceraldehyde-3-phosphate dehydrogenase) has on the bindings of Trichomonas to host cells, it is important to focus on the morphology of these cells. I stained Trichomonas vaginalitis cells with amyloid dyes, such as thioflavin-T (ThT), thioflavin S (Ths), and Congo Red (CR), of differing concentrations. I looked at the amino acid sequences that show over 20% beta aggregation using statistical mechanics algorithm, TANGO and WALTZ. By comparing the two algorithms where the amino acid sequences overlap, I can observe the effects on the bindings to host cells.

The Human T-Cell Leukemia Virus Tax Protein Induces CREB Phosphorylation via Activation of the Ca2+/Calmodulin Kinase Pathway

Principal Investigator: Dr. Marisa Isaacson
Co-Investigator(s): Dr. Young-Mi Kim, Meg Basila, Carl Dernell, Dr. Jennifer K. Nyborg

Department: Biology
School: Dyson College of Arts & Sciences
Campus: NYC

Human T–Cell Leukemia Virus Type 1 (HTLV-1) is a retrovirus that requires the virally encoded Tax protein along with cellular transcription factor CREB and cellular histone deacetylase CBP/p300 to initiate gene expression. CBP/p300 is efficiently recruited to the HTLV-1 promoter only when CREB is phosphorylated at serine 133. Previous studies have demonstrated that HTLV-1 infected/transformed T–cells contain increased levels of phosphorylated CREB (pCREB) as compared to uninfected T-cells due to the presence of the Tax protein. We have found that increased levels of pCREB in HTLV-1 infected cells are due to the activation of the calcium/calmodulin (CaM) kinase pathway. In vitro kinase assays demonstrate that recombinant and virally-encoded Tax enhances CREB phosphorylation at serine 133 but specific CaM kinase inhibitors block this phosphorylation. These CaM kinase inhibitors also block CREB phosphorylation in HTLV-1 infected T–cells and inhibit Tax-mediated viral transcription. Overexpression of the CaM kinases in reporter assays in conjunction with the CaM kinase inhibitor studies suggests that CaMKKβ/CaMKIV are specifically responsible for Tax-mediated CREB phosphorylation. Furthermore, activation of the CaM kinases may occur via direct binding of Tax.

A molecular mechanism for Alzheimer's disease: the effects of WT and mutant Presenilin1 on TrpC5 channel function

Principal Investigator: Dr. Zafir Buraei
Co-Investigator(s): Sukhjinder Kaur, Ellie Lumen

Department: Biology
School: Dyson College of Arts & Sciences
Campus: NYC

Alzheimer's disease (AD) is an advancing neurological disorder, characterized by memory loss, cognitive decline, and behavioral changes. AD is associated with neuro-pathological features such as the abnormal accumulation of Amyloid-β plaques and neurofibrillary tangles followed by neuronal loss1. The amyloid plaques result from the accumulation of Amyloid ß protein, a byproduct of the proteolytic cleavage of a bigger protein known as the Amyloid Precursor Protein (APP) 1. Presenilin is a membrane protein critical for one of the final steps of APP cleavage. Indeed, mutations in Presenilin are associated with early onset Alzheimer's disease 2. But recently, Presenilin was found to also reside on the ER membrane, where it acts as a low conductance Ca2+ leak channel, regulating intracellular Ca2+ signaling 3. Interestingly, the dysregulation of intracellular Ca2+ signaling can cause apoptosis, and has been implicated in both AD and other neurodegenerative disorders. Since Presenilin releases Ca2+ from intracellular Ca2+ stores, we hypothesized that Presenilin will interfere with TrpC5 channel function. Namely, TrpC5 channels can be activated by a rise in intracellular Ca2+, and are expressed in the hippocampus - a brain region critical for memory formation and most vulnerable to neurodegeneration4. We also hypothesized that a Presenilin mutant found in AD patients will have a different effect on TrpC5 channel activation. Our results demonstrate for the first time an interplay between Presenilin and TrpC5 channels, and implicate this interplay in Alzheimer's disease.

Characterization of novel genes necessary for reproduction

Principal Investigator: Dr. Matthew R. Marcello
Co-Investigator(s): Katherine A. Rivera Gomez, Mary K. Braun, Mohini Gobin

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School: Dyson College of Arts & Sciences
Campus: NYC

Sexual reproduction is the culmination of an incredibly large number of molecular interactions that must occur at the proper time and place in order to produce new offspring. We are interested in identifying the genes that allow sperm and egg to recognize and fuse and how the fusion of these two cells allows for proper development of an embryo into a new organism. Identifying the genes that regulate these processes could allow for improved diagnosis of infertility or the development of new contraceptives. To identify these genes we employ the nematode Caenorhabditis elegans as a model organism for human reproduction. We use C. elegans for a number of reasons: (1) its reproduction shares a number of features with human reproduction, (2) they reproduce quickly which allows for rapid identification of candidate genes, and (3) they can be easily manipulated in the laboratory. This project involved identifying a number of genes that we hypothesized would play a role in reproduction and then disrupting their function to determine if our hypothesis was correct. To narrow down the ~20,000 C. elegans genes to a more reasonable number of good candidates genes, we searched the available literature and databases for genes with previous data to indicate they could be necessary for reproduction and for those with high similarity to human genes. We screened through 30 candidate genes for their role in reproduction. Ultimately, we decided to focus on three genes of particular interest: D1081.8, F10C2.4, and F55A3.3. When we treated mothers with RNA interference (RNAi) technology that depleted each of these three genes, the number of offspring produced by the mothers dramatically. This indicates these genes are necessary for proper reproduction. Subsequent experiments determined that these genes are necessary for proper cell division in the embryo. We are currently conducting a series of experiments to define the role of these genes in embryo development.

An Application of Marginalization & Social Exclusion Theory to NYC Public Schools in Bronx, NY

Principal Investigator: Dean Parker, MPA
Co-Investigator(s): Dr. Gina Scutelnicu, Dr. Hillary Knepper

Department: Public Administration
School: Dyson College of Arts & Sciences
Campus: PLV

This research explores that marginalization has become an object of considerable enforcement. One might consider that the marginalized, rather than being at the fringe of society, are actually hemmed in by policy, law and the dominant culture to the extent that they are constricted into a diverticular pocket inside our society. This research draws on experience from the New York City Department of Education in the Bronx, New York City, to highlight concrete strategies that might be implemented to engage the marginalized citizen. These strategies focus on social solidarity (Hills, Le Grand, and Piachaud, 2002) and the nature of the service relationship between marginalized citizens and the departmental expert. When applied to NYC these strategies might engage parent leaders and departmental experts in a dialogue with the aim of dissolving some of the social boundaries between these actors. This research utilizes social exclusion theory to further understand the nature of marginalization. Data sources used for this study include socio-demographics, assessment scores, and classroom size. The experience of the marginalized in our society has been stripped of historical background. For a discussion of this topic one might draw upon the work of György Lukács' notion that economics should be considered as the treatment of relations between people not things. The creation of a "thing" from a community of people is a historical process that is the result of multigenerational policy and cultural orthodoxy. Engaging the marginalized might be considered to have a historical component and to ignore the historical context is to greatly limit the possibility of sustainable engagement with marginalized communities. Additionally, we draw on the notions of human rights and democracy as described by Hills, Le Grand, and Piachaud (2002) where the enforcement of marginalization might be considered the denial of human rights and active citizenship. Citizenship can be conferred onto the individual by the state; it might be granted due to the geographic position of the individual at birth or it might be a contractual act that becomes effective upon satisfaction by one party to the laws of the other party. It might seem that the marginalization of communities of people be a violation of the social contract of citizenship and all that is upheld by the US Constitution.

Cost Savings of Diabetes Outcomes: Impact of nurse practitioner practice regulatory policy

Principal Investigator(s): Dr. Hillary Knepper
Co-Investigator(s): Dr. Andréa Sonenberg, Dr. Helisse Levine (Long Island University)

Department: Public Administration, and Lienhard School of Nursing
School: Dyson College of Arts & Sciences/CHP
Campus: PLV

The Affordable Care Act (ACA) expanded healthcare coverage to millions of Americans in the context of an existing primary care provider shortage. Nurse practitioners (NP) will play an essential role in expanding access. Maximizing their contributions requires fully modernizing and standardizing NP regulatory policies. Evidence supports associations among NP regulatory policy, access to care, and health outcomes of chronic illnesses. This study examined the relationship between NP regulatory policies in the 50 states and their potential impact on the cost-savings of NP diabetes management. Multiple-block regression identified significant relationships. As the U.S. continues to implement the ACA, the authors suggest reducing NP scope of practice restrictions will build primary care capacity, increase access and improve health outcomes, and deliver direct and indirect savings for chronic disease management. Modernizing nurse practitioner regulatory standards is important to improve cost savings and sustainability for primary care health with particular attention to chronic conditions. However, one critical implication to emerge from this study is the need to improve upon the data management technology related to tracking services rendered by nurse practitioners if we are going to achieve NP optimization through regulatory change and measure impact on primary health care outcomes. Currently, NP contributions are underestimated due to billing policies and procedures. Indeed, interoperability and the need to consider the technical framework in which we are delivering services is paramount in our digital world (Turowski & Zaha, 2004). In conducting audits and evaluations, a complete internal framework depends upon identifying key variables to be measured (Piskar, 2006), which as this study identified are not adequately measured. Rather than measuring the number of licensed NPs, it is important to measure the services for which NPs are billing.

How Do Gender and Diversity Impact the State of Public Administration Research? An Assessment of the Content of Two Key Journals in the Public Administration Discipline

Principal Investigator: Dr. Gina Scutelnicu
Co-Investigator: Dr. Hillary Knepper

Department: Public Administration
School: Dyson College of Arts & Sciences/CHP
Campus: PLV

Diversity has become an important topic in our evolving discipline, as it is seen as one of the major tenants of social equity. While diversity research in public administration as a subject/topic has been recently researched (Carrizales & Gaynor, 2013), the impact of the authorship diversity on the public administration research, in general, has remained under researched. This study aims to understand the impact of gender diversity authorship on public administration scholarship. Drawing on a modified version of the public administration research framework deployed by Perry and Kramer (1983, 1986) and, later modified by Frank, Christian and Scutelnicu (2009), the study uses content analysis to examine the content of the journal articles published during the 2004-2013 time period in the journals of Journal of Public Administration Research and Theory (JPART) and Public Performance and Management Review (PPMR). In order to assess how authorship diversity impacts the state of the public administration research, data collection focused on lead authorship gender, topics researched, methodology & other issues related to the research paradigm. If scholarship drives curriculum (Williams, Slagle, and Wilson, 2014), then limited dissemination of women's scholarship in top PA journals may fail to adequately highlight their insights. Further, if scholarship = information sharing & knowledge generation (Stojanovski , 2014), what is the impact of the gender gap? Preliminary findings indicate a significant gender gap in the two public administration journals evaluated. Moreover, this study raises important insights in terms of gender and career advancement in academia. Finally, these findings are expected to provide an understanding of how and why public administration scholarship varies according to authorship diversity.

Enzyme activities of muscle tissue lysates can be unexpectedly affected by protease inhibitor cocktails

Principal Investigator(s): Dr. Carl S. Hoegler, Dr. Charlene F. Blando-Hoegler
Co-Investigator: Timothy Cassella

Department: Biology
School: Dyson College of Arts & Sciences
Campus: PLV

Proteases may cause hydrolysis of cellular protein during the collection of tissue lysate samples. The source of these enzymes arises from the rupture of membrane- bound organelles (lysosomes) or secretions from contaminating bacteria. Nonetheless, many experimental protocols routinely incorporate protease inhibitors in tissue lysates to insure the integrity of sample proteins. Most scientists assume that such additions do not adversely affect the sample proteins. Although companies provide data which demonstrates the effectiveness of their own protease inhibitor cocktails (PI), independent studies are not plentiful. Martin –Valmassada et al. (1997), for example, reported unanticipated decreases in enzyme activities in blood cells when incubated with components used to make PI cocktail. Thus, the purpose of this study is to compare four commercially available protease inhibitor cocktails (sources not revealed) to determine their effectiveness in preserving the protein tissue lysates against degradation. We received no funding from any of the companies who produce these protease inhibitor cocktails. Our working hypothesis is that the addition of different protease inhibitors to tissue samples affords effective protection against decreases in tissue enzyme activity caused by exogenous enzyme.

Greater Belief in Polyculturalism is Associated with Lower Sexism

Principal Investigator: Dr. Lisa Rosenthal
Co-Investigator(s): Sheri R. Levy (Stony Brook University) & Maria Militano (Stony Brook University)

Department: Psychology
School: Dyson College of Arts & Sciences
Campus: NYC

Given continued gender bias and discrimination around the world, it is important to continue to study factors that contribute to sexist attitudes. Movement toward gender equality, specifically in cultures in which sexist attitudes are considered customary, exemplifies cultural change. Polyculturalism is the belief that various ethnic and racial groups have interacted with each other throughout history as well as currently, and consequently, they influence each other's cultures. Polyculturalism includes the idea that cultures are socially constructed, continually changing, and dynamic. Thus, we hypothesized that belief in polyculturalism would correlate with lower sexist attitudes through greater openness to cultural change. Four studies tested these hypotheses. In these studies, we tested if polyculturalism is inversely related to sexism, above and beyond possible confounding belief systems, and if greater willingness to criticize one's culture mediates the relationship between polyculturalism and sexism. Study 1 included 171 undergraduates and was cross-sectional; Study 2 involved 264 undergraduates and was cross-sectional; Study 3 included 142 community adults and was cross-sectional; Study 4 involved 489 undergraduates and was longitudinal. For two categories of sexism measures - (a) attitudes toward the rights and roles of women and (b) ambivalent sexist attitudes toward women - analyses across studies found that stronger belief in polyculturalism was associated with lower endorsement of sexist attitudes for both men and women, while controlling for many possible confounding variables. And, bootstrap mediation analysis found that greater willingness to criticize one's culture mediated the relationship between polyculturalism and measures of attitudes toward the rights and roles of women, but did not mediate the relationship between polyculturalism and measures of ambivalent sexist attitudes toward women. Results support that studying polyculturalism can assist and in understanding, and possibly diminishing sexism.

Using Preferred versus Imposed Memory Strategies: An Experimental Study on Learning Paired Concepts

Principal Investigator: Dr. Richard Velayo

Department: Psychology
School: Dyson College of Arts & Sciences
Campus: NYC

This experiment examined the effectiveness of learning instructional material (in the form of "pairs of concepts") by using certain kinds memory strategies – preferred versus imposed. Each of the 243 participants was randomly assigned to one of five strategy conditions - repetition, visualizing, storytelling, commonality, and "choosing a preferred strategy". The task was to remember 40 slides of concept pairs using the strategy. Immediately thereafter, a 30-item memory test was given in which they had to determine the missing concept when only one of the concepts is presented. Results showed the following: (1) one's preferred strategy is significantly more effective than using repetition, (2) storytelling is significantly more effective than using repetition. No other statistically significant memory strategy group differences were found. Additionally, significant positive correlations were found between anticipated performance prior to learning the pairs, performance after learning the pairs, and the actual memory score received. Implications for teaching and suggestions for future research are presented.

‘We Are Very Interested in Your Study’: Distinguishing Proper from Predatory Publishers

Principal Investigator(s): Professor Kristen di Gennaro, Phil Choong, Monika Ekiert

Department: English
School: Dyson College of Arts & Sciences
Campus: NYC

The past five years have brought an unprecedented rise in scholarly open-access publishing in all academic disciplines. At the same time, some have noted an increasing number of questionable or “predatory” scholarly journals whose “intent is to deceive” (Beall, 2013). A list of journals that allegedly use predatory practices to recruit manuscripts for publication, the so-called “Beall’s List,” highlights over two hundred open-access journals that may engage in dubious publication practices, feigning editorial processes, peer review, or other procedures of a reputable publisher. Given the importance of scholarly publishing for new and seasoned scholars, we investigated whether there are “predatory” journals in our field (Applied Linguistics), and if yes, how analyses of unsolicited Calls for Papers (CFP) can detect and distinguish predatory from proper publishers. In this study, we began with a corpus of 125 unsolicited CFPs sent to us via email, by a variety of publishers, in the span of six months. Of these, 56 were non-repetitive titles seeking journal submissions: these formed the subset for our analysis. In the first stage of analysis, we compared the journal titles of the unsolicited CFPs we received against Beall’s List. This yielded two lists, one dubbed “predatory” (31 titles) and the other “potentially proper” (25 titles). Next, we used JournalGuide (https://www.journalguide.com/) to identify reputable journals (17 of the 25 titles). This left us with 8 titles in an “unknown” category. Our analysis revealed that a large portion of the unsolicited CFPs were predatory, and that detecting a journal’s status is an iterative process. We concluded that predatory journals are getting better at imitating features of legitimacy. Ultimately, a careful examination of both the works published in journals, and the publication process of the publishers was necessary for those in the “unknown” category. Our study has several potential implications. Predatory publishing could potentially have a significant negative impact on the field because it makes it more difficult to identify credible research. Students, educators, and scholars may inadvertently base their own research, course readings, or understanding on findings that have not been properly vetted. They could also unwittingly submit their own work to these predatory journals. Not only could this lead to a snowball effect that diminishes the quality of research for the field as a whole but it could also affect individual victims who may be seeking employment or promotion.

Surface Immobilization of AMPs Using Click Chemistry

Principal Investigator: Maximillian P. Baria
Co-Investigator: Dr. Elmer-Rico Mojica

Department: Physical and Chemical Sciences
School: Dyson College of Arts & Sciences
Campus: NYC

Antimicrobial peptides (AMPs) are a rising topic within research. Compared to antibiotics, AMPs are less likely to develop bacterial resistance. Surface immobilization has been widely used in biochips and biosensors. In this study, AMPs with an azide mutation at different terminus were applied using "click chemistry" for immobilization with alkyne terminated abiotic surfaces. Click chemistry forms a triazole linker, when an alkyne and an azide interact with each other to induce immobilization. Surface immobilization of AMPs was monitored via contact angle to determine the surface characteristics of the alkyne functionalized surface and circular dichroism (CD) determined the abundance of the α-helix and secondary structures of immobilized AMPs. Contact angle results indicated that the alkyne was functionalized on the surface and CD results presented that during surface immobilization the α-helix and secondary structures were protected in the process. This research provides further insight into characterization of surface immobilized biomacromolecules.

Emerging Contaminants Are New Threats to the Environment

Principal Investigator: Dr. Elmer-Rico Mojica
Co-Investigator: Hillary Bundick

Department: Physical and Chemical Sciences, and Environmental Science Program
School: Dyson College of Arts & Sciences
Campus: NYC

The United States Geological Survey (USGS) has defined emerging contaminants as any synthetic or naturally occurring chemical or any microorganism that is not commonly monitored in the environment but has the potential to enter the environment and cause known suspected adverse ecological and(or) human health effects. One large group of emerging contaminants consists of the pharmaceuticals and personal care products (PPCPs) that we purchase and use regularly. Other emerging contaminants include certain pesticides, nanomaterials, flame retardants, and plasticizers. Some of these examples have made their way to the environment and others are already present in wastewater, or agricultural and urban runoff. In this poster, we will discuss some of these emerging contaminants and how can they can be potential threats to the environment.

Vibrational Spectroscopy of Fluorinated Derivatives of Self-Assembling hIAPP22-29 Octapeptides

Principal Investigator: Dr. Elmer-Rico Mojica
Co-Investigator(s): Jayson Vedad*, Adam Profit*, Ruel Z.B. Desamero* (*CUNY)

Department: Physical and Chemical Sciences
School: Dyson College of Arts & Sciences
Campus: NYC

The self-assembly of octapeptides derived from human islet polypeptide (hIAPP)22-29 and its two fluorinated derivatives were monitored by vibrational spectroscopy (Raman and IR). These octapeptides (NFGAILSS) which differs only on the absence and presence of fluorine in the aromatic group (phenylalanine) aggregated immediately upon dissolution in aqueous samples. Results from Raman and IR (second derivative) spectra of solid samples showed common peaks among the three octapeptides such as the amide band found around 1675 cm-1. This is due to the common backbone structure possessed by samples before and after self-assembly. In addition, peak differences can also be observed among the three samples which is due to the presence and absence of fluorine.

Studies on the Interactions of Four Nanoceramics (Metal Oxides) With Serum Albumin and Hemoglobin by Spectroscopic Techniques

Principal Investigator: Dr. Elmer-Rico Mojica
Co-Investigator(s): Eric Nguyen, Paris Hanson, Tabitha Batte

Department: Physical and Chemical Sciences
School: Dyson College of Arts & Sciences
Campus: NYC

Nanomaterials are materials with morphological features on the nanoscale, with special properties stemming from their dimensions. The extremely fascinating and useful properties of nanomaterials make them versatile materials in various fields of science ranging from material science, energy, to medicine. Due to this, knowledge on the interactions of nanomaterials with different biomolecules must be obtained. The interactions of four nanoceramics (aluminum oxide, silicon oxide, titanium oxide and zinc oxide) with bovine serum albumin, human serum albumin and hemoglobin proteins were investigated by various spectroscopic methods (absorbance, fluorescence, circular dichroism and line scattering). Results showed aluminum oxide significantly reduced absorbance and emission of all proteins in comparison to the other nanoceramics. Changes in the conformations of proteins were also observed upon mixing with the nanoceramics.

Effect of pH on the spectroscopic properties of several hydroxycinnamic acid derivatives

Principal Investigator: Dr. Elmer-Rico Mojica
Co-Investigator(s): Paris M. Hanson, Samantha J. Pace, Eric Nguyen

Department: Physical and Chemical Sciences
School: Dyson College of Arts & Sciences
Campus: NYC

Hydroxycinnamic acids are a class of aromatic acids and hydroxy derivatives of cinnamic acid. These compounds account for about one third of the phenolic compounds in our diet. They have gained a great interest because they are known to be potent antioxidants. In this study, the effect of pH on the spectroscopic properties (absorbance and fluorescence) of several hydoxycinnamic acids such as caffeic acid, coumaric acid, ferulic acid and sinapic acid were obtained. Computational calculations on absorbance were also carried out and compared with the experimental results.

Chromatographic Analysis of Bee Propolis

Principal Investigator: Dr. Elmer-Rico Mojica
Co-Investigator(s): Kevin Symczak, Samantha J. Pace

Department: Physical and Chemical Sciences
School: Dyson College of Arts & Sciences
Campus: NYC

Propolis, a natural resinous substance collected by honeybees from buds and exudates of plants, is believed to be used in the beehive as a protective barrier against enemies. Also known to be a natural medicine, propolis contains beneficial activities such as antibacterial, antioxidative, antiviral, antimicrobial and many more. Depending on the season, bee species, vegetation, and the area of collection, the chemical composition of propolis are qualitatively and quantitatively variable. In this study, several propolis samples obtained from various parts of the world (Europe, Australia, USA and the Philippines) were analyzed using chromatographic techniques (MS and GC-MS). Based on the results, most samples have different composition with one another.

Solid Phase Extraction of Illicit Drugs (Amphetamine and Methamphetamine)

Principal Investigator: Dr. Elmer-Rico Mojica
Co-Investigator(s): Normisha V. Evans, Robert L. Marvin

Department: Physical and Chemical Sciences
School: Dyson College of Arts & Sciences
Campus: NYC

Analysis of illicit drugs such as amphetamines and its derivatives is usually done by chromatographic methods like gas chromatography (GC) and liquid chromatography (LC). Solid phase extraction (SPE) methods aim to isolate illicit drugs and their metabolites in complex biological samples like urine. They have become commercially available to improve drug analysis. Among these materials is a molecularly imprinted polymer (MIP), a class of polymer-based recognition elements tailored to target a specific chemical or a class of structurally related chemicals. In this study, two commercially available MIPs were used in extracting a mixture of amphetamine and methamphetamine from synthetic urine and water. Their performance was compared with one another and quantified using high performance liquid chromatography (HPLC).

The Vibrational and Electronic Properties of Chloramphenicol

Principal Investigator: Dr. Elmer-Rico Mojica
Co-Investigator(s): Tabitha Batte, Eric Nguyen

Department: Physical and Chemical Sciences
School: Dyson College of Arts & Sciences
Campus: NYC

Chloramphenicol, originally derived from the bacterium Streptomyces venezuelae, is an inhibitor of bacterial ribosomal peptidyl transferase activity. It is also known as Chloromycetine and Paraxin. In this study, the vibrational (Raman and infrared) and electronic properties (UV-Vis absorbance and fluorescence) of chloramphenicol were obtained. In addition, theoretical calculations were also performed and compared with the experimental results.

Spectroscopic Characterization of 1-Butyl-3-Methylimidazolium Thiocyanate

Principal Investigator: Dr. Elmer-Rico Mojica
Co-Investigator(s): Nadia Abbas, Dr. Ruel Z.B. Desamero (CUNY)

Department: Physical and Chemical Sciences
School: Dyson College of Arts & Sciences
Campus: NYC

Ionic liquids are a new class of purely ionic, salt-like materials that are liquid at unusually low temperatures. These materials manifest physiochemical behaviors quite unlike water or organic solvents. They possess high ionic conductivity, high ion concentrations, and excellent oxidative stability making them ideal materials for demanding applications at elevated temperature. Ionic Liquids have many applications, such as powerful solvents, electrolytes (electrically conducting fluids) and in power sources (batteries, capacitors, and fuel cells). In order to better understand the unique properties of ionic liquids we measured the Raman spectra of 1-butyl-3-methylimidazolium thiocyanate or [BMIM][SCN] in different environments. Raman spectra were correlated to the results of ab initio calculations. The data obtained will be discussed in terms of their implication to the function of ionic liquids.

Computational Studies and Raman Spectra of Ten Sulfa Drugs

Principal Investigator: Dr. Elmer-Rico Mojica
Co-Investigator(s): Alexis Javornik, Ashley E. Kuptsow, Maximillian P. Baria

Department: Physical and Chemical Sciences
School: Dyson College of Arts & Sciences
Campus: NYC

Sulfa drugs are commonly used in aquaculture as agricultural herbicides and in the treatment of respiratory and urinary tract infections in humans. These drugs remain one of the most popular active antimicrobial agents used in animal food production due to their relative low cost. The aim of the work is to identify chemical bonds, unique to the sulfa drugs, which are not only key in understanding its antimicrobial properties but will also provide a way to quantitate amounts of each drug in a given mixture. We applied computational methods to ten sulfa drugs, namely sulfamethazine, sulfamethoxazole, sulfachloropyridazine, sulfadimethoxine, sulfathiazole, sulfamerazine, sulfisoxazole, sulfamethizole, sulfameter, sulfadiazine and sulfadiazine. Results of the simulation studies were then compared to the measured Raman spectra of the ten sulfa drugs. Vibrational bands that are both unique and common to the sulfa drugs were identified. The data obtained will be discussed in terms of their implication to the function and the quantitative analysis of the sulfa drugs.

Vibrational Spectroscopy of Fluoroquinolone Antibiotics

Principal Investigator: Dr. Elmer-Rico Mojica
Co-Investigator(s): Ashley E. Kuptsow, Alexis Javornik, Maximillian P. Baria

Department: Physical and Chemical Sciences
School: Dyson College of Arts & Sciences
Campus: NYC

The fluoroquinolones are a family of broad spectrum, systemic antibacterial agents that have been used widely as therapy of respiratory and urinary tract infections. They are among the most commonly prescribed class of antibiotics in the United States and active against a wide range of aerobic gram-positive and gram-negative organisms. The aim of the work is to identify chemical bonds, unique to the fluoroquinolones, which are not only key in understanding its antimicrobial properties but will also provide a way to quantitate amounts of each drug in a given mixture. We applied computational methods to four antibiotics, namely ciprofloxacin, enrofloxacin, norfloxacin and sarafloxacin. . Results of the simulation studies were then compared to the measured Raman and IR spectra of the four drugs. Vibrational bands that are both unique and common among the four drugs were identified. The data obtained will be discussed in terms of their implication to the function and the quantitative analysis of the fluoroquinolones

Why we Text so Much: Psychometric Properties of the Messaging Motivations Questionnaire

Principal Investigator: Dr. Leora Trub
Co-Investigator(s): Jeremy Richards, Alyson Curtis, Jonny O'Hadi, Ana Lomidze, Samantha Slavkin, Baptiste Barbot

Department: Psychology
School: Dyson College of Arts & Sciences
Campus: NYC

As digital communication continues to rise, people feel less in control of their phone and texting behavior. Text messaging is now the preferred mode of communication for adolescents and many adults, and plays a key role in maintaining, managing and dismantling relationships. Despite its popularity, texting triggers feelings of pressure related to the high level of accessibility it involves. Texting impulsivity leads to serious consequences, for example impacts of sexting and increasing the chances of a car accident by 23 times for drivers who text. The ubiquitous and ever-increasing presence of the Internet in the lives of adolescents and young adults creates a critical need for better understanding of the underlying motivations that drive texting behaviors. Focus groups with undergraduate and masters-level students were used to develop 95 items aimed at assessing texting motivations through focus groups. These items were administered to 95 participants. Item analysis resulted in reduction to 56 items making up five factors. Ultimately, our goal is to arrive at a smaller pool of approximately 30 highly reliable and valid items that make up a series of factors that together comprise the construct of texting motivations. A valid and reliable measure of texting motivations will enable future research examining questions of what makes texting so appealing and how it is modifying the ways we feel about ourselves and others as technology becomes even more pivotal in our interactions. Secondly, Identifying individual differences in texting motivations provides a framework for creating interventions that work to increase awareness of self and other in text message-based interactions in attempt to encourage more thoughtful, honest, and safe communication.

Who Is Worthy of Protection? Gender-Based Asylum and U.S. Immigration Politics

Principal Investigator: Dr. Meghana Nayak

Department: Political Science
School: Dyson College of Arts & Sciences
Campus: NYC

Gender-based asylum is a strategy to allow asylum seekers who have experienced gender persecution to find safe haven in the United States. However, it matters not just that but how we respond to gender violence and persecution. Because "gender" is not one of the categories (such as race) of persecution in refugee law, asylum advocates and the U.S. government have created “frames,” which is an explanation of what violence is, what causes violence, and who counts as a victim of the violence. The use of these frames, in turn, may be used successfully to grant asylum to persecuted migrants; however, the frames are also very narrow and limited because the U.S. has to negotiate the tension between immigration restriction and human rights obligations to protect refugees from persecution. The effects of the asylum frames are two-fold. First, they leave out or distort the stories and experiences of multiple asylum seekers who do not “fit” the frames. Second, the frames reflect but also serve as an entry point to deepen, strengthen, and shape the U.S. position of power relative to other countries, international organizations, and immigrant communities. This book project explores the politics of gender-based asylum through a comparative examination of asylum policy and cases regarding domestic violence, female circumcision, rape, trafficking, coercive sterilization/abortion, and persecution based on sexual and gender identity.

Otherness in the International Relations Classroom: Critical Pedagogy's Transformational Potential

Principal Investigator: Dr. Meghana Nayak

Department: Political Science
School: Dyson College of Arts & Sciences
Campus: NYC

What happens when students and professors "recognize" themselves in the topics discussed in Global Politics courses? Such a recognition may happen when discussing migration, conflict, and nationalism. Using theories of critical pedagogy, this paper examines how the classroom can transform experiences of marginalization and distress into experiences of empowerment and visibility. Topics explored include the "us-them-over there" trope, academia as an institution of power, and social distance. This paper was inspired by discussions at international studies conferences about whether international relations, as a discipline, fully represents the variety of stories, people, and places in our world.

The Rise of the Renminbi from Convertible toWARD Reserve Currency Status as a result of the China-US Trade Relationship

Principal Investigator: Dr. Robert Vambery

Department: Marketing and International Business
School: Lubin School of Business
Campus: NYC

An increasing portion of China's international trade moved away from being denominated in US Dollars to being denominated in Chinese Renminbi. This is in part the result of China's many years of trade surpluses with the US which enabled the PRC to build a $4 trillion financial hoarding of hard currency assets. Though further reforms to its internal financial system need to be made before the Renminbi will be held in significant quantities by central banks, the acceptance of the Renminbi by a number of China's trading partners as a unit of account in trade reduces dependence on the Dollar in international trade. This paper examines some of the measures pursued by the PRC that enabled its currency to progress from inconvertibility to convertibility and now toward reserve currency status. It also examines some of the reasons for the relative decline in the Dollar's dominance. The paper concludes with findings on what both economic powerhouses should do to enhance their respective positions as they compete against each other in international trade.

Finding the Missing Papers: The Fate of Best Paper Proceedings Presented at AOM Conferences

Principal Investigator: Dr. Katherine M. Richardson
Co-Investigator: Hannah R. Rothstein (Zicklin School of Business, Baruch College, CUNY)

Department: Management & Management Science
School: Lubin School of Business
Campus: NYC

Publication bias is the tendency to publish a study depending on the direction and statistical significance of its results rather than on the basis of its theoretical or methodological quality. It poses a serious problem because, when the research that is readily available differs in its results from the results of all the studies that have been done in an area, readers and reviewers of that research are in danger of drawing the wrong conclusion about that body of research. To begin assessing how this problem might affect the management research literature, we surveyed 321 authors of the Best Paper Proceedings from the 1998, 1999 and 2000 Academy of Management conferences to find out whether the papers they presented were subsequently published. A total of 124 authors responded and reported that 91 papers (73%) were eventually published in academic journals. The average time to publication was 22 months. Nearly half of these papers (43%) included more or different data than what was described in the conference proceedings. The most common changes were the type of analyses conducted and the number of outcomes reported. Reasons why manuscripts were not accepted for publication included insufficient contribution to the literature, insufficient theory, poor fit with a journal and operational or design problems. We conclude that research results that appear in scholarly journals may be systematically unrepresentative of the population of completed studies.

The Role of Enterprise Social Media in Facilitating Knowledge Sharing and Collaboration for Innovative Outcomes

Principal Investigator(s): Dr. Julia Eisenberg, Dr. Jennifer Gibbs
Co-Investigator(s): Nik A. Rozaidi, Dr. Anna Gryaznova, Dr. Dina Nekrassova

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Department: Management & Management Science
School: Lubin School of Business
Campus: PLV

The aim of our project is to study the effects of technological affordances of Enterprise Social Media on the established relationships associated with internal knowledge sharing and collaboration for innovative outcomes. Our objectives include studying dynamics associated with collaboration practices among individuals who are geographically dispersed, culturally and functionally diverse, may have trouble communicating in non-written English, and may have weak or no relationship to each other prior to their interaction. Three global organizations have agreed to participate in this project. The first organization is a US based hardware and software development company that specializes in providing innovative IT solutions. The second organization is a US based global software solutions company with majority of their workforce spread out throughout Eastern Europe with multiple locations throughout the other regions. They provide innovative software solutions to global clients. The third organization is a Russian based telecommunications company that employs over 15000 employees. They are primarily based in their Moscow office with multiple locations throughout Russia. Multi method study: interviews, surveys, server log analysis. Team and organization level analysis.

BRIDGES: Building Resources Through Integrating Disciplines for Group Effectiveness in Science

Principal Investigator(s): Dr. Theresa Lant, Dr. Maritza Salazar

Department: Management & Management Science
School: Lubin School of Business
Campus: PLV

This study explores the impact of leader characteristics and behaviors on the innovativeness of interdisciplinary science teams. We predict that leaders with a breadth of education and work experiences in multiple disciplinary areas will have the integrative capability to help their teams develop research questions and approaches that draw on the diverse disciplinary perspectives of team members and yield innovative results. We posit that this relationship is driven by leaders' ability to garner commitment, which is a necessary condition for effective collaboration, from team members with varied disciplinary backgrounds. To test our predictions, we designed a cross-sectional survey and examined the relationship between leader characteristics (i.e., intrapersonal heterogeneity), members' attitudes (i.e., goal commitment) and performance outcomes (i.e., innovativeness). Survey data from 32 interdisciplinary medical research teams were used in combination with rosters providing demographic data about each team and expert ratings of team innovativeness. The results of this analysis support our predictions that leaders with greater breadth of experience foster greater team innovativeness, and, that this relationship is indirectly driven through team members higher level of commitment to group aims. In order to explore how these leaders foster commitment and innovation in interdisciplinary teams, we conducted a supplemental comparative case analysis of 5 teams. We recorded, transcribed, and analyzed meetings of these teams, with a particular focus on team leader communication behaviors. Mirroring the quantitative study, teams with leaders with a breadth of experience tended to develop knowledge outputs that integrated diverse perspectives and were more innovative than those teams led by a person without such breadth. Leaders with this integrative capability were more adept at striking a balance between depth (focus) and breadth (inclusiveness). This research also sheds light on a potential means through which a team's integrative capacity, the potential to combine interests of distinct disciplinary groups, can be enhanced to better accomplish joint work (Salazar, Lant, Fiore, & Salas, 2012[1]).[1] Salazar, M., Lant, T., Fiore, S., & Salas, E., (2012) Integrative Capacity: A New Perspective for Understanding Interdisciplinary Team Processes and Outcomes," Small Group Research. October 2012 vol. 43, no. 5; 527-558

A Study on the Employee Satisfaction Levels of some consultancy Firms in New York City

Principal Investigator: Dr. Shamira Malekar
Co-Investigator: Fredrique Zadi

Department: Management & Management Science
School: Lubin School of Business
Campus: NYC

This research is about a satisfaction survey that was conducted for the employees of some consultants in New York City. Our objective was to analyze their satisfaction levels with respect to identified factors like organization environment, work, communication system, compensation and benefits, values, management policies, performance management system, culture, commitment that form the integral part of their job responsibilities. The paper aims to understand the relationship between the some of the demographic factors (gender, designation, qualification, age, and years of Service) and satisfaction level. Other reasons of the study were to identify the reasons for the satisfaction and dissatisfaction amongst the employees and understand what is working "for and against" the consultants. With the help of this survey, some recommendations to improve the level of employee satisfaction could meet some current needs of consultancy firms.

Sex and Contract Law: A Case Study – Using the SUNY Definition of Affirmative Consent to Teach Contract Law

Principal Investigator: Professor Robert Wiener

Department: Legal Studies and Taxation
School: Lubin School of Business
Campus: NYC

On December 2, 2014, Governor Cuomo announced the SUNY sexual assault prevention and response policy. He is committed "to work to adopt the same standards legislatively for all of New York's colleges and universities," including Pace University. This paper uses case study analysis of the SUNY definition of affirmative consent not only "to combat sexual assault on our college campuses," but also as a case study tool for teaching the elements of contract law: contract formation, consideration, reality of consent (i.e., duress/coercion), legality, capacity (i.e., minority and intoxication), and writing.

Perceptions of Change in Virtual Classrooms on Ethical Decision Dilemmas

Principal Investigator: Dr. E. Susanna Cahn

Department: Management & Management Science
School: Lubin School of Business
Campus: PLV

A decision tree exercise was designed as a way of illustrating the possible disparity between profitable decisions and ethical decisions. An academic example was chosen to provide a quantifiable model familiar to students, involving the opportunity to cheat on a school assignment. It incorporates elements inherent in any decision involving a potential ethical dilemma: uncertainty or risk, rewards/penalties and a sense of right vs. wrong. The decision tree makes explicit the risk of being caught acting unethically and therefore receiving a penalty; there is a companion "risk" of not being caught and thereby receiving a reward. The example does not have a "right" answer because the solution depends on risks estimated as probabilities by the students doing the exercise. The risk values are subjective, estimated as a small group exercise. The decision tree makes explicit the effect of risk on the decision process. Solution of the decision tree indicates the strategy or decision that leads to the best expected payoff. As presented, the example presumes that the stated objective is to earn the highest grade possible (consistent with the business strategy of maximizing profits). Students then compare their solution for the stated objective with their sense of what the most ethical decision would be. Responses were collected for student groups who completed the exercise in 2001,2. They focused on the probability of being caught copying as the primary difference between a “real” classroom and a “virtual” classroom. Most of the groups expected the probability of being caught copying to be lower in a “virtual” classroom. A decade later, results for the same exercise were collected for groups of students in 2012,13. In the intervening decade, “real” classrooms and “virtual” classrooms had become less distinct with in-person classes taking on more hybrid characteristics, with some assignments submitted on line, and software available for matching texts to flag plagiarism. How did student perceptions of the difference between “real” and “virtual” classrooms change? Slightly more than half of the recent groups expected the probability of being caught copying to be higher in a “virtual” classroom.

Successes and Challenges of Implementing a Literacy Education Project in Rural Sierra Leone

Principal Investigator: Dr. Peter McDermott
Co-Investigator: Nancy Allen (University of Qatar)

Department: School of Education
School: School of Education
Campus: NYC

This paper examines the successes and challenges of implementing a teacher education project in rural Sierra Leone. Thirty school leaders participated in the project during which they attended workshops designed to improve methods of teaching literacy in their schools. Afterwards they taught the same literacy methods to teachers in their buildings. Using a mixed method design, multiple data sources were collected and analyzed. Although the project's long-term effects will not be known for some time, this study provides evidence of the following: (1) An immediate outcome of the project was that the school leaders' perceptions about how to teach reading and writing improved significantly over the course of the year; (2) The school leaders grew in their enthusiasm and commitment to improve literacy teaching in their regions and village; (3) They reported their workshops were positively received by participants in their rural schools; (4) Workshop activities that connecting to the school leaders' social and cultural experiences often produced rich and engaging learning activities. There is little doubt that educational reform in developing countries requires enormous financial and political support. Reform does not come easily when education has been underfunded for years and social infrastructures are fragile. We believe that initiating school reform by focusing on teacher knowledge, as this project has done, is a practical first step for improving literacy education in Sierra Leone's rural schools. The project represents one step among the many that are urgently needed to improve literacy education in Sierra Leone's schools. Sierra Leone's children have the right to have knowledgeable and well-prepared literacy teachers.

"Curriculum and Community Enterprise for New York Harbor Restoration in New York City Public Schools"

Principal Investigator: Dr. Lauren B. Birney
Co-Investigator(s): Dr. Jonathan H. Hill, Professor Samuel Janis, Dr. Brian Evans

Department: STEM Education & CSIS
School: School of Education
Campus: NYC & PLV

Research consistently shows that children who have opportunities to actively investigate natural settings and engage in problem-based learning greatly benefit from the experiences. They gain skills, interests, knowledge, aspirations, and motivation to learn more. But how can we provide these rich opportunities in densely populated urban areas where resources and access to natural areas are limited? This project will develop and test a model of curriculum and community enterprise to address that issue within the nation's largest urban school system. Middle school students will study New York harbor and the extensive watershed that empties into it, and they will conduct field research in support of restoring native oyster habitats. The project builds on the existing Billion Oyster Project, and will be implemented by a broad partnership of institutions and community resources, including Pace University, the New York City Department of Education, the Columbia University Lamont-Doherty Earth Observatory, the New York Academy of Sciences, the New York Harbor Foundation, the New York Aquarium, and others. The project focuses on an important concept in the geological, environmental, and biological sciences that typically receives inadequate attention in schools: watersheds. This project builds on and extends the Billion Oyster Project of the New York Harbor School. The project model includes five interrelated components: A teacher education curriculum, a student learning curriculum, a digital platform for project resources, an aquarium exhibit, and an afterschool STEM mentoring program. The project targets middle-school students in low-income neighborhoods with high populations of English language learners and students from groups underrepresented in STEM fields and education pathways. The project will directly involve over forty schools, eighty teachers, and 8,640 students over a period of three years. A quasi-experimental, mixed-methods research plan will be used to assess the individual and collective effectiveness of the five project components. Regression analyses will be used to identify effective program aspects and assess the individual effectiveness of participation in various combinations of the five program components. Social network mapping will be used to further asses the overall "curriculum plus community" model.

Comparing Teachers' Experiences in Same and Mixed-Age Preschool Classrooms

Principal Investigator: Dr. Raquel Plotka

Department: School of Education
School: School of Education
Campus: NYC

Theorist and researchers have mixed opinions and findings regarding the role of mixed-age classrooms in preschool. According to Piaget (1932), interactions with peers of the same-age are preferable, since same-age children are more likely to have similar skills. However, Vygotzky (1978) believed that interaction with children of different ages provides an optimal context for development, as both older and younger children gain from the opportunity to scaffold and being scaffold. Studies have found that greater variance in age composition results in negative outcomes for children in cognitive, motor, and social development (Moller, Forbes-Jones, & Hightower, 2008). Yet, studies have also found that young children benefit in social and language development from interaction with older children, and older children benefit socially from the opportunities for leadership (Moller et al., 2008). Few researchers had attempted to answer this question by exploring the experiences of preschool teachers. The present study aims a addressing whether mixed or same-age classroom status affects teachers' experiences of problem behaviors in the classrooms and teachers' needs of new strategies to handle conflict, and whether teachers vary in their disciplining behaviors and their goals based on classroom age composition. Data from 267 teachers placed in 3, 4, and mixed 3 and four-year-old classrooms, serving economically disadvantaged children in urban preschools was analyzed. The results of a multivariate analysis of variance show a significant multivariate difference among teachers in mixed-age classrooms and same-age classrooms (Roy's Largest Root = 0.07, $F(5, 261) = 3.64$, $p = 0.003$). Teachers in mixed-age classrooms experienced lower levels of needs for new strategies to handle conflict ($F(1, 266) = 9.92$, $p = .002$), and used significantly lower levels of negative disciplining behaviors ($F(1, 266) = 6.13$, $p = .01$). Additionally, teachers in mixed-age classrooms placed significantly higher value on the goal of fostering assertiveness in young children ($F(1, 266) = 3.86$, $p = .05$), and experienced a trend towards lower levels of problem behaviors ($F(1, 266) = 3.41$, $p = .06$). These results inform theory and practice regarding the role of mixed-age classrooms in preschool settings, and are unique because the data is driven by teachers' experiences.

The Effects of Preschool Teachers' Perceptions of Children Problem Behaviors on Teachers' Sense of Self-Efficacy

Principal Investigator: Dr. Raquel Plotka
Co-Investigator: Dr. Emily Lichvar

Department: School of Education
School: School of Education
Campus: NYC

Teachers' self-efficacy to address problem behaviors in preschool classrooms is central to children's behavioral and academic outcomes (Gebbie, Ceglowski, Taylor, & Miels, 2012). Teacher's perceptions of problem behaviors in the classroom, teachers' behavioral expectations of children, and teachers' negative disciplinary strategies might play a key role in teachers' self-efficacy. Teachers' perceptions of problem behaviors are not always accurate, and agreement on children's behaviors among teachers is achieved about 36% of the time and this variation in teachers' perceptions may be influenced by their personal biases (Arnold & Dobbs, 2013). When teachers perceive children's behavior as problematic they are more likely to use negative disciplinary strategies (Zhang & Sun, 2013). Since negative disciplinary strategies are ineffective at regulating children's behaviors (Webster-Sratton, 1999), it is hypothesized that teachers who perceive high levels of problem behaviors in their preschool classroom will also experience low levels of efficacy. In addition, teachers who have negative perceptions of children's behaviors tend to develop lower academic and behavioral expectations of those children (Dobbs & Arnold, 2009). Low expectations can result in low levels of self-efficacy, as teachers with low expectations feel that children's limitations affect their effectiveness (Rashid, 2009). This study proposes that teachers' perceptions of problem behavior in children might result in teachers using negative disciplinary strategies, which will cause low levels of teacher's efficacy. Similarly, teachers' perception of problem behavior in children might result in lower behavioral expectations, which will affect teacher's self-efficacy. Participants were three-hundred-and-thirty Head Start teachers serving children ages 2-5 in a large U.S. city. The results from a path analysis show that controlling for children's age, the perception of problem behaviors had a significant effect on teachers' self-efficacy (Estimate = .22, p = .001). In addition, perception of problem behaviors predicted higher levels of negative disciplinary strategies (Estimate = .13, p = .001), and negative disciplinary strategies resulted in lower levels of teachers' self-efficacy (.15, p = .02). Perceived problem behaviors did not predict teacher's behavioral expectations, and teacher's expectations did not predict teachers' self-efficacy. According to Kenny's specifications (2010) this model has good fit (RMSEA = .05, 90% CI of .00 - 12). Teachers' perceptions of children's behaviors and teacher's negative disciplinary strategies affect teachers' self-efficacy. Results inform educational interventions for preschool teachers, such as teacher education and professional development.

Syncretic Narratives of Multilingual Children: Implications for Academic Literacy Development

Principal Investigator(s): Dr. Raquel Plotka, Dr. Xiao-lei Wang

Department: School of Education
School: School of Education
Campus: NYC & PLV

Children's narrative skills have long been identified as playing an important role in academic achievement, not only as an explicit part of school curriculum (e.g., classroom narratives or writing), but also as foundational abilities for later literacy development (Uccelli and Páez, 2007). Research has shown that narrative abilities are one of the best predictors of literacy success in schools (Nelson, 2010). However, few studies have so far explored the everyday narratives of multilingual children. The purpose of this study is to examine multilingual children's everyday spontaneous narratives in the home context. In particular, this study investigates whether multilingual children produce syncretic narratives (creative use of language by drawing resources from different languages). Eight children from four multilingual families (mean age = 8.13) participated in the study. The genders of the children consist of 3 boys and 5 girls. Among the participants, 4 were Spanish-English speakers and 4 were Chinese-English-French speakers. The naturalistic interactions of the children with their parents or grandparents were video-recorded. The spontaneous narratives of the children were transcribed verbatim and coded with a scheme developed by Plotka and Wang (2014). The results suggest that multilingual children's narratives are never pure linguistic events. Instead, these narratives are organized on the basis of the integration of a child's cultural beliefs and values. Multilingual children tend to incorporate more than one set of cultural values, beliefs, emotions, practices, identity, and linguistic conventions into the organization of their narratives. In other words, when different cultural and linguistic systems interact, children rarely simply replace one linguistic system with the other, but their narratives tend to reflect the integration of more than one system. Children draw from their existing pool of languages and come up with creative narratives. Implications for how teachers can help multilingual children develop their classroom narratives, including writing narratives are discussed.

Adult Promotion of Children Narratives through Participatory Prompts: Implications for Literacy Development

Principal Investigator(s): Dr. Raquel Plotka, Dr. Xiao-lei Wang

Department: School of Education
School: School of Education
Campus: NYC & PLV

Children narrative skills play an important role in academic achievement and literacy development (Fivush, Haden & Reese, 2006). Research stresses the importance of adults promoting narrative skills by asking "wh" questions including who, what, and why in order to elicit children conversations about past events (Ruse, Leyva, Sparks, & Grolnick, 2010). However, few studies have focused on the effects of adults prompting conversations about past events by becoming participants in these narratives. The purpose of this study is to examine the role of adult "participatory prompts" as effective ways of promoting children's narrative skills in the home context. Two fathers, three mothers, and two grandmothers and six children (five girls and one boy; mean age = 6.7) participated in the study. The naturalistic interactions between adults and children were video-recorded, transcribed, and coded based on a scheme developed by Plotka and Wang (2014). The results suggest that when adults used "participatory prompts", such as encouraging children to discuss shared experiences (e.g. "remember when we…?") and using first-person remarks (e.g. "I can't believe it!"), children produced more complex narratives about past events than when adults used "wh" questions without participatory prompts (e.g. what did you do today?). Implications for how teachers and parents can foster children's narrative skills are discussed.

Re-Engagement for Learning: A Study of Etutoring in Content Area Instruction

Principal Investigator: Dr. Francine Falk-Ross

Department: School of Education
School: School of Education
Campus: PLV

This research project describes the efficacy of the components of an online literacy afterschool tutoring practicum/program to address the needs of academically marginalized students, sidelined in the classroom due to a lag in reading level due to learning difficulties and linguistic differences. Graduate-level literacy education majors directed lesson planning for tutoring sessions through 1-hour, bi-weekly online synchronous tutoring sessions. The development of assessment and instruction was guided by the course instructor through review of lesson plans and during conferencing opportunities. Analysis of teachers' reflective comments in field notes were completed using open and then axial (reductive) coding to discover and categorize trends and relationships in teachers' thoughts. Results indicated advantages for students of two models of online tutoring instruction. The finding that the environment and instruction is as important as the delivery model is supported by research articulated in the theoretical framework. The efficacy of good teaching and the promise and possibilities of tutoring online are also supported by previous research, in general, although the findings of this study point to the specifics of home versus school-situated environments for online tutoring. The power of the study is that this will impact the achievement of struggling learners (ELL, LD, SLD) through interventions with language and literacy principles that underlie all of these competencies. The significance of this study is that precedents for the use of videoconferencing for teaching may serve as a model for future more global collaborations between teachers and schools.

Beliefs about Social Justice among Elementary Mathematics Teachers

Principal Investigator: Dr. Brian Evans

Department: School of Education
School: School of Education
Campus: NYC

The purpose of this study was to measure teacher beliefs about social justice over the course of an elementary mathematics teaching methods course. The participants in the study came from three unique groups of in-service and preservice teachers in a master's degrees program at a medium-size university in New York: New York City Teaching Fellows (NYCTF), Teacher Education Assessment and Management (TEAM) program, and traditional preservice teacher preparation program. Findings revealed that while there were no differences in beliefs over the course of the semester, NYCTF teachers had more positive beliefs about social justice than did TEAM teachers. Teachers felt most positively about incorporating diverse cultures and experiences into classroom lessons and discussions; self-examination of attitudes and beliefs about race, class, gender, disabilities, and sexual orientation; and teaching students to think critically about government positions and actions.

A Case Study on Empowering a Non-Profit Organization to Help People with Disabilities through m-Health Device Technologies

Principal Investigator: Dr. James P. Lawler
Co-Investigator(s): Sami Benson, Hannah Moller, & Robert Salloum

Department: Information Technology
School: Seidenberg School of CSIS
Campus: NYC

Local non-profit organizations are constrained in developing efficient methods for helping people with disabilities confined at their houses. The cost of labor of physically serving such people is a continued issue at the organizations. This study, engaging undergraduate students of Pace University one-on-one with people with disabilities at their houses, explored an entrepreneurial focus on best-in-class applications of m-Health devices – fitness, generic health, life monitoring / medication monitoring, nutrition and weight – for improving methods of home medication support furnished by a leading metropolitan non-profit organization. Estimates for applications (apps) of m-Health devices are forecasted to be increasing from $5.7 billion in 2013 to $12.6 billion in 2018. The students inquired into the feasibility of functionality of the m-Health technology, learning the motivations of the people to be independently proficient with the new technology, and the feasibility of innovation in new wearables for the quality of life of the people. The study explored further the potential of hosted infrastructure-as-a-service (IaaS) m-Health remote monitoring systems and tele-medicine technology furnished by industry technology firms. The potential of products in smart houses or residences, in interoperability with m-Health tools, is highly promising for people with or without disabilities. The findings of the research study – non-profit organizations can improve their care of people with disabilities in their houses with investment in a limited number of best-in-class m-Health platform tools extended to a larger population with a device management model for privacy and security - can benefit mental health professionals, non-profit organizational researchers and service staff considering economic entrepreneurial innovation in interactive managed care technology. Overall, the study offers a foundation for a larger study by more undergraduate students, partnered with people with disabilities, in learning the potential of m-Health technology with a neglected population of society.

Evaluating a Pilot Inclusion Initiative for Higher-Functioning Individuals with Developmental and Intellectual Disabilities at a Postsecondary Institution of Higher Learning

Principal Investigator: Dr. James P. Lawler
Co-Investigator(s): Hope Goldfard, Jamie DeJesus, Tiki Lipton and Adil Sanai

Department: Information Technology
School: Seidenberg School of CSIS
Campus: NYC

Postsecondary education options continue to expand for higher-functioning individuals with developmental and intellectual disabilities (IDD) having aptitude and exceptionally high interest in the options. The authors of this research study evaluate a pilot inclusion initiative, in which individuals with disabilities of a major non-profit organization having individualized education plans (IEP) and person-centered plans are involved in courses at a metropolitan institution of higher learning. The dual focus of the study is on the benefits of the initiative for the individuals with disabilities, in learning outcomes and in overall outcomes in job-oriented positions in industry, and for students without disabilities, in mentoring the individuals with disabilities. The study is evaluating further the impacts of extra-curricular events of sociality on the individuals with disabilities. The preliminary findings of the study highlight increased learning and sociality of the individuals with developmental and intellectual disabilities and increased potential for meaningful positions. The findings of focus groups from the study highlight increased learning and monetary opportunities for disability-sensitive psychology and sociology students without disabilities mentoring the individuals with disabilities, in internship and matriculated non-profit organizational positions. The students without disabilities have had opportunities for socialization with their paired individuals, the families of the individuals with disabilities, and the non-profit organizational staff. Importantly, the preliminary findings indicate that inclusion initiatives for less impaired individuals with developmental and intellectual disabilities benefit not merely the community service goals of the postsecondary institutions but help more in the retention of students. The authors note other opportunities for postsecondary institutions from Transition and Postsecondary Programs for Students with Intellectual Disabilities (TPSID) through the Higher Education Opportunity Act (HEOA) of 2008. Overall, this research study of the authors will benefit administrators and instructors in postsecondary institutions considering expanding inclusion programs for higher-functioning people with disabilities and involving students without disabilities not only with neglected populations but with marketable opportunities and pronounced skills in public service.

Secondary School Exit Examination Passes in English Language and Mathematics

Principal Investigator: Dr. Anthony Joseph

Department: Computer Science
School: Seidenberg School of CSIS
Campus: NYC

Globalized knowledge economy. The annual percentage pass rates in these subjects were studied relative to English B, biology, chemistry, and physics. These data obtained from the Ministry of Education archive, covered 11 schools from 1986 -- 2011, were processed for descriptive and inferential statistics. The main findings showed that English A and mathematics had almost equal pass rates in 1986. Since then their rates dramatically diverged, trended in opposite directions with moderate and significant correlation. Moreover, the all-girl schools out-performed the all-boy and mixed gender schools in English A and mathematics. The related subjects' performances were between those of English A and mathematics and also trended positively. An implication of this study is that with the annual improvement in student performance in all subjects except mathematics, the Antigua and Barbuda seems to have generally established the foundation for national development at the post- secondary educational and training levels. However, its declining performance in mathematics is a concern that not only needs to be reversed but assume a positive trend to better position the island nation for sustainable economic growth in a globally competitive science technology, engineering, and mathematics (STEM) driven society.

Energy-Aware Real-Time Data Allocation for Heterogeneous Embedded Systems

Principal Investigator: Dr. Meikang Qiu

Department: Computer Science
School: Seidenberg School of CSIS
Campus: PLV

Embedded systems are everywhere in our everyday lives and driving an information revolution. With more and more different types of functional units (FUs) available, same type of operations can be processed by heterogeneous FUs with different costs, where the cost may relate to power, reliability, etc. In another aspect, some tasks may not have fixed execution time. Such tasks usually contain conditional instructions and/or operations that could have different execution times for different inputs. Therefore, for such special purpose architecture synthesis, an important problem is how to assign a proper function unit type to each operation of embedded systems and generate a schedule in such a way that the total costs can be minimized while satisfying timing constraints with guaranteed confidence probabilities. Several efficient algorithms with dynamic programming approach have been proposed to solve this problem. Furthermore, I explore heterogeneous memory architecture with the aid of scratch-pad memory (SPM) for embedded systems. I use multi-dimensional dynamic programming approach on data allocation to reduce total memory access costs, such as data allocation latencies and energy consumption. The experiments demonstrate the effectiveness of the algorithms.

Using a 3D Real-time model for Navigation and Human Activity Comprehension

Principal Investigator: Dr. David Paul Benjamin
Co-Investigator: Yue Hong

Department: Computer Science
School: Seidenberg School of CSIS
Campus: NYC

Robots are needed that can help people perform tasks in settings that are dangerous or repetitive and dull, in the home or the hospital or factory. This requires sophisticated human-robot interaction in which the robot can comprehend and predict human motions, and plan responses that are cooperative and avoid harm. We are developing a highly accurate physically realistic simulator coupled with stereo vision for 3D modeling and navigation that enables a robot to model and respond to human movements. The resulting system will be fast and will use relatively inexpensive equipment. The main research objectives of the project are to demonstrate the efficient use of stereo vision to recognize objects, people and motions and render them accurately into the simulator, and demonstrate the use of a 3D simulator with realistic physics to navigate and generate task plans. The primary goal of this project is to demonstrate smooth interaction and cooperation with humans and other robots in a range of settings. The settings to be used include navigating alongside a walking person, navigating through walking people, and crossing a busy street while avoiding moving vehicles. This project is part of a large multi-university multidisciplinary collaboration spanning more than ten years. The ADAPT project (Adaptive Dynamics and Active Perception for Thought) is a collaboration of three university research groups at Pace University, Brigham Young University, and Fordham University to produce a robot cognitive architecture that integrates the structures designed by cognitive scientists with those developed by robotics researchers for real-time perception and control. Our goal is to create a new kind of robot architecture capable of robust behavior in unstructured environments, exhibiting problem solving and planning skills, learning from experience, novel methods of perception, comprehension of natural language and speech generation.

Building a Realistic Testbed for Developing and Evaluating Cyber Security Systems

Principal Investigator: Dr. David Paul Benjamin
Co-Investigator: Taranjyot Multani

Department: Computer Science
School: Seidenberg School of CSIS
Campus: NYC

New cyber attacks of increasing complexity are being created continually, and are met with increasingly complex methods of defense. These defensive methods are often deployed on large networks after brief tests on networks that are much smaller, due to the costs of using a large real network for development. This hinders the development and evaluation of effective defense methods. This is especially true when the network includes a large number of mobile nodes, which is increasingly common, and as networks are expanded to include physical devices and sensors of a great variety. We are developing a sophisticated testbed that can be used to develop and test large complex heterogeneous networks in a completely realistic manner. Our testbed is named RBG (Realistic Behavior Generator). RBG is a real network, just without the physical boxes for the machines and the physical bodies of the users. RBG generates realistic traffic and supports and measures the effects of real attacks. This provides the advantages of a real network without the associated costs, and can provide datasets from a variety of networks.

The Affordable Care Act and the Constitutionality of Federal Telemedicine Licensure Reform

Principal Investigator(s): Dr. Amar Gupta, Bill Marino, Roshen Prasad

Department: Computer Science, Information Systems
School: Seidenberg School of CSIS
Campus: NYC

The proliferation of telemedicine remains encumbered by a fragmented, state-based system of licensing telemedicine professionals. Federal-level reforms of this system have been proposed. But the constitutionality of such reforms has been unclear. Recent legal challenges to the Affordable Care Act (ACA), however, may have reshaped the constitutional positioning of this issue. The viability of federal telemedicine licensure reform in light of these recent court decisions was researched and a paper was produced. This paper has been accepted for publication by Columbia Law School's Science and Technology Law Review.

Web Application Security: Setting Controls and Evaluating Results

Principal Investigator(s): Dr. Catherine Dwyer, Dr. Susanne O'Callaghan, Anthony Martini, Preston Rollins, Nachiket Pingle, Chinmay Juneja

Department: Computer Science, Information Systems, & Accounting
School: Seidenberg School of CSIS & Lubin School of Business
Campus: NYC

This project focuses on Web application security and the need for a more rigorous approach to managing risk. Our multi-disciplinary team combines a Seidenberg faculty member, a Lubin faculty member, two MS in computer science students, and two MS in Information Systems students. Web application security is close to a crisis point, similar to the crisis faced by the financial industry in 2008. Exploits and hacking episodes are nearly daily occurrences (for example the Sony hack, Anthem Health Insurance, Home Depot and Target). Web applications are software that run in a Web browser. Web applications support the ability for readers to post comments, enable the functionality within Google docs, and support many of the functions found in e-commerce sites. Since the browser runs the code, any weaknesses in the installed version of the browser can be exploited by bad actors. The first commercial browser, Netscape Navigator, was released just over 20 years ago. The browser is a relatively immature product when it comes to identifying risk and mitigating application weaknesses. A contributing factor for this problem is the economic model for browsers, which are distributed for free, but have potential revenue tied to setting search engine defaults. With the current business model, there is little incentive to support finding and patching security vulnerabilities. The purpose of this research is to use the methodology developed by the accounting profession to manage financial risk to improve Web application security. The accounting profession developed mechanisms for managing financial risk through the establishment of internal controls and verification through audits. When looking at financial risk, accounting takes a system level view as to certifying that adequate controls are in place. These requirements are spelled out in the COSO framework. They include Control Procedures, Risk assessment, Information and Communication, Monitoring, and a Control Environment. Without all five elements in place, the company is at risk for fraud or other financial problems. Web application security needs to take a similar systemic approach, in order to bring under control the scale of security risks on the Web. This requires the establishment of security standards, verification of Web application development tools, and the identification of preventative controls that stop attacks as they begin.

An Exploratory Study of IT Demand and IT Hardware Production: A Country-Level Analysis

Principal Investigator: Dr. Namchul Shin
Co-Investigator: Jason Dedrick (Syracuse University)

Department: Information Technology
School: Seidenberg School of CSIS
Campus: NYC

As the IT industry has globalized, IT hardware production has shifted from advanced economies to newly emerging economies, then to developing countries. Producers in newly industrializing economies (NIEs) and developing countries work closely with multinational corporations that coordinate value chains to serve global markets. They serve growing local IT demand as well. While there has been much research on global value chains, quantitative research investigating what determines IT hardware production at the country level has been scant. To address this gap, this research examines empirically factors influencing IT hardware production by employing a country-level data set for the period from 1985 to 2009. Our results show that greater domestic IT demand is associated with greater IT hardware production in NIEs and developing countries, but not in advanced economies. IT hardware exports have strong positive relationships with IT hardware production, and the relationship is greater for NIEs and developing countries than for advanced economies. These findings suggest that IT hardware production in NIEs and developing countries is highly driven by global demand, while some of the increase in IT hardware production in large NIEs is partly due to the trend to locate IT hardware production in fast-growing markets. Our results also show that GDP per capita has a strong negative relationship with IT hardware production and that the pattern of migration from wealthier countries to lower income countries is noticeable in more recent years. This findings are consistent with the phenomenon that IT hardware production has migrated to the regions where wage levels are low.

Developing Mobile Applications for Underserved Populations

Principal Investigator: Dr. Jean F. Coppola
Co-Investigator(s): Martine Nezerwa, Keith Wright, Jacob Fried-Stahl, Tony Chen, Nivedita Joshi, Stefan Howansky, Jake Terranova, Chris Carlson

Department: Information Technology
School: Seidenberg School of CSIS
Campus: NYC & PLV

Mobile application development is an exciting area for students, as well as industry. Whether one aspires to code the next Facebook, Instagram, or other killer app, most companies will focus on developing apps for their day-to-day business. Since fundamental knowledge of mobile application development is crucial for today's successful computer science student, they need to understand their targeted audience, as well as usability and functionality for the selected population. In mobile app development, there is a great number of potential users that could be easily overlooked. Often, app developers design and create for the younger population, that is, users who are already tech savvy that can easily pick up on the functionality of an app. However, there are additional populations that could benefit from using the different applications which are easy to navigate and help with daily activities. Developers need to also keep in mind designing for the physically and cognitively impaired users, e.g., special audiences such as older adults, children, etc. Thus, in today's world it is crucial for the programmers of tomorrow to be aware of conceiving mobile applications with a universal design. The Pace Mobile app team specializes in researching and developing mobile apps for those forgotten and underserved populations. The team is composed of students with diversified skills sets where the students bring their multiple talents to learn application development by tackling real-world problems in an interdisciplinary field. The students learn a lot from these practical projects because they get to see the impact they are making as they go from text-book to real experiences outside the classroom. The team is currently researching and creating mobile applications that are targeted for Alzheimer's / dementia (AD) patients, Multiple Sclerosis (MS) patients, Cerebral Palsy, and their caregivers. Examples include: Pictural and Memory Box are being designed for AD patients to serve as a foundation for reminiscence therapy through the use of familiar pictures and family photos/voices. Injectify is an app targeted for MS patients and other users that need to monitor where on their body medications were injected. Silver Cross is a caregiver app that is designed to lessen their caregivers' burden by allowing them to easily keep track of basic things that are related to the person they are caring for. Student designs are based on research and interactions with focus groups to incorporate the needs of the populations via primary sources.

Human Mobility during Religious Festivals in Senegal: An Orange Mobile Dataset Analysis

Principal Investigator: Dr. Christelle Scharff
Co-Investigator(s): Meghan Jordan, Khadidiatou Ndiaye (George Washington University), Aminata Niang Diene (University of Cheikh Anta Diop of Dakar (UCAD), Fatou Maria Drame (Gaston Berger University)

Department: Computer Science
School: Seidenberg School of CSIS
Campus: NYC

Mobile phone records (phones calls and SMS) are particularly useful to study human mobility. We used the 2013 mobile phone records released by the Orange Senegal mobile operator as part of the 2014 Data for Development (D4D) Challenge to model human mobility before, during and after two key Senegalese religious festivals that were attended by millions of Muslims: Gamou of Tivaouane for followers of the Tijaniyya brotherhood and Magal of Touba for the followers of the Mouridiyya brotherhood. To study the correlation between human mobility and health issues, we also secured access to health data collected through a toll free hotline service (Numéro Vert) of the Senegalese Ministry of Health. We produced models and animated map visualizations (in CartoDB) of human mobility based on volumes of incoming and outgoing communications in the cities of Tivaouane and Touba. We mapped the phones calls to the Numéro Vert, plotted the frequency of calls, and summarized the reasons of the calls. We found patterns in the human mobility data showing that these festivals imply massive movements of population from different parts of Senegal depending on the festival and permitting to identify the interconnectedness of communities. Our analysis also showed the main routes used by the pilgrims and their travels' times. While we did not find significant patterns in the health data, it is important to understand the reasons and origins of the calls to the Numéro Vert and integrate it as a tool for health awareness campaigns before and during the festivals and beyond. These findings will be worthwhile for numerous institutions, including the ministries of Transport, Health, and Hydraulic, as well as other stakeholders planning future religious festivals. They have important implications ranging from resource management to service allocation and awareness campaigns during religious festivals in Senegal.

Sexual Orientation and College Students' Nonmedical Use of Prescription Drugs

Principal Investigator: Dr. Richard Shadick
Co-Investigator(s): Dr. Faedra Backus Dagirmanjian, Dr. Leora Trub, Dr. Heather Dawson

Department: Counseling Center
School: Administration
Campus: NYC

The current study addresses gaps in the literature on lesbian, gay, bisexual, and questioning college student non-medical use of prescription drugs (NMUPD). A large sample of first year university students was surveyed to determine whether sexual orientation predicted rates of NMUPD. Three thousand, four hundred and fifty-one students in an introduction to college course filled out questionnaires on demographic variables and NMUPD. Overall prescription drug use was examined as were the following classes – stimulants, benzodiazepines, and painkillers. Students identifying as bisexual reported the highest levels of use of stimulants and benzodiazepines (about three times more likely than heterosexual students), followed by gay- and lesbian-identified students (about one and a half times more likely). For painkillers and overall NMUPD, bisexual students (about three times more so than heterosexual students) and questioning students (about two and a half times more so than heterosexual students) were more likely to have significantly higher rates of use than heterosexual students and gay men. Additionally, when compared to heterosexual females, females identifying as lesbian, bisexual and questioning were significantly at risk for elevated use. These findings suggest that there may be particular risk for NMUPD associated with membership in marginalized groups in terms of both sexual orientation and gender. This extends previous literature on elevated substance abuse in lesbian, gay, bisexual, and questioning populations.

Emotional Intelligence: The Key to Retention and Graduation?

Principal Investigator: Dr. Richard Shadick
Co-Investigator(s): Dr. Jennie Sharf, Dr. Brian Petersen, Jennifer Trujillo-Armijo

Department: Counseling Center
School: Administration
Campus: NYC

Previous research has shown that teaching elementary and middle school children about emotional intelligence has significant and positive effects upon academic and psychological functioning. Among other outcomes, students exposed to a curriculum embedded with the emotional intelligence concepts of self-awareness, self-regulation, empathy, and social skills tend to have fewer emotional problems and disciplinary issues, and they achieve better grades and graduate at higher rates (e.g., Medland & Stachnik, 1972; Brackett, 2014). Unfortunately, there has been no known research to apply this model to college students. The Counseling Center staff, in collaboration with the Yale Center for Emotional Intelligence, has begun to develop a curriculum for use in first year college classes. In this poster, highlights of the curriculum will be presented and suggestions will be made as to how faculty can incorporate elements of the program to meet their educational and co-curricular (e.g., Pace Path) goals.

NYS Office of Victim Services: Bilingual Paralegal for Family Court Legal Program

Principal Investigator(s): Executive Director Jane Aoyama-Martin, Esq.
Co-Investigator(s): Tracey Alter, Esq.

Department: Women's Justice Center
School: Pace Law School
Campus: PLV

The New York State Office of Victim Services, under the Victims of Crime Act (VOCA), offered grant funding for programs that provide victim assistance services, with domestic violence as a priority area. Pace Women's Justice Center (PWJC) received funding to augment the work of our highly successful Family Court Legal Program (FCLP). FCLP operates on-site, walk-in offices on the premises of the White Plains and Yonkers Family Courthouses to offer free legal assistance to victims and survivors of domestic violence. The program is designed to address the immediate legal needs of victims who are in an urgent abusive situation, by providing access to judicial protections. PWJC staff attorneys, assisted by pro-bono attorneys and law students, represent clients in family offense proceedings for emergency orders of protection, petitions for temporary child custody, and petitions for child and spousal support. The program also provides referrals to other victim service providers who can assist with other urgent needs such as shelter, health care, public benefits and counseling. FCLP serves nearly 1000 victims and survivors of domestic violence each year. The new funding from the Office of Victim Services will provide for the cost of a full-time, bi-lingual (English/Spanish) paralegal, since over 50% of FCLP clients are Latino. This additional staff person will enable PWJC to better serve clients with limited English proficiency, as well as those who prefer to discuss sensitive issues in their native language. FCLP strives to break down the barriers to coming forward for victims of domestic violence: legal services are free, easily accessible without an appointment, and provide immediate and often same-day protections. Providing services in Spanish helps to remove an additional barrier for many victims. The bi-lingual paralegal also will expand our services to all of our clients, by providing assistance to victims of abuse who may qualify for compensation from the NYS Office of Victim Services. Qualified victims may seek reimbursement for certain expenses, including among other things, lock replacement, property damage and medical expenses not otherwise covered by insurance. This service will be one of the first steps our clients can take to recover financially from the effects and damages caused by their abuser. Our experience has shown, and research has corroborated that access to legal services is one of the most important factors in helping victims break free of their abusers and to safely move forward with their lives.