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Present

NORTHEASTERN ILLINOIS UNIVERSITY FIFTH ANNUAL FACULTY RESEARCH & CREATIVE ACTIVITIES SYMPOSIUM

November 14, 2014

Northeastern
ILLINOIS UNIVERSITY

Participants

College of Arts & Sciences
College of Business & Management
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Isaura Pulido, College of Education
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Angela Vidal-Rodriguez, McNair Scholars Program

SYMPOSIUM PROGRAM

8:00 – 8:30 AM Registration/Coffee
Student Union, First Floor

8:30 – 8:50 AM Program Commencement
Alumni Hall

Welcome and Introduction
Dr. John Albazi, Symposium Coordinator

Greetings
Dr. Sharon K. Hahs, President
Northeastern Illinois University

This year's Symposium is sponsored by the Office of Academic Affairs and the College of Arts and Sciences.

Track 1
Session A
Student Union (Golden Eagles Room SU 103)
Presiding: Cynthia Moran (Department of Communication, Media, and Theatre)

9:00 AM "FINDING CONTEMPORARY RELEVANCE IN A ROMANTIC PERIOD TELLING OF THE HERO'S JOURNEY, AS CREATED BY JOHANNES BRAHMS IN *DIE SCHÖNE MAGELONE*, OPUS 33 (1869)" (page 10), Robert Heitzinger, D.M., Department of Music

9:40 AM "NUCLEAR POLICY: ARTIFACTS OF THE COLD WAR" (page 11), Nate Mathews, Department of Art

10:20 AM "TOO MUCH OF A GOOD THING: MOTHERHOOD IN THE PLAYS OF MARGARET SANGER'S *THE BIRTH CONTROL REVIEW"* (page 12), Angela Sweigart-Gallagher, Department of Communication, Media, and Theatre

11:00 AM *"DESIGNER GENES:* PROJECT DRIVEN STUDENT LEARNING INTEGRATING COMMUNICATION CONCEPTS, TEACHING STRATEGIES, AND COLLABORATIVE PLAYWRITING" (page 13), Written and Directed by Jim Blair, Department of Communication, Media, and Theatre

11:40 AM Lunch Break

Track 1
Session B
Student Union (Golden Eagles Room SU 103)
Presiding: Cynthia Moran (Communication, Media and Theatre)

12:30 PM "A PERFORMANCE OF ORIGINAL AND TRADITIONAL SONGS IN THE FOLK TRADITION" (page 14), James A. Lucas, Professor Emeritus of Music

1:10 PM "SACRED SPACES GREEK AND ROMAN THEATRES" (page 15), Ann B Hartdegen Department of Communication, Media, and Theatre

1:50 PM "GLITCH ART (AND MY MANIFESTATIONS THEREOF)" (page 16), Paul Lempke, Department of Art

2:30 PM "LATIN AMERICAN CINEMA'S MULTIPLE MODERNITIES" (page 17), Paul A. Schroeder Rodríguez, Department of World Languages and Culture

Track 2
Session A
Student Union (SU 214)
David Rutschman (College of Arts and Sciences)

9:00 AM "H5N1 AVIAN INFLUENZA ENTRY: UNCOVERING SIALIC ACID'S POTENTIAL COFACTOR" (page 18), Mairead O'Connor-Maleney[5], Rifka Joly[2,3], Leekita McCorker[4], Emily Rumschlag Booms*[1,3]. [1]Department of Biology, [2]Department of Chemistry, [3]Northeastern Illinois University, Chicago, IL 60625, [4]Illinois State University, Normal, IL 61761, [5]Indiana University, Bloomington, IN 46202

9:40 AM "UNIFYING PREDATOR AND PARASITE ECOLOGY USING AN EMPIRICAL TEST OF FUNCTIONAL RESPONSE MODELS" (page 19), Sarah A. Orlofske*[1], Robert C. Jadin[1], Maxwell B. Joseph[2]. [1]Department of Biology, Northeastern Illinois University, [2]Department of Ecology and Evolutionary Biology, University of Colorado Boulder

10:20 AM "USING WORMS TO UNDERSTAND HUMAN NEURODEGENERATIVE DISEASES" (page 20), Cindy Voisine*, Quan Nguyen, Emily Rendleman, Zelene Figueroa, Deelegant Robinson, Nathan Park, Anthony Salamanca, Anthony Harshman, and Nazish Muzaffar, Department of Biology

11:00 AM "THE DROSOPHILA WERNER EXONUCLEASE PARTICIPATES IN AN EXONUCLEASE-INDEPENDENT RESPONSE TO REPLICATION STRESS" (page 21), Elyse Bolterstein*[1,2], Rachel Rivero[2], Melissa Marquez[3], Rob Salomon[4], Mitch McVey[2]. [1] Department of Biology, Northeastern Illinois University; [2] Department of Biology, Tufts University; [3] Mount St. Mary's College; [4] Tufts University, School of Medicine

11:40 AM Lunch Break

Track 2
Session B
Student Union (SU 214)
Erick Howenstine (Geography and Environmental Studies)

12:30 PM "SOCIAL BEHAVIOR, STRESS, ANXIETY, AND DOPAMINE: IT IS A COMPLICATED RELATIONSHIP" (page 22), Shannon Saszik, Department of Psychology

1:10 PM "INVASIVE PLANTS THAT HYBRIDIZE: CHALLENGES IN CATTAIL IDENTIFICATION AND IN ESTIMATING HYBRIDIZATION RATES" (page 23), Pamela Geddes, Department of Biology

1:50 PM "INTEGRATING GEOGRAPHIC INFORMATION SYSTEMS AND REMOTE SENSING FOR LAND CHANGE ANALYSIS IN AN URBAN AREA" (page 24), Ting Liu, Department of Geography and Environmental Studies

2:30 PM "THE PARADOX OF COBENEFITS: COOPERATION, IMPLEMENTATION, AND THE COSTS OF ISSUE LINKAGE" (page 25), Caleb Gallemore, Department of Geography and Environmental Studies

Track 3
Session A
Student Union (SU 215)
Chandana Meegoda (Chemistry Department)

9:00 AM "PEAK FORCE QUANTITATIVE NANOMECHANICAL PROPERTY MAPPING: A USER-FRIENDLY APPROACH TO ATOMIC FORCE MICROSCOPY" (page 26), Rima Rebiai1, Marie E. Kroeger2, Zain Malik[1], Emina A. Stojković[2], Stefan Tsonchev[1], and Kenneth T. Nicholson*[1]. [1]Department of Chemistry, [2]Department of Biology

9:40 AM "APPLICATION OF NMR IN CHARACTERIZATION OF ARSENOPLATINS – INORGANIC ANTICANCER AGENTS BASED ON THE COMBINATION OF PLATINUM AND ARSENIC DRUGS" (page 27), Denana Miodragovic*[1,2], Josh Kurutz[2], Charlotte Stern[2], and Thomas O'Halloran[2]. [1]Department of Chemistry, Northeastern Illinois University, [2]Northwestern University, Evanston, IL

10:20 AM "DESIGN AND SYNTHESIS OF NEW SMALL-MOLECULE ELECTRON-ACCEPTING MATERIALS FOR APPLICATION IN ORGANIC ELECTRONICS" (page 28), Ali Reza Mohebbi*, Fred Wudl, Department of Chemistry

11:00 AM "MASTERY AND WIKIS, TRANSITION TIME? MOVING TOWARD STUDENT CENTER LABS" (page 28), Sandra Neri[1], Ngan Tran[1], Thach Nguyen[1], Courtney Moran[2], and Ana Fraiman*[1]. [1]Chemistry Department, [2]Biology Department

11:40 AM Lunch Break

Track 3
Session B
Student Union (SU 215)
Presiding: Rasoul Razvanian (Accounting, Business Law and Finance)

12:30 PM "CONCEPTUAL FRAMEWORK FOR CONTEXT DISCOVERY AND ADAPTATION" (page 29), Hong Andy Chen, Accounting, Business Law & Finance

1:10 PM "GLOBAL STOCK MARKET MOVEMENTS BASED ON INVESTORS 'FEAR

GAUGE" (page 31), Hardik Marfatia, Department of Economics

1:50 PM "OPENNESS AND MACROECONOMIC VOLATILITY: DO DEVELOPMENT FACTORS DRIVE SUCH AMBIGUOUS RESULTS?" (page 31), Scott W. Hegerty, Department of Economics

2:30 PM "THE SCIENCE OF CONSCIOUS LIVING" (page 32), Stephen Grove, MBA, Leadership, Management, Marketing, Economics and Theology

Track 4
Session A
Student Union (SU 216)
Alberto Lopez (College of Education)

9:00 AM "EVALUATION OF A NEW MODEL OF RETENTION IN A COMMUTER-STUDENT POPULATION" (page 33), Hoa Khuong, Institutional Research and Assessment

9:40 AM "ENGAGING DIFFERENCE IN U.S. UNIVERSITY CLASSROOMS TO PREPARE GLOBAL CITIZENS" (page 34), Wilfredo Alvarez, Department of Communication, Media, and Theatre

10:20 AM "RIGHT FROM THE START: TEACHER STUDENT RELATIONSHIPS AND THE TRANSITION TO HIGH SCHOOL" (page 36), Andrew Brake, Department of Social Work

11:00 AM "INFUSING DISABILITY CONCEPT INTO PHYSICAL EDUCATION TEACHER EDUCATION PROGRAM" (page 37), Eun Hye Kwon, Department of Health, Physical Education, Recreation, and Athletics

11:40 AM Lunch Break

Track 4
Session B
Student Union (SU 216)
Isaura Pulido (President's Office)

12:30 PM "PROMOTING PRESERVICE TEACHERS' INQUIRY AND COMPUTATIONAL THINKING USING SCRATCH" (page 38), Hanna Kim*, Department of Teacher Education, Rachel F. Adler, Department of Computer Science

1:10 PM "UTTERANCE FLUENCY AND COGNITIVE FLUENCY OF ENGLISH LANGUAGE LEARNERS" (page 39), Jimin Kahng, Department of Teaching English as a Second/Foreign Language

1:50 PM "THE IMPACT OF SERVICE LEARNING AND CRITICAL REFLECTION ON STUDENT PECEPTIONS OF BEHAVIORAL AND AFFECTIVE LEARNING: A LONGITUDINAL STUDY" (page 40), Nanette Potee, Department of Communication, Media, and Theatre

Track 5
Session A
Student Union (SU 217)
Presiding: Theophilus Okosun (Justice Studies)

9:00 AM "THE FREQUENCY OF DETERMINER ELEMENTS IN CROW NOUN PHRASES" (page 41), Lewis Gebhardt, Department of Linguistics

9:40 AM "LANGUAGE CHOICE, CODESWITCHING AND LATIN@ IDENTITY" (page 42), Shahrzad Mahootian, Department of Linguistics

10:20 AM "HOW THE SHAH'S IMPERIAL ARMY FAILED TO PROTECT THE PAHLAVI DYNASTY IN 1979" (page 44), Mateo M. Farzaneh, Department of History

11:00 AM "HOW INTERNATIONAL LEADERS OVERCOME DIFFICULT SOCIAL CONDITIONS AND MOVE BEYOND THEIR LOCALITY: AN EXPLORATORY STUDY OF BIOGRAPHY AND LEADERSHIP DEVELOPMENT" (page 45), Wojciech Wloch, Ed.D. Candidate, Office of International Programs

11:40 AM Lunch Break

Track 5
Session B
Student Union (SU 217)
Presiding: Kim Sanborn (Nontraditional Degree Programs)

12:30 PM "ON THE SADNESS OF ANTONIO AND THE HATRED OF SHYLOCK: SHAKESPEARE SHOWING US WHY THINGS HAPPEN" (page 45), Charles Nissim-Sabat, Professor Emeritus of Physics, Northeastern Illinois University

1:10 PM "TEAM-TEACHING AS A MODE OF TEXTUAL PRODUCTION: TEACHING *AS* WRITING, WRITING *IN* TEACHING" (page 46), Christine Simokaitis, Olivia Cronk, Department of English

1:50 PM "INTERPRETING AMBIVALENCE: UNDERSTANDING STUDENT IDENTITY CONFLICTS THROUGH STORIES OF LITERACY" (page 48), Timothy Barnett, Departments of English and Women's & Gender Studies

2:30 PM "DIS-ALIENATING THE NEIGHBORHOOD: MISTER ROGERS' MARXIST VISION OF LOVE AND WORK" (page 49), Tim Libretti, Department of English

Track 6
Session A
Student Union (SU 218)
Presiding: Lidia Filus (Mathematics)

9:00 AM "A GENERALIZED SPIN-STATISTICS THEOREM" (page 50), Paul O'Hara, Department of Mathematics

9:40 AM "SUBSPACE STRATEGY IN MATRIX COMPUTATION" (page 50), Zhonggang Zeng, Department of Mathematics

10:20 AM "TUMOR MORPHOLOGICAL STABILITY: A MODEL BASED ON PHYSICAL PROPERTIES AND CELLULAR MICROENVIRONMENT" (page 51), Emma Turian, Department of Mathematics

11:00 AM "THE MATH COMPONENT OF THE EMERGE SUMMER PROGRAM: SUPPORTING INCOMING FRESHMEN IN MATH DEVELOPMENT COURSEWORK" (page 52), Sarah Oppland-Cordell*, Katherine Bird*, Joseph Hibdon*, Stevan Ranney*, and EMERGE Panel*, Department of Mathematics

11:40 AM Lunch Break

Track 6
Session B
Student Union (SU 218)
Presiding: Saba Ayman-Nolley (Psychology)

12:30 PM "THE EFFECTS OF REAL WORLD AND ONLINE INTERPERSONAL CONNECTEDNESS ON DEPRESSION AND SUICIDAL IDEATION AMONG YOUNG ADULTS" (page 53), Christopher Merchant, Department of Psychology

1:10 PM "EXPLORING THE ROLE OF PARENTING IN THE DEVELOPMENT OF CHILD SELF-REGULATION: EARLY ATTACHMENT AS A MODERATING VARIABLE" (page 54), R. Birmingham*, Department of Justice Studies, Northeastern Illinois University, K. Bub, Department of Educational Psychology, University of Illinois Urbana-Champaign

1:50 PM "EXPLORING COLLEGE STUDENTS' NATURE OF SCIENCE VIEWS AND THEIR EPISTEMOLOGIES RELATED TO LEARNING SCIENCE" (page 55), Huseyin Colak, Department of Educational Inquiry and Curriculum Studies

2:30 PM "IMPLEMENTING CONCEPTUAL THEORIES OF MOTOR SKILL LEARNING TO THE INSTRUCTION AND ASSESSMENT PROCEDURES UTILIZED IN ACADEMIC CORE SUBJECTS" (page 56), Tom Parry, Department of Health, Physical Education, Recreation, and Athletics

ABSTRACTS OF PRESENTATIONS

NEIU FIFTH ANNUAL
FACULTY RESEARCH & CREATIVE ACTIVITIES SYMPOSIUM

NOVEMBER 14, 2014

Northeastern Illinois University
Chicago, Illinois 60625

FINDING CONTEMPORARY RELEVANCE IN A ROMANTIC PERIOD TELLING OF THE HERO'S JOURNEY, AS CREATED BY JOHANNES BRAHMS IN *DIE SCHÖNE MAGELONE*, OPUS 33 (1869)

Robert Heitzinger
Music
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The tale of the hero's journey is as old as mankind; examples are evident in every culture and are a basic tenet of the human psyche. Cave paintings depict humans hunting and overcoming animals, Jason and the Argonauts set out on an impossible journey and Walt Disney films such as *Aladdin* paint a romanticized version of the hero. In *The Hero with a Thousand Faces*, Joseph Campbell states that the "hero ventures forth from the world of common day into a region of supernatural wonder: fabulous forces are there encountered and a decisive victory is won: the hero comes back from this mysterious adventure with the power to bestow boons on his fellow man".

This is the story of Die schöne Magelone, first written in the 15th century by an anonymous French author as *Ystoire you chevalier Pierre felt you vaillant conte de Provence et de la barks Magueone*. Veit Warbeck did a German translation in 1527, and it was this version that Ludwig Tieck used in 1797 to create *Wundersame Liebesgeschichte der schönen Magelone und des Grafen Peter aus der Provence. Johannes Brahms read this as a young man and was familiar with the tale of Count Peter of Provence, who sets out to make his fortune, finds and loses Magelone, suffers hardships and is finally reunited with her.*

Tieck's method of storytelling involves prose to move the story forward while poetry is used to reflect on the emotional state of the character. When setting the poetry, this method creates problems for a song composer, since the connection between songs is not evident. Contemporary audiences are no longer familiar with this story, so narration is frequently used to relate the necessary details.

This presentation will use printed musical examples, spoken texts, art work and audio recordings to explore how Brahms shaped his extended song cycle to reveal that rather than one hero, there are two, for Magelone is equally active in this tale. It is she who suggests that they elope, setting the stage for the tragedy that follows. Brahms' musical resources are complex and varied. The voice and piano lines will be examined to show how Brahms creates melodic lines that outline the hero's character and emotion. In addition, rhythmic and harmonic devices will be studied to give further detail. While most

of the songs are in Peter's voice, one pivotal work shows the depths of Magelone's anguish.

Die schöne Magelone is a rarely performed work that deserves to be rediscovered. Present day audiences should reacquaint themselves with the archetypal characters that inhabit its world.

NUCLEAR POLICY: ARTIFACTS OF THE COLD WAR

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During the 1950's the U.S. government was hard at work building top-secret facilities for many purposes relating to the cold war. Initially the facilities were designed for defense of bomber attacks, but as technology progressed the government built massive bunkers designed to survive nuclear attack, silos for intercontinental ballistic missiles, and a national communications network to activate the military in the case of a nuclear attack.

Over the past two years I have been photographing many of the Nike missile defense sites in the Chicago area, the congressional fallout shelter built under the Greenbrier Resort Hotel in West Virginia, and landscapes of North and South Dakota that are home to hundreds of intercontinental ballistic missiles.

Nike missiles were designed to be surface to air defense missiles with a short range to defend major metropolitan areas from the threat of Soviet bombers. What remains today at most of these sites is empty fields or park that retain the Nike name. However, a small number of these sites have partial structures such as radar towers or blast doors that cover the missile storage bunkers.

The Greenbrier Bunker in White Sulphur Springs, West Virginia was the site of one of the largest bunkers/fallout shelters in America. This bunker is significant because it was designed to house all members of congress in the event of an attack (1,500 people). The bunker was secretly built between 1958-1961 under a new addition to the Greenbrier Hotel. The bunker was kept secret to the public for thirty years. Now the facility is used to house computer servers, but daily tours are offered to select areas of the bunker.

At one time there were six fields each housing one hundred and fifty ICBM missile silo's

spread throughout the Great Plains. As part of a non-proliferation agreement with the Soviet Union, the U.S. destroyed 300 ICBM silos and 30 underground launch control capsules. To protect the missile fields and the country from Soviet attack, the government constructed the Stanley Mickelson Safeguard Complex close to the Canadian border in North Dakota. The complex was designed to target, track, and destroy incoming missiles with defensive sprint missiles.

My intention with these photographs will be to show the depth in which the government was prepared for an attack, the secretiveness in which these sites were funded, constructed, and often hidden in plain sight. My presentation will include images that I have made, historic images and satellite maps, my experiences when visiting these sites, and other relevant facts from my research.

TOO MUCH OF A GOOD THING: MOTHERHOOD IN THE PLAYS OF MARGARET SANGER'S *THE BIRTH CONTROL REVIEW*

Angela Sweigart-Gallagher
Communication, Media, and Theatre
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Motherhood, both actual and symbolic, was central to Margaret Sanger's appeal to readers of the *Birth Control Review (BCR)* when she edited the magazine from 1917-1929, and it remained a central trope within its pages until the magazine stopped publishing in 1940. In its first year, the magazine ran with the motto, "Dedicated to the principal of intelligent and voluntary motherhood." While *TBCR* clearly had as its mission to limit the number of children women conceived, it did so by consistently aligning birth control with notions of motherhood, particularly "good" motherhood.

The *BCR* aligned its mission with motherhood through drawings of mothers with their child(ren) and a letter to the editor section billed as "Appeals of/from Mothers." It also published short stories, poems, and short plays that brought the experience of mothers to its readers more vividly than its frequent articles by various experts on the broad societal dangers of failing to allow women to voluntarily become (or not become) mothers. In this paper, I examine several short plays published in the pages of *TBCR* such as Mary Burrill's *They Sat in Darkness* and *Children* by Coralie Haman, exploring the way each deploy and respond to the "performance" of motherhood presented in the pages of *TBCR*. I contextualize my discussion of each text within the broader frame of the birth control debate and in the particularities of the issue in which it was featured

and discuss how motherhood and maternity serves as a source of conflict for the characters within each play and for the broader society during the time period.

In the very first issue of *Birth Control Review* Margaret Sanger, Frederick Blossom, and Elizabeth Stuyvesant address the "Men and Women of the United States" in order to articulate the mission and rationale for the *BCR*. In that they describe birth control as the "most vital issue facing the country to-day (sic)" (*BCR*, February 1917, 3). They go on to write:

> This Review comes into being, therefore, not as our creation, but as the herald of a new freedom. It comes into being to render articulate the aspiration of humanity toward conscious and voluntary motherhood. (*BCR*, February 1917, 3).

The concept of "voluntary motherhood," a phrase that biographers argue Sanger borrowed from the fellow feminist Emma Goldman, anchored Sanger's arguments about birth control and formed the core argument of the plays published within the *Birth Control Review*—that women should be able to choose when and how to become to mothers.

DESIGNER GENES: **PROJECT DRIVEN STUDENT LEARNING INTEGRATING COMMUNICATION CONCEPTS, TEACHING STRATEGIES, AND COLLABORATIVE PLAYWRITING.**

Jim Blair
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Designer Genes is a one act drama which explores family history, family secrets, sibling rivalry, a seemingly unresolvable conflict, and communication issues. Playwriting is the perfect vehicle for confronting internal and external conflicts through dramatic dialogue. The two character (two brothers) drama is an interdisciplinary experience integrating theater, history, science, psychology, and communication concepts and strategies, and serves as a catalyst, which helps the two brothers explore their jealousies, fears, and history of conflict.

This drama has already received a Stage Center Theater reading August 15, 2014. Feedback was excellent, which has encouraged me to pursue the production of this one act drama and also to share it with NEIU students, faculty, and staff. Having it presented at the Symposium will offer my students this opportunity. This is important because as a final theater/communication project students will be required in groups of

three to compose an original scene based on one of our six course texts highlighting communication concepts they have learned in this co-taught, two course (Introduction to Communication and Introduction to Theater) College of Arts and Sciences Education Program (CASEP) section; therefore, their final project will contain and highlight concepts learned in both courses. Not only will they write this original scene, memorize the script, and employ props and costumes, they will also perform it in Northeastern's Stage Center Theater, where it will be videotaped. At the end of the semester each student will receive a DVD, which includes –not only their specific performance--but the performances of all of their classmates.

In conclusion, the goal of this presentation and our students' projects is to encourage pre-service teachers to implement dramatic strategies, role playing, and arts integration in their own classrooms when they become teachers. Research strongly indicates that employing drama, role playing, and arts integration in a classroom in all subject areas is a powerful tool for student academic engagement and achievement and affords students the opportunity to create their own knowledge base. This in turn builds confidence, encourages collaboration, and increases student learning and achievement. Project driven learning helps students to internalize and recall concepts, transfer learning from one subject area to another and serves an excellent strategy for building a foundation for life-long learning.

A PERFORMANCE OF ORIGINAL AND TRADITIONAL SONGS IN THE FOLK TRADITION

James A. Lucas
Music
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The project will be a performance of original and traditional songs in the folk music tradition. The songs will be performed by Dr. Lucas, singing and playing harmonica, and his colleague guitarist/vocalist Mike Jones. Together, they perform regularly with the Muscovy Ducks in monthly performances at Tapas 7232 in Forest Park, at open mics, and other venues.

Description of Exemplar Arrangements and Original Songs:

The songs and arrangements are all from the folk music tradition. They were created, arranged, learned, and transmitted in jam sessions and classes at the Old Town School of Folk Music in Chicago. The folk music tradition is one that carries on the music and

performance styles of music that is not written by composers, but more properly is passed on from person to person via aural methods.

The songs, in their order of performance, are:

The Retiree Blues (by James Lucas)
The Criminal Waltz (traditional Cajun song, with new lyrics by James Lucas)
You Can Love Yourself (by Keb' Mo')
Polly Anne (traditional song, with new lyrics by James Lucas)
Walkin' By Myself (by Jimmy Rogers)
Fifty-One Ford (lyrics by James Lucas, music based on a study by David Barrett)

SACRED SPACES
GREEK AND ROMAN THEATRES

Ann B Hartdegen
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I was 17 when I stood in a Greek theatre for the first time. I was overwhelmed by the natural beauty of the setting, the ancient rocks with their message from so long ago, and the sheer scale of the architecture. Last spring I finally stood in the best preserved Roman theatre on the world in Aspendos, Turkey. In the intervening (almost 50!) years I took an ndergraduate degree in classics, a graduate degree in theatre and, as often as I could, travelled back to Greece and Italy to remember and to marvel again. In 2005 I was awarded a full year sabbatical and, with the advent of digital cameras, I was at last able to capture some of the majesty that had enraptured me as a teenager. In productions as diverse as ANTIGONE, LYSISTRATA, THE BIRDS, and MILES GLORIOSUS these pictures have been used as projected scenery, and classes I teach on theatre architecture and history have been enhanced by pictures worth a thousand words.

The proposed presentation is a pictorial overview of Greek and Roman theatre architecture, with a particular focus on how theatres originally built by the Greeks were remodeled by the industrious Romans. It is accompanied by a PowerPoint with diagrams of the of the basic architecture of classical theatres, but also many pictures of theatres from my travels, including:

Theatre of Dionysus, Athens, Greece, 6^{th}-5^{th} century BCE, remodeled 4^{th} century AD

Theatre at Epidaurus, Greece, c 360 BCE
Theatre at Delphi, Greece, c 350 BCE
Theatre at Argos, Greece, c 320 BCE, remodeled c 120 AD
Theatre at Aigeira (Egira), Greece, c 300 BCE, remodeled c 120 AD
Theatre of Zea at Piraeus, Athens, Greece, c 300 BCE?
Theatre at Taromina, Sicily, c 265 BCE, remodeled c 100 AD
Theatre at Siracusa, Sicily, c 230 BCE, remodeled c 150 AD
Theatre of Priene, Turkey, c 200 BC, extensively remodeled 250 AD
Theatre at Pompeii, Italy, c 200 BCE
Theatre of Ephesus, Turkey, c 100 BCE, extensive remodeling c 200 AD
Odium at Pompeii, Italy, c 75 BCE
Theatre at Ostia Antica, Rome, Italy c 12 BCE
Theatre at Fiesole, Florence, Italy, c 100 AD
Theatre of Hieropolis, Turkey, c 100 AD, extensively remodeled c 200 AD
Theatre of Herodus Atticus, Athens, Greece, c 175 AD
Theatre of Aspendos, Turkey, c 160-180 AD, subsequent remodeling

In theatre education we frequently point out the huge influence of classical Greek theatre on the theatre we make today, both the physical architecture of our spaces and the literary structure of our plays. More than just knowing about the significance of classical theatres, I want my students to be AMAZED by them. Last spring, when I finally got to Turkey and saw the scaenae frons I had read about for so many years, I was just as enthralled as I had been at 17.

GLITCH ART (AND MY MANIFESTATIONS THEREOF)

Paul Lempke
Art
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I will purposefully quote Wikipedia on the subject of Glitch Art: “Glitch art is the aestheticization of digital or analog errors, such as artifacts and other “bugs,” by either corrupting digital code/data or by physically manipulating electronic devices.”

There is a history throughout the 20th Century (now considered a long history) considering random or unexpected juxtapositions or results to be valid and interesting phenomenon for artistic consideration. From considerations of chance by Dadaist Hans Arp that “can be experienced only in a total surrender to the unconscious,” to the

processed disruptions adapted by writer William S. Burroughs with his cut and paste methods.

Loss of control began to be seen as acceptable in painting, when paint drips began to be seen as process rather than flaws. The introduction of digital techniques, processes, and communication has allowed for ever more interesting failures of representation.

Glitch art is a very current trend in New Media Art – especially in Chicago, due in a large extent to the work of faculty at the Art Institute of Chicago.

I propose live demonstrations of common glitch art techniques as well as a unique take on this medium that has informed my most prolific work to date. There are disruptive manipulations of data and of process that can create unexpected and sometimes beautiful, sometimes intriguing visual work.

One of my most prolific lines of work began as a classroom exploration of a common mistake in executing a simple custom brush in Adobe Illustrator. It piqued my interests in that it combined the concept of recursion which incorporated self-similarity and total unexpected chaos. My goal became one of taming that chaos while retaining the symmetry of self-similarity.

This presentation will have a live demonstration of hex editing corruption, which is a standard disruptive technique as well as a demonstration of my recursive technique of a brush re-drawing itself in Adobe Illustrator. I go further along this line to show custom software that uses animation to explore this relationship over time.

LATIN AMERICAN CINEMA'S MULTIPLE MODERNITIES

Paul A. Schroeder Rodríguez
World Languages and Cultures
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Significance of the project: Latin American cinema is a contested site where several master narratives of modernity have been competing for the hearts and minds of spectators for over a century. Three of these master narratives—liberalism, socialism, and corporatism, also known as the 'three ways'—have been dominant at one time or another, and share a common belief in modernization as the inevitable and desirable triumph of instrumental reason. These three ways are normally understood as political discourses, yet they grow out of and evolve within a broader context of historically

determined cultural practices and values, so that it is possible to speak of the culture of liberalism, of socialism, and of corporatism, each with its own distinct narrative and set of values. **Research objective:** In this talk I will map the representation of these three cultures of modernity—plus that of a fourth, neobaroque version that radically challenges the values and assumptions of the three dominant discourses—through five distinct periods of narrative cinema in the region: silent cinema, studio cinema, the transitional 1950s, New Latin American Cinema, and contemporary cinema. **Methodology:** The talk will combine comparative modernity studies, with its broad understanding of modernity in the plural as the crystallization of economic, political, and cultural institutions into different configurations; and film studies' focus on the complex interaction between films' production, reception, distribution, exhibition, aesthetics, and ideology. **Summary of results and conclusion:** Narrative cinema is especially well suited for a comparative study of the representation of multiple modernities in Latin America because each major period in Latin American cinema is closely aligned with a specific discourse of modernity: the silent period coincides with the consolidation of oligarchic liberalism from Mexico to Argentina; studio cinema with the widespread adoption of a corporatist model of modernization; the militant phase of the New Latin American Cinema with the crystallization of the socialist discourse of modernity in the region; and the neobaroque phase of the New Latin American cinema with the search for radical alternatives to dominant discourses of modernity.

H5N1 AVIAN INFLUENZA ENTRY: UNCOVERING SIALIC ACID'S POTENTIAL COFACTOR

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Influenza A viruses pose a serious global health threat due to their ability to change receptor tropism and cross the species barrier from birds to humans. Once the species barrier has been crossed, the virus can gain the capacity to pass easily from human to human, potentially leading to an epidemic. The H5N1 avian influenza virus is a prime example of such changes and is predicted to cause the next global influenza pandemic. H5N1 avian influenza emerged in 1997 in China and has continued to reemerge since 2003. To cross the species barrier, the viral surface glycoprotein hemagglutinin (HA)

must be able to utilize the appropriate host cell receptor(s). The only known receptor for influenza is sialic acid (SA), which is a nine carbon monosaccharide terminally linked to host cell surface glycoproteins and glycolipids. While SA is thought to be important for viral entry, recent research suggests the presence of a co-factor. Specifically, target cells lacking glycoconjugates still support influenza entry as well as cells with an abundance of SA do not support influenza entry. To study the potential presence of a co-factor, we performed a series of lectin neutralization assays to block the interaction of HA with SA. Lectins are nonenzymatic carbohydrate-specific binding proteins. By blocking the HA:SA interaction, we can assess the level of viral entry and thus, the presence of a co-factor. If the virus still gains entry, it must be using something other than SA. We have demonstrated that blocking SA does not block viral entry, suggesting the presence of a co-factor. In addition, we generated mutations in HA's sialic acid binding domain to disrupt the use of sialic acid as a receptor. We then produced viruses that contained either wild type HA or mutated HA, and compared levels of viral entry. Our preliminary analysis shows that single mutants (E190A and L194A) had comparable levels of viral entry to wild type HA. While these single mutations are not believed to have fully disrupted the HA:SA interaction, they do support that a partial loss of interaction does not have a significant effect on influenza entry. Confirming the presence of and identifying the co-factor(s) in influenza entry will provide a novel target for therapeutic development.

UNIFYING PREDATOR AND PARASITE ECOLOGY USING AN EMPIRICAL TEST OF FUNCTIONAL RESPONSE MODELS

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Many important diseases of humans and wildlife are caused by parasites with complex life cycles requiring a series of hosts necessary for parasite development and reproduction. Examples are the human blood fluke, *Schistosoma mansoni* that infects more than 200 million people, and Echinostomes and *Ribeiroia ondatrae* that are pathogenic parasites of amphibians. These trematode (flatworm) parasites are transmitted to different hosts in the life cycle by aquatic, free-living infective stages called cercariae. However, cercariae are imbedded within a larger community of organisms, including juvenile fish and aquatic invertebrates, which may prey upon them subsequently reducing the number of parasites infecting the target host and causing pathology. Previous research has shown that both aquatic invertebrates and vertebrates

consume *Echinostoma trivolvis* and *Ribeiroia ondratae* cercariae but an important knowledge gap is whether these predators can consume a sufficient number of parasites to regulate the total parasite population and therefore transmission. The overall objective of this research is to develop and test mathematical models that represent mortality of parasites due to predators to combine with models describing parasite transmission. Specifically, biologists have developed theoretical models of functional response to describe the effect of prey abundance on the consumption rate of the predator for free-living systems. Importantly, these functions represent unique consequences for prey populations. Using this foundation we developed mathematical models of functional response incorporating prey depletion and conducted small-scale laboratory experiments with two types of predators, laboratory raised Western Mosquitofish (*Gambusia affinis*) and field-collected larval damselflies (*Ishnura* spp. and *Enallagma* spp.), and Echinostome and *R. ondatrae* cercariae. Juvenile mosquitofish were highly effective predators of both species of parasites consuming nearly 100% of the parasite-prey at all densities examined. This suggests that the functional response is linear or still in the linear portion of a more complex function. Larval damselflies also exhibited a linear response to increasing *R. ondatrae* density, although the response was more variable across individuals. Overall, the damselflies consumed 3-90% of the *R. ondatrae* cercariae across the range of densities. Based on these preliminary results we suggest that predators are capable of consuming high numbers of parasites in high-density laboratory experiments. Therefore, predators may be capable of consuming high numbers of parasites in nature. Future directions for this research include quantifying parasite densities in the field and comparing predation of parasites by these predators to predation on typical free-living prey. Overall this research contributes to understanding how biodiversity, including predators, may function to mediate transmission dynamics and characterize more fully the role of parasites in predator diets, food web relationships, and ecosystem energetics.

USING WORMS TO UNDERSTAND HUMAN NEURODEGENERATIVE DISEASES

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Neurodegenerative diseases are both devastating and puzzling. Amyotrophic lateral sclerosis (ALS) is a fatal neurodegenerative disease characterized by the progressive loss of motor neurons, leading to paralysis and death typically within 2-5 years of onset. In certain familial and sporadic cases of ALS, mutations in TDP-43, a gene that encodes

an RNA-binding protein, have been linked to ALS however the pathological mechanisms of TDP-43 are unclear. Protein aggregates containing TDP-43 have been detected in affected tissues. In its mutated form, TDP-43 becomes inappropriately cleaved, leaks into the cytoplasm of neurons and acquires a toxic gain-of-function. The toxicity may be caused by TDP-43 protein misfolding, and the accumulation of these nonfunctional proteins may form into insoluble aggregates resulting in neuronal dysfunction. Cells have evolved a quality control system that monitors and keeps protein production in check resulting in a properly folded proteome. Disruption of the cellular protein folding balance may be associated with TDP-43 aggregation and neurodegeneration. To systematically examine the relationship between the ALS-associated TDP-43 protein and disease pathology, we have established a disease model in the nematode *Caenorhabditis elegans. C. elegans* provides an excellent model system to address the mechanism of TDP-43 neurotoxicity. This model organism is highly amenable to genetics and the development and homeostasis of its nervous system has been well characterized. Our model expresses the human TDP-43 gene in all *C. elegans* neurons. Well-characterized behavioral assays that monitor neuronal function are being utilized to determine if our ALS worms recapitulate disease pathology. Our data show that expression of human TDP-43 in the *C. elegans* neurons has significant, detrimental effects on worm motor neuron and sensory neuron function. To explore whether these deficits are a result of neurodegeneration we introduced a red fluorescent protein reporter into GABAergic motor neurons and the AWC chemosensory neurons. Microscopy was used to visualize and compare the neuronal health of neurons in TDP-43 animals to wild type, revealing degeneration of the neuronal processes of sensory neurons. Taken together, we anticipate that TDP-43 is disrupting a fundamental process shared by all neurons, possibly the quality control mechanisms preventing protein aggregation. Our future experiments will assess whether aggregation of TDP-43 correlates with loss of neuronal function.

THE DROSOPHILA WERNER EXONUCLEASE PARTICIPATES IN AN EXONUCLEASE-INDEPENDENT RESPONSE TO REPLICATION STRESS

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Members of the RecQ family of helicases are known for their roles in DNA repair, replication, and recombination. Mutations in the human RecQ helicases, WRN and

BLM, cause Werner and Bloom syndromes, which are diseases characterized by genome instability and an increased risk of cancer. While WRN contains both a helicase and an exonuclease domain, the Drosophila melanogaster homolog, WRNexo, contains only the exonuclease domain. Therefore the Drosophila model system provides a unique opportunity to study the exonuclease functions of WRN separate from the helicase. We created a null allele of WRNexo via imprecise P-element excision. The null WRNexo mutants are not sensitive to double-strand break-inducing reagents, suggesting that the exonuclease does not play a key role in homologous recombination-mediated repair of DSBs. However, WRNexo mutant embryos have a reduced hatching frequency and larvae are sensitive to the replication fork-stalling reagent, hydroxyurea (HU), suggesting that WRNexo is important in responding to replication stress. The role of WRNexo in the HU-induced stress response is independent of Rad51. Interestingly, the hatching defect and HU sensitivity of WRNexo mutants do not occur in flies containing an exonuclease-dead copy of WRNexo, suggesting that the role of WRNexo in replication is independent of exonuclease activity. Additionally, WRNexo and Blm mutants exhibit similar sensitivity to HU and synthetic lethality in combination with mutations in structure-selective endonucleases. We propose that WRNexo and BLM interact to promote fork reversal following replication fork stalling and in their absence regressed forks are restarted through a Rad51-mediated process.

SOCIAL BEHAVIOR, STRESS, ANXIETY, AND DOPAMINE: IT IS A COMPLICATED RELATIONSHIP

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Complex relationships exist between stress and dopamine circuitry in the midbrain, impacting and driving prosocial and anxiety related behaviors. The purpose of this research was to examine effects of stress on prosocial behavior in *Danio Rerio* (D. rerio, Zebrafish). Zebrafish are a vertebrate model system that has been used to study the neurobiological and genetic basis of complex behaviors due to a high degree of genetic conservation and similarities to human neural circuitry. Environmental (ostracism) and pharmaceutical (220 µM 1 Methyl-4 Phenyl, 1,3,3,6-tetrahydropyridine, MPTP) treatments were used to manipulate neurological dopamine pathways involved in the stress responses. Treatment was expected to decrease prosocial behavior, such as shoaling, while increasing anxiety behaviors, such as thigmotaxsis. Treatments across sixty adult zebrafish, were administered to three groups (n=20); Ostracized (T1), MPTP (T2), and ostracized and treated with MPTP (T3). One treated fish from each condition

was observed and recorded for two minutes with four untreated fish. Videos were recorded and analyzed using Virtual Dub and Image J running the manual tracking plugin (NIH). The manual tracking plugin was used to measure velocity (cm/s), distance traveled (cm), nearest neighbor (distance in cm to nearest control fish), and thigmotaxsis (time spent in peripheral regions of tank in seconds). Microsoft excel and SPSS was used for statistical analysis. Analysis of velocity and distance showed that neither ostracism nor MPTP treatment had negative impacts on motor function. Nearest neighbor analysis showed deviations from shoaling norms in all treatment conditions ($p<.04$). Contradictory to our hypothesis, all treatment groups preferred to swim in open areas of the tank. However, when examined individually, T2 subjects spent more time in peripheral areas of the tank ($p<.02$), indicating higher anxiety. Collectively, results indicated that prosocial behavior of treated fish was reduced by anxiety inducing treatments. These results further provide insight into functions of dopamine and reward circuitry and their role in social behaviors as well as coping with stress.

INVASIVE PLANTS THAT HYBRIDIZE: CHALLENGES IN CATTAIL IDENTIFICATION AND IN ESTIMATING HYBRIDIZATION RATES

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Wetlands provide important ecosystem services but invasive plant species can greatly compromise these services. There are three recognized *Typha* (cattail) species found in North America. *Typha latifolia* (broad leaf cattail) is a native species found throughout much of the US and southern Canada, *Typha angustifolia* (narrow leaf cattail) is invasive across the eastern and Midwest US, and *Typha x glauca* is a hybrid of the two species, found wherever *T. latifolia* and *T. angustifolia* co-occur. Although cattails are ubiquitous wetland species, the increase in both invasive and hybridized *Typha* results in a decrease of native plant biodiversity and altered wetland function. Due to the hybridization and overlap of parental species' traits, morphological identification of *T. x glauca* hybrids is challenging, and there are scarce data suggesting that the F1 hybrid (*T. x glauca*) may be fertile contrary to what had been speculated before. To more accurately distinguish among the three species, SSR markers (simple sequence repeats, commonly referred to as microsatellites) can be used. To use resources efficiently, we have been using SSR markers developed by other investigators from *T. latifolia*, *T. angustifolia*, and a related species, *T. minima*, but we have identified only six that are able to reliably distinguish the three cattail species from sampled plants in 32 populations from 7 Midwestern states. We need more markers that are diagnostic in

order to achieve robust molecular identifications, so our goal is to develop more SSR regions that distinguish among the North American *Typha* species. Next-generation sequencing techniques have recently become available, and can be powerful tools for developing SSR markers. DNA from a morphologically identified *T. latifolia* plant was sent to a commercial biotechnology firm (GENEWIZ, Inc.) for next-generation sequencing. With the sequenced genome, we started identifying *Typha latifolia* SSR markers by using MSATCOMMANDER computer software to search and organize the SSRs. Preliminary results indicate that we are likely to produce on the order of thousands of markers that we can then test in *Typha* samples previously collected by our group. From the use of previously developed SSRs, we found that, in comparing our two most sampled states (IL and MN) there was a significantly greater abundance of *T. x glauca* in Minnesota than in Illinois (P=0.034). Furthermore, we found that the abundance of hybrids is negatively correlated with the abundance of the native *T. latifolia*. Our preliminary data suggest that the hybrid is replacing both parental species within the Midwestern region, which could have implications in the management of *Typha* stands as well as conservation of the native parental species.

INTEGRATING GEOGRAPHIC INFORMATION SYSTEMS AND REMOTE SENSING FOR LAND CHANGE ANALYSIS IN AN URBAN AREA

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Land changes are complex and dynamic processes that involve the human and natural systems interacting over space and time to reshape the earth's surface. As a fundamental form of global environmental changes, land changes also hold wide-ranging significance for the functioning of the earth's ecosystem and the human society. However, understanding land change dynamics remains a major challenge for global environmental change and sustainability research. The primary objective of this study was to investigate the feasibility and applicability of integrating geographic information systems (GIS) and remote sensing to improving the understanding of land changes dynamics in a complex urban environment.

Atlanta, Georgia was selected as the case study site. Atlanta has been a fast-growing large metropolis in the United States over the past four decades as it emerged as the premier commercial, industrial, and transportation center of the southeast. Specifically, the following dimensions of land changes in Atlanta were examined: land use/cover mapping, land change detection, and driving factor analysis. Firstly, an image

classification approach was developed to map various land use and land cover types in the heterogeneous urban area from medium-resolution satellite imagery (i.e. Landsat Thematic Mapper). Secondly, remote sensing, GIS and landscape metrics were used in combination to characterize both the spatial characteristics and the nature of urban land changes. Thirdly, a multi-scale analysis was performed to explore the biophysical and socioeconomic driving factors of urban land use changes at different spatial aggregation levels (e.g., counties, census tracts, block groups) and across different spatial extents.

Overall, this study has demonstrated the usefulness of integrating GIS and remote sensing in land change research that allows the characterization of spatial patterns and helps reveal the underlying processes of urban land changes. The results indicated a transition of urbanization patterns in the study site with a limited outward expansion despite the dominant suburbanization process. Population density and location measures were found as important factors relating to urban land use changes. Both aggregation levels and spatial extents influenced the results of driving factor analysis. The technological integration also provided the foundation for the coupling of human and environment sciences in understanding land change as a coupled human and natural system.

THE PARADOX OF COBENEFITS: COOPERATION, IMPLEMENTATION, AND THE COSTS OF ISSUE LINKAGE

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Cobenefits of environmental protection, including support for sustainable development, local livelihoods, and biodiversity, can be a useful way to develop political momentum and support for international environmental governance initiatives, making approaches with cobenefits attractive to a wide variety of stakeholders. While such “win-win” approaches can be very popular in the agenda-setting stage of environmental policymaking, however, it comes at the cost of increased vagueness and complexity. As more interests have a stake in the issue and greater expertise is required for a successful initiative, the transaction costs of facilitating cooperation and communication in the implementation phase of an initiative increase rapidly. I illustrate this problem through a case study of the ongoing development of Reducing Emissions from Deforestation and Forest Degradation (REDD+), based on analysis of news reports, policy documents, and datasets mapping the expansion of REDD+ pilot projects, policy documents, and standards committees. This analysis demonstrates that while REDD+

brings numerous interests together under a common umbrella, strong international agreements have not been forthcoming and countries' implementation has been halting. As a result, the exponential growth in pilot projects and other REDD+ initiatives that has taken place since 2008 is likely unsustainable. I trace the progressive complexification of REDD+ since the initiative entered United Nations Framework Convention on Climate Change negotiations in 2005, arguing, first, that the cobenefits discourse was overly optimistic, and, second, that the cobenefits themselves compromised organizations' ability to implement policy. I provide an example of the difficulties of implementation using the case of Central Kalimantan, a REDD+ pilot province in Indonesia, based on interview and survey work conducted in the province from January to May 2012, supplemented by analysis of news reports since that time. I conclude the analysis by considering the implications of the case of REDD+ for other purported win-win international environmental governance approaches. I suggest that, rather than shunning the political benefits of win-win approaches, greater care must be taken to identify and minimize transaction costs that can limit participation in and inclusiveness of such initiatives. In other words, creating an inclusive network of groups engaged in the international environmental governance initiative must itself be a prominent part of the agenda-setting process.

PEAK FORCE QUANTITATIVE NANOMECHANICAL PROPERTY MAPPING: A USER-FRIENDLY APPROACH TO ATOMIC FORCE MICROSCOPY

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Atomic force microscopy (AFM) uses a pyramidal tip attached to a cantilever to probe the force response of a surface. The deflections of the tip can be measured to ~ 10 pN by a laser and sectored detector, which can be converted to image topography. Amplitude modulation or "tapping mode" AFM involves the probe making intermittent contact with the surface while oscillating at its resonant frequency to produce an image. Used in conjunction with a fluid cell, tapping-mode AFM enables the imaging of biological macromolecules such as proteins in physiologically relevant conditions. Tapping-mode AFM requires manual tuning of the probe and frequent adjustments of a multitude of scanning parameters which can be challenging for inexperienced users. To obtain high-quality images, these adjustments are the most time consuming. PeakForce Quantitative Nanomechanical Property Mapping (PF-QNM) produces an image by measuring a force response curve for every point of contact with the sample. With ScanAsyst software, PF-QNM can be automated. ScanAsyst adjusts the set-point,

drive frequency, scan rate, gains, and other important scanning parameters automatically for a given sample. Not only does this process protect both fragile probes and samples, it significantly reduces the time required to obtain high resolution images. PF-QNM is compatible for AFM imaging in fluid; therefore, it has extensive application for imaging biologically relevant materials. The application of PF-QNM to obtain images of bacterial red-light photoreceptors, RpBphP3 from photosynthetic *R. Palustris* as well as SaBphP2 from non-photosynthetic *S. Aurantiaca* in their respective light-adapted states will be described. Using this mode of AFM, individual protein dimers have been observed on a mica surface in the presence of an imaging buffer. These images will be compared to computational models that have been derived from X-ray crystallographic data of similar photoreceptor proteins. Currently, the research group is beginning to apply PF-QNM to investigate live cells of *S. Aurantiaca*. In specific light conditions, these cells have been shown to communicate with each other, eventually leading to the formation of fruiting bodies. With PF-QNM, the group plans to investigate the initial stages of these phenomena by observing how the structure and mechanical properties of the cells change upon exposure to light

APPLICATION OF NMR IN CHARACTERIZATION OF ARSENOPLATINS – INORGANIC ANTICANCER AGENTS BASED ON THE COMBINATION OF PLATINUM AND ARSENIC DRUGS

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Nuclear magnetic resonance is a powerful method for revealing the structure of organic compounds. A NEIU student will encounter NMR spectroscopy taking the second sequence of organic chemistry, but will not learn about the application of NMR in characterization of inorganic compounds during an undergraduate study. Recently, the first complexes of platinum(II) with arsenous acid – arsenoplatins- have been synthesized and their anticancer activity was tested *in vitro* (D. Miodragovic and co-authors, Angew. Chemie, 2013, 52, 10749). Various 1D (^{1}H, ^{13}C, ^{15}N, ^{195}Pt) and 2D NMR spectra of arsenoplatins, $[PtCl(R\text{-}CONH)_2As(OH)_2]$ (R = CH_3 or CH_3CH_2), were recorded. The single crystal structure of the derivate with thiocyanate ligand revealed that the coordination of SCN^- ion occurs *via* the coordination of the S-atom to platinum(II). The unexpected doubling of signals is observed when the SCN^-complex is dissolved in the DMSO-d_6 solution, and the 2D NMR spectroscopy (using isotopically-labeled $KS^{13}C^{15}N$ during the syntheses of the SCN-derivate) solved the mystery.

DESIGN AND SYNTHESIS OF NEW SMALL-MOLECULE ELECTRON-ACCEPTING MATERIALS FOR APPLICATION IN ORGANIC ELECTRONICS

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The development of new organic semiconducting materials for organic electronic applications has been the focus of considerable research in the past several years. Of particular applications are organic solar cells (OSCs) which offer a promising alternative for producing clean and renewable energy, due to the advantage that there is the potential to fabricate them onto large areas of lightweight flexible substrates by solution processing at a low cost. To date, the most widely investigated organic semiconductors are p-type (hole transporting) materials which are used as the donor materials in the OSCs. Compared to the p-type materials, the n-type materials used as the acceptor materials in the OSCs get less attention. For a long time, fullerene derivatives are the only choice when the acceptor materials are needed [1]. But it is well known that fullerene derivatives have several drawbacks like excessively deep lying lowest unoccupied molecular orbital (LUMO) level [2], relatively low absorbance coefficient in the visible region, and expensive fabrication technologies. So, to further advance the area of high-performance organic electronic devices, we need organic n-type materials with high absorption in the visible spectrum and controllable highest occupied molecular orbital (HOMO) and LUMO energy levels. In an effort to find lower-cost materials to replace fullerene derivatives, a series of novel small-molecule electron-acceptor materials based on anthracene as core structure was synthesized [3a-c]. By symmetrically expanding the conjugated structure of the core anthracene with different electron-withdrawing groups, we got electron acceptor materials with different energy levels and absorption region to the solar spectra. The materials have favorably located LUMO levels between -3.5 to -3.8 eV and absorb in the visible spectrum up to 700 nm-attractive properties compared to the widely used acceptors fullerene derivatives. Moreover, further studies on the photovoltaic properties of the materials are now in progress.

MASTERY AND WIKIS, TRANSITION TIME? MOVING TOWARD STUDENT CENTER LABS.

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In the last few years, we have implemented significant change in the laboratory experiments in Organic Chemistry at NEIU. Laboratory experiments changed from single session labs that were conducted in pairs to experiments that evolved over several sessions in the laboratory and were conducted in larger teams. Additionally, instead of a single authored report completed at the end of a session, the new mastery laboratory experiments required a team report that would develop over the course of several weeks. This new laboratory design created a new dynamic within the laboratory that required a higher level of collaboration, coordination, and active exchange of ideas. As will be discussed in greater detail, the traditional laboratories required students to follow careful "cookbook style" instructions and obtain predictable results. This innovative approach sought to create a laboratory experience that not only mirrored the exigencies of real scientific research, but also enabled students to take ownership of the process and collaborate with students to obtain an unpredictable outcome. Students were not provided with directions, they were instead provided with a problem which they were required to scientifically solve in teams. There was not one way to resolve it, but the application of their learnings provided the tools to come up with a variety of ways, some more successful than others, to ultimately obtain results. This iterative research process led students to obtain a deeper understanding of the material, engage more thoughtfully in the process, and correlate their book learning with real life application. The implementation of this student centered laboratory took several years and was continually updated in response to student and peer leader feedback, and my own assessment. The laboratory model had been sufficiently implemented to obtain categorical feedback on the experience, and provided an opportunity to evaluate whether this model had reached our goals. A complete new set of laboratory experiments for Organic Chemistry I and II were developed and the Chem-wiki was used for laboratory reporting in which students working in teams reflect on the process and application to real life situations. The new model was developed with the goal of enhancing student learning, promoting critical thinking, and helping students understand the experimental process in a collaborative and reflective manner. Our assessment of Mastery Laboratory in Organic Chemistry showed promising results and the potential for broader application on other disciplines.

CONCEPTUAL FRAMEWORK FOR CONTEXT DISCOVERY AND ADAPTATION

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Key Words: Qualitative theory discovery, Context Model, Isomorphism, Theory of relating, Production rule system.

Many decisions need to be in the right context in order to have a localized linear solution. This presentation is to show that there is a structural process that can help find a related model that is isomorphic to the context of the issue on hand. Once we have a context model, we can construct an adaptive production rule system in such a way that converts a static context model to become adaptive through the adjustment of the variations of inputs and/or emerging environmental factors.

The significance of this conceptual framework is that it provides a simple way to find the right context so that work does not waste on non-relevancy. Thus it will help resolve accounting errors, criminal investigation or interrogation errors, investment errors, etc. It will also enhance the preparation and implementation of a project. Moreover, it provides a framework to reconstruct a new context through emerging exceptions so that an institution becomes progressive rather than conservative.

For example, most behavior patterns of stock price movements appear like a wave. But wave as a model was difficult to apply for making a good investment decision. However, when production rules in that decision domain are used to decide the context of the price movement of a stock, the mysterious trajectory of random movement of the wave patterns becomes derivable. Comparing with other decision methods, the advantages of this contextual model become obvious: it is easy to learn, easy to use and it costs very little to implement.

The key method of this conceptual framework is in, first, finding a initial context model through open coding of a qualitative Grounded model discovery. Once vocabulary or language is discovered, an initial model can be created for refinement. Using prototyping or scenarios, the initial model can be refined to the final model that is isomorphic to the problem on hand. When the related model is final, a production rule system can be specified through the inherited relations in the model. Moreover, whenever a new environment factor emerges, the structure of model can be changed through adding and/or deleting some production rules.

In short, the presentation will provide an algorithm for coming up a production rule system for any decision space. Its advantage is that it can transform a nonlinear problem into a linear one algorithmically in such a way that work on solution space becomes just connecting, relating, and/or specifying.

GLOBAL STOCK MARKET MOVEMENTS BASED ON INVESTORS 'FEAR GAUGE'

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This paper studies the behavior of global stock markets based on the financial practitioners 'fear gauge' measure – the VIX index. Using the information in this forward looking measure of risk, I test the predictive power of this measure. The results show that to a large extent VIX does predict the stock market returns across the globe. However, the sensitivity of global stock market returns increases in more financially stressful period. This shows the important differences in the behavior of world financial markets in normal times compared to periods of financial distress. The evidence suggests that in an environment when the market foresees higher risks the Japanese, Australian, and New Zealand stock markets co-move but opposite is the case with the Asian Tiger economies where the co-movement gets lost in the high risk environment.

OPENNESS AND MACROECONOMIC VOLATILITY: DO DEVELOPMENT FACTORS DRIVE SUCH AMBIGUOUS RESULTS?

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Prior to the Global Financial Crisis of 2008, economists discussed the "Great Moderation," during which, they believed, policymakers had been able to successfully smooth cyclical fluctuations in the economy. This reduction in volatility can be very beneficial to society, allowing for stable income and consumption, as well as business investment. Yet this stability was not universal; in particular, low-income and high-income countries are likely to behave differently. And because of globalization, instability in one country might easily spill over to another.

This study examines two important ideas: Whether economic "openness" might contribute to different countries' levels of macroeconomic volatility, and whether differences result from uneven levels of development. This is done by examining quarterly data, ending in 2007, for a set of 11 countries that differ by region and by income level. Economic openness is measured two ways: By trade openness (relative amount of exports and imports) and financial openness (inflows and outflows of capital), as well as a measure of external volatility (variability in export and import prices) and a

measure of exchange-rate volatility. Each type of openness, which have been used previously by Kose *et al.* (*IMF Staff Papers*, 2003), Karras (*Journal of Economic Integration*, 2006) and Kim (*International Organization*, 2007) is expected to behave differently because they operate through different channels. In particular, financial openness has been shown to transmit volatility for low-income countries and help reduce volatility in more developed economies.

We apply Dynamic Ordinary Least Squares, a regression method that controls for nonstationarity in time-series data, to estimate our model for the determinants of output, consumption, and investment volatility. We find that trade openness has less of an impact than does financial openness, and that external risk and exchange-rate volatility also have significant effects. Consumption is shown to be affected the least by economic openness, while investment variability tends to be reduced by increasing financial openness. The effects of openness on output volatility are mixed. We then apply a nonparametric test, calculating Spearman correlation coefficients between pairs of rankings of the trade and financial openness p-values, and various development characteristics.

Fast growth in financial openness is correlated with a reduction in output volatility. Institutional quality, GDP per capita, and the level of development have correlations of opposite signs for trade and financial openness. Trade openness appears to be correlated with a reduction in output volatility for less-developed countries, while financial openness is correlated with this smoothing for those nations with higher income, more rapid integration, or a higher level of development or institutional quality. This leads us to conclude that less-developed countries should be wary of rapid financial globalization, even as they open to trade in goods and services.

THE SCIENCE OF CONSCIOUS LIVING

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Human survival now requires vigorous advancement in a new science of conscious living, which will integrate the previously, frequently contentious disciplines of biology, neurology, physics, psychology, theology and economics. A review of the literature across these fields of study brings together both timeless truths and recent research findings that independently establish the superiority of every individual human life over all collective human purposes.

Human confusion of collaborative value creation with collective ideologies has frequently brought us to the brink of extinction, only to recover upon the next wave of recommitment to more strictly life-affirming values. In biology, it's integrated attention to diet and exercise; in neurology, the passion for learning and mental growth creating new synopses throughout our longer and longer lives.

In physics, it is the quantum realities of inner and outer space, yet to be reconciled with the math of simple Cartesian planes; in psychology, the transcendent power of thought and intention to affirm, or destroy our own individual potential. In theology, it is affirmation of the wisdom of God's love expressed in the human talent given to each of us through the ages; and in economics, it is the realization that living life with an unconstrained vision of human ability to drive life's purpose can no longer be considered a viable life-affirming option, as initially offered 20+ years ago in Thomas Sowell's modern classic, A Conflict of Visions.

The results of the literature review in each subject will establish and, in some cases, recover scientific evidence that challenges us to include far more diversity and divergence into our modern view of life than current collectivist government thinking permits. More important, for this is what changes the world, our educators and educational institutions are challenged to step away from their fears and parochial interests to encourage innovation and change as these scientific findings command us to better and more responsibly serve each other.

In conclusion, the new science of conscious living affirms the findings reached by Ken Auletta in Googled (2010). As he presented here on NETT Day 2 three years ago: it is "the end of the world as we know it." That is, we are now all individually in charge of the success of the human project, and must accept and secure that from those whose mis-educated intentions would continue to exploit us.

EVALUATION OF A NEW MODEL OF RETENTION IN A COMMUTER-STUDENT POPULATION

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The investigation of student retention in commuter colleges and universities is of great importance to faculty, administrators, policymakers, students and other stakeholders who are concerned with the issues of quality, equity, learning and accountability in higher education. The current research contributes to the research knowledge base on

student retention by defining and evaluating a longitudinal model of retention for first-time-in-college students at an urban, mid-western commuter university.

The model was developed based on Bean and Metzner's (1985) Non-traditional Undergraduate Student Retention Model. It also incorporated research on student engagement in the learning process and in high-impact educational practices, which had been linked to desired college outcomes (Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008; Pascarella & Terenzini, 2005; Tinto, 1993). The model includes the following academic engagement and financial factors: pre-college academic achievement, Deep Learning, Study Time per Week, College Math Readiness, Hours of Employment, receiving (or not receiving) a Pell Grant Award and Financial Concerns. Structural equation modeling techniques were utilized to simultaneously assess the quality of the theoretical construct known as Deep Learning and to test the hypothesized causal paths linking the engagement and financial factors to college grades and student retention.

Results indicated that when controlling for precollege academic achievement, Deep Learning, Study Time per Week, and College Math Readiness had positive effects on First-year Grades. Working outside campus 21 or more hours per week negatively impacted First-year Grades. First-year Grades and Pell Grant Award positively influenced First-year Retention, but Financial Concerns were found to have a negative effect on retention. When applied to second-year students, Deep Learning and Major Selection variables were found to have significant effects on Second-year Grades. Factors that positively influenced Second-year Retention were Grades, Major Selection and Pell Grant Award, while Financial Concerns lowered the likelihood of Second-year Retention.

Based on these results I suggest that institutional efforts in engaging students in a deep learning-based curriculum, encouraging major and career exploration, and providing college-financing resources can create pathways to greater academic success and persistence among commuter students.

ENGAGING DIFFERENCE IN U.S. UNIVERSITY CLASSROOMS TO PREPARE GLOBAL CITIZENS

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As United States demographics shift and people of diverse global backgrounds frequently work together, difference (i.e., social identity categories such as race, gender, social class, etc.) becomes an increasingly central communication problematic for our ever-changing working world. Because the university classroom is an instructive institutional space of socialization for individuals as thinkers and workers, higher education instruction should place difference at its forefront to prepare students to anticipate "the complex interactions characteristic of diverse workplaces" (Deetz & Eger, 2014, p. 27). Inspired by Allen's (2011) "difference matters," in this paper, I discuss and challenge normative assumptions of difference and sameness, and I characterize the classroom as a space to help students understand historical implications of discourses of self and other in ways that "empower organizational actors to work for social change" (Allen, 2005, p. 49).

Communication scholars' growing inquiry of difference builds upon our evolving theories of voice, identity, and power (e.g., Putnam & Boys, 2006). I highlight difference as communicatively accomplished and as "both medium and outcome of collective sense-making processes of organizational members" (Mumby, 2011, p. vii). How people talk about and relationally construct difference powerfully impacts the ways that we understand social life (McClellan, Williams, & Deetz, 2011). Thus, our undergraduate courses should treat difference as more than merely "diversity" (often thought of as counting/representation of "minorities" in organizations) and move beyond teaching only one day/chapter/week of difference matters. An emphasis on difference can better situate this concept as a complex social phenomenon, including as a series of intersections (Crenshaw, 1996), dialectical tensions (Putnam, Jahn, & Baker, 2011), and the orientation from which people understand work practices (Ashcraft, 2011).

Through difference-based pedagogy students can be encouraged to think and act in ways that reflect self-awareness and social justice commitments. In this paper, I share how particular pedagogical practices can enhance how we "do" difference (West & Fenstermaker, 1995) in the university setting. Finally, this paper considers: What if, instead of placing "difference" as a topic that is taught during a given day or week in a semester, university instructors forefront difference as central element from our courses' inception through their completion? I discuss meaningful ways of doing difference pedagogy that will not only teach students critical thinking for their working lives but will also advance the social sciences by preparing future organizational participants to understand our complex global world.

RIGHT FROM THE START: TEACHER STUDENT RELATIONSHIPS AND THE TRANSITION TO HIGH SCHOOL

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Background: Teachers vary widely in their views about the role that teacher-student relationships play in their teaching. How teachers and students define their relationships and how relationships matter also varies according to teachers' priorities and students' needs during different time points throughout their educational careers. During school transitions, for example, relationships between teachers and students are often disrupted, fully severed at one school and started anew at the next. Thus, examining relationships during these transitions can highlight important ways to help students become engaged and successful in their new school environments. This study examines the development of teacher-student relationships during one critical school transition – the transition to high school. In the Chicago Public Schools (CPS), research on this transition has identified it as a key turning point for students' chances of graduating high school. At the end of the 2011-12 academic year nearly a quarter of CPS ninth graders failed to have the requisite course credits to be on-track to graduate high school (Allensworth, 2005). Meanwhile, on district-wide surveys, a key dimension of relationships – teacher-student trust – had also been reported by ninth grade students as the most significant variable associated with higher ninth grade attendance, lower course failure rates, and better course grades (Allensworth & Easton, 2007).

Research Question and Objectives: This study asked: How do ninth grade teacher-student relationships develop? It sought to understand two points of analysis largely ignored by research on this transition to date: 1) which influences were particularly important in shaping how ninth grade teacher-student relationships develop and 2) how do these relationships impact ninth grade students' classroom behaviors, engagement, and performance.

Methods: Using a grounded theory method, and drawing on classroom observations and in-depth interviews conducted with eight ninth grade teachers and sixteen ninth grade students in one Chicago neighborhood public high school, this study explored how ninth grade teacher-student relationships developed throughout one academic year by analyzing teacher classroom practices and student classroom behaviors, engagement, and performance.

Results: Driven by the roles, goals, and expressions of care that ninth grade teachers in this study demonstrated, right from the start of the academic year, findings highlight how distinct approaches to relationship-building are closely tied to how ninth grade students behaved, engaged, and performed in their classes.

Conclusions and Implications: Underscoring that teacher planning priorities, and the timing, sequence, and use of specific classroom-based relationship-building strategies are all critical for how teacher-student relationships develop, the implications of ninth grade teacher-student relationships for the school outcomes and life chances of students in urban public high schools are discussed.

INFUSING DISABILITY CONCEPT INTO PHYSICAL EDUCATION TEACHER EDUCATION PROGRAM

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Number of students with disabilities has been increased over the past 20 years (USDE, 2012), and majority of these students receive education within the general education setting. However, researches have indicated that teachers feel they have not been adequately prepared to include students with disabilities (Hardin, 2005; Haycock & Smith, 2011; Meegan & MacPhail, 2006). Current studies have shown that most Physical Education Teacher Education (PETE) programs still provide and require only one Adapted Physical Education (APE) course (Kwon & Block, 2013; Oh,et al, 2010). Since taking one APE course is not enough to prepare future General Physical Education (GPE) teachers to work with students with disabilities, researchers (De Pauw & GocKarp, 1994; Jin, Yoon & Wegis, 2013) argued that the standard PETE curriculum should be reconceptualized to better inform teachers about including students with disabilities.

Purpose of this presentation study is to describe the profile of APE course in PETE program and to see the disability concepts are infused throughout the PETE curriculum. Fifteen instructors teaching APE course (*N* = 15) completed the open-ended questionnaires. Result revealed 70% of the participants answered they have one APE course in their PETE program. 80% of participants reported their PETE programs infuse disability concepts into physical education pedagogy courses, physical activity courses, and kinesiology courses. Methods for infusing disability concepts include inviting instructors, having discussions, doing simulations, and introducing equipment, and

teaching strategies. Participants' major concerns regarding their PETE program are; (a) taking one APE course is not enough to train teacher candidates toward including students with disabilities, (b) APE practicum should be provided for hands-on experience, and (c) PETE faculty have limited knowledge regarding disabilities.

Historically teachers were exempt from teaching students with disabilities, and teacher preparation program has been inadequate in training teachers for inclusion (Welch, 1996). The field of PETE was also segregated with APE, so that PETE students had little practical experience working with students with disabilities (Hardin, 2005). However, one rationale behind the teacher education curricular reform movements presented it as a way to enhance the preparation of teachers for working effectively with a diverse group of learners (Zeichner et al., 1996). The study revealed limited training for teacher candidates including students with disabilities in PETE program and challenge of 'how' to successfully infuse the concept into courses. Since each area required their own strategy, there should not be a one-size-fits-all approach. For example, strategies in exercise physiology should be different from that of elementary pedagogy. Also, faculty training is recommended to increase their level of understanding toward including students with disabilities.

PROMOTING PRESERVICE TEACHERS' INQUIRY AND COMPUTATIONAL THINKING USING SCRATCH

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The Next Generation of Science Standards has practices (i.e., Science and Engineering Practices) that it recommends for science educators. Some of these practices include developing and using models, planning and carrying out investigations, and using math and computational thinking. Modeling and computational thinking are introduced in the new standards. Many science concepts are abstract and require mental or physical modeling to help students visualize abstract concepts (e.g., atoms, solar system, and photosynthesis). Model building is important for students because it promotes inquiry, conceptual changes, and representational literacy (Stewart et al., 2005). One type of model building is using computer programming to construct models that enhance students' computational thinking.

We are using an interdisciplinary approach to examine the best ways to engage students in computational thinking while improving their science knowledge. As faculty from the teacher education and computer science department, we have designed a mini project to improve pre-service teachers' reasoning skills and computational thinking using computer programming. Scratch (scratch.mit.edu) is an innovative programming environment that allows people to create stories, games, and animations. It is being used in K-12 classrooms and it does not require previous programming experience. In our project pre-service teachers from a science method course will take part in a basic programming laboratory session using Scratch and will be asked to build a solar system using animation, sound, loops, and variables. The students will create a solar system to show that the earth revolves around the sun counterclockwise while the moon also revolves around the earth. This can be a difficult concept for students to grasp, and the hope is that by creating these programs, students will learn more by programming and seeing the solar system in motion. The students will then be required to complete a survey about this experience. This will help us determine whether they are now more likely to use Scratch or other programming techniques when teaching their courses. The results of our project will show the extent to which the pre-service students were engaged during the Scratch programming class and feel it will be useful for their own courses. This will help in determining whether or not pre-service teachers should have more exposure to programming in their science method courses in the future.

UTTERANCE FLUENCY AND COGNITIVE FLUENCY OF ENGLISH LANGUAGE LEARNERS

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One of the most noticeable differences between speech in first language (L1) and second language (L2) is found in fluency. Kormos (2006) argues that the differences in L1 and L2 fluency can be explained by the degree of automaticity. Whereas L1 speech production requires attention only to speech planning and monitoring, in L2 speech syntactic and phonological encoding may not be fully automatized, slowing speech down. However, there is still little empirical research evidence which demonstrates in what respects L1 and L2 fluency is different. Based on the Segalowitz's (2010) L2 fluency framework, the current study tries to address these issues by investigating utterance fluency (i.e., temporal aspects of speech fluency) and cognitive fluency (i.e., underlying cognitive processes for speech fluency) in L1 and L2 speech.

Native English speakers, intermediate and advanced Korean learners of English

participated in the study. Utterance fluency was examined in terms of speed, length of run, repairs, and pause phenomena in spontaneous speech samples. In an attempt to understand the cognitive processes involved in L2 dysfluency, responses of stimulated recall were collected and analyzed. The results showed that the L1 and L2 speakers were different in speed, length of run, and silent pauses. In particular, a striking group difference in silent pause rate within a clause was found, consistent with the claim that pauses within clauses reflect processing difficulties in speech production. Different qualitative patterns in the stimulated recall responses by the lower and higher proficiency learners are discussed in relation to Ullman's (2004) declarative/procedural model and Segalowitz's (2010) fluency vulnerability points in L2 speech production.

THE IMPACT OF SERVICE LEARNING AND CRITICAL REFLECTION ON STUDENT PECEPTIONS OF BEHAVIORAL AND AFFECTIVE LEARNING: A LONGITUDINAL STUDY

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Research has demonstrated that engaging students in the learning process increases their attention and focus, motivates them to practice higher-level critical thinking skills, and promotes meaningful learning experiences (UW, 2012). For ten years I incorporated service-learning projects into my 300-level Organizational Communication course at Northeastern Illinois University. The projects were designed to provide students opportunities to use newly acquired skills and knowledge in real-world, non-academic settings. The partners in these projects were always non-profit organizations. Non-profit organizations need to communicate with their audiences; not only to relay program information, but also to raise awareness of important social issues, as well as money to address those issues. The resources for such communication, however, are often lacking. Therefore, the projects were designed to assess the needs of each organization and provide useful communication materials, training and/or event planning. The research presented here is the culmination of ten years of data collection through narrative, interviews and lived experiences. The two major goals of this study were: 1) to explore the effects of service learning and critical reflection on the behavioral and affective development of students and 2) to enhance understanding of how learning is enriched by service.

Longitudinal data were collected from 280 undergraduate students enrolled in my Organizational Communication at Northeastern Illinois University between 2002-2012.

At the completion of a service learning project, students wrote reflective essays that focused on the overall experience of working as part of a team to develop and deliver products for their client. Each student answered the following prompts: (A) what have you learned and/or achieved through the process of this project and (B) what connections can you make related to our course? Also, please describe what you think the (C) usefulness or benefits are of this type of project, as well as the challenges.

A qualitative thematic reduction method was utilized to analyze the content of student essays. Themes were derived from the narrative data to develop categories and provide a deep understanding of student perceptions of their experiences. Analysis of essays revealed four key themes about the impact of the service learning experience and critical reflection on the students: (1) critical reflection enhances learning; (2) service learning promotes an emotional/social connection; (3) real world praxis is invaluable; (4) experiential learning is the key.

The findings from this study suggest that students experience an increased awareness of the their role in community, an increased sense of personal efficacy and personal values, and increased engagement in the classroom experience. This is consistent with extant research on experiential and service learning.

THE FREQUENCY OF DETERMINER ELEMENTS IN CROW NOUN PHRASES

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In some languages, when a common noun like *cat* appears in a sentence it requires an article such as *the,* demonstrative such as *that* or other “determiner”. Determiners also include items such as numerals and other quantifying words like *some*, *all*, *each* and *every.* Many other languages, however, allow their nouns to appear “bare”, i.e. without a determiner, as in the Persian example in (1a).

(1a) gorbe muš did
cat mouse saw
‘The cat saw a mouse’
(1b) *Cat saw mouse

In (1a), the Persian nouns *gorbe* ‘cat’ and *muš* ‘mouse’ appear bare. In contrast, the translation in (1a) suggests that some sort of determiner is required in English, a fact

further supported by (1b), where the determinerless nouns rend the sentence ungrammatical.

Some linguists have interpreted these facts to mean that languages come in distinct types: languages whose nouns require determiners and languages that don't (e.g. Longobardi 1994, Chierchia 1998). In contrast, other researchers such as Gil (1987) tend toward recognizing that the requirement or absence of determiners with nouns is a more-or-less phenomenon, with French-type languages on one end of the range and articleless languages like Mandarin and Vietnamese at the other; English happens to be somewhere in between the two extreme poles, since plural nouns do not require a determiner, as in (2).

(2) Cats eat mice

In this presentation I report the results of an analysis of 500 sentences from Crow, a Siouan language with 3,000 to 4,000 speakers mostly in Montana, and show that, while determiners are not required, speakers highly prefer to use them. A majority of Crow nouns in the 500-sentence sample do appear with determiners, and in most of the cases where a determiner is absent that absence is compensated by some other element serving a determiner function. That is, while on first glance Crow may seem like a language where determiners are optional, in fact nouns, with few exceptions, require the use of determiners defined in a broad sense. Crow, then, supports the idea that the use/nonuse of determiners in languages is not a categorical phenomenon. At the same time, placing Crow within the range of crosslinguistic variation is nonetheless consistent with analyses of the noun phrase within a generative framework. In short, at a more abstract level, Crow nouns are more like French and English nouns than like Mandarin or Vietnamese nouns.

LANGUAGE CHOICE, CODESWITCHING AND LATIN@ IDENTITY

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> "I am always the other but I get to choose my identity depending on context"
> (Guillermo Gomez-Pena, 1993)

> "Our language gives us powerful and enticing sounds: A breathless '*Te deseo*' is far more provocative than a matter-of-fact 'I want you'." (Latina 2003)

Language is one of, if not the most, salient means by which we present and re-present ourselves, and through which we construct global, local and individual identities (Blommaert 2005, Bucholz and Hall 2005, De Fina 2007, Mahootian 2002, 2012). Language contact born out of immigration has played an important role in language change and in the creation of new varieties (Heine and Kuteva 2005, Mahootian 2005, 2014, Nagy 2010). As an immigrant nation, in the US the relationship between language and identity can be best characterized as a work in progress. National identity, community identity, and individual identity are often determined and separated by linguistic boundaries. In this paper, I consider the impact language contact has on the structure of language and on the construction of identity. I examine the role and function of mixed, hybrid patterns of language use, including codeswitching and codemixing (shown in the examples below), with a focus on the Latin@ population in the USA I present a range of data taken from popular mainstream publications (including the work of Luis Valdez, Mexican-American playwright; Guillermo Gómez-Peña, Mexican-American performance artist and activist; Junot Diaz, novelist and MIT professor; and from *Latina*, a women's lifestyle magazine) and discuss how language choice serves as a means of self and "other" identification in multicultural communities as well as a source of empowerment. Moreover, I propose that the key to maintaining multiple languages is through understanding of the roles and relationships of each language within and across speech communities. I suggest that an approach which recognizes language as a resource allows for a fuller articulation of the issues and outcomes of contact, and provides a framework for a comprehensive analysis of the social and political significance of mixed.

Examples from *Latina*:

(1) Also, *el amor* is about giving *nuestros niños* the best opportunity…
love our children

(2) I could not agree more that Emilio (November) is in fact *el papi mas chulo*
the finest man

HOW THE SHAH'S IMPERIAL ARMY FAILED TO PROTECT THE PAHLAVI DYNASTY IN 1979

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The Shah put the Iranian military on high alert during the Islamic Revolution in 1978-79. Its high-ranking officers who were in charge of different branches of the Imperial Armed Forces performed their duties under direct orders of the Shah. Thus, from the beginning of the first wave of protests in summer of 1978, the military encountered the protestors in various ways that included declaring Martial law. However, when Shapour Bakhtiar was appointed to the office of prime minister by the Shah who shortly after left the country in January 1979, the military malfunctioned and was unable to continue to perform its duty effectively. As a result, the protestors gained more ground and Bakhtiar's government collapsed after 37 days when General Abbas Qarabaghi, the Commander of the Joint Chiefs of Staff announced the neutrality of the armed forces in the Revolution.

In this paper, I argue how the military establishment failed in its objective to keep the Pahlavi dynasty intact due to its lack of confidence in its own leadership that was mainly the consequence of the shah's egocentric management of the military leaders' training. Additionally, I argue that because Bakhtiar was not yet settled into his position as the new prime minister in the heat of those chaotic days in January 1979, the military refused to take heed of his orders, and that is why he could not continue his work as Iran's newly appointed prime minister.

This paper is based on two sets of primary sources. The first group is a collection of videotaped interviews that are now archived in the Iranian National Library. These interviews were recorded in 2009-10 in Europe and North America. Over 500 hours in total, I have examined over 100 relevant hours of these interviews. They include interviews with Lieutenant General Abdullah "Shapur" Azarbarzin, the commander of Iranian Royal Air Force, General Khalil Shojaee, the director of Iranian military counterintelligence, Rear Admiral Amir Houshang Aryanpour, the deputy commander of the Iranian navy, Amir Aslan Afshar, the Shah's chief of staff in exile, and the Iranian ambassador to the United States Ardeshir Zahedi, amongst others. The second group is a collection of transcripts of confessions and court proceedings of ex-military leaders of Iran after the Revolution had succeeded and once the provisional government put them on the infamous kangaroo trials led by Sadeq Khalkhali.

HOW INTERNATIONAL LEADERS OVERCOME DIFFICULT SOCIAL CONDITIONS AND MOVE BEYOND THEIR LOCALITY: AN EXPLORATORY STUDY OF BIOGRAPHY AND LEADERSHIP DEVELOPMENT

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Literature has it that victims of social and political oppression are more likely to resort to bitterness, hopelessness, violence and vengeance in the form of war, bloody revolution, and other retaliatory behaviors. Furthermore, some scholars, thinkers, and important historical documents have promoted violence as the only way out of oppression. Most leaders of social and political revolutions that turned violent or became bloody wars are reported to have been themselves victims of oppression. However, history has also known victims of various forms of oppressions, including most Nobel Peace Prize laureates, who have risen above their conditions of the oppressed to become artisans and leaders of peaceful change on global scale. While some studies have been conducted on the peculiarity of some leaders that responded to oppression by leading peaceful, religious, political and social movements, literature has a gap with regards to Nobel Peace Prize laureates who after being victimized under political or social systems, have become heralds and leaders of peaceful change in the world. To my knowledge, literature has not studied synoptically the lived experience of those exceptional humans, to figure out the rationale behind their common response to violence by peace, forgiveness, gentleness, and reconciliation. Specifically, literature has not examined the biographical portraits of such leaders to explain those individuals' perceptions of their own pacific attitude toward their oppressors.

ON THE SADNESS OF ANTONIO AND THE HATRED OF SHYLOCK: SHAKESPEARE SHOWING US WHY THINGS HAPPEN

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> In sooth, I know not why I am so sad/… whereof it is born, /I am to learn;
> And such a want-wit sadness makes of me,/That I have much ado to know myself. *The Merchant of Venice* (I, I, 1-7)

If, in a play's first line, the title character tells the audience he is despondent and that this despondency impairs his judgment and ability to understand himself, the audience will understand this despondency to be the driving force of the play. A careful reading of the text and comparison with its sources will lead us to conclude that the interplay between individuals like Antonio and Shylock and the nature of English society would prevent a self-assertive Jew from practicing a legitimate profession. (Immediately, Shakespeare hints that the characters are present-day Englishmen). In the end, Antonio will say enough about his despondency to enable psychiatrists to advance a diagnosis.

Antonio's friends insist he is despondent because his merchandise is at sea. Antonio responds he is not worried about his merchandise because not all his fortune is at sea. He was born sad.

When Bassanio seeks a loan to court the wealthy Portia, Antonio replies all his fortune is at sea (thus Antonio is a dissembler and a high-stakes gambler): they must get credit. They approach Shylock whom Antonio often harasses criminally. Shylock tells us he hates Antonio because he is a Christian and especially because of this harassment. (Surprise! The oppressed hate their oppressors!) Antonio harasses Shylock because he charges interest and threatens to continue this harassment unless Shylock stops charging interest. Antonio, with his impaired judgment, is unconcerned whether Shylock can afford never to charge interest. Finally, for the sake of an interest-free loan of a modest sum, Antonio enthusiastically contracts to remit a pound of his flesh should he default, knowing instinctively that no court would uphold the contract. (Shakespeare's father was a moneylender).

Bassanio marries Portia, a hypocritical xenophobe. Shylock first treats the contract as a joke but Jessica's elopement (which Antonio assisted) and her breaking all family bonds enrage him and Shylock resolves to collect if Antonio defaults, for personal revenge and to stop the persecution of the Jews.

Portia, disguised as a law-expert, by asking at trial "which is the Jew?" announces what is Shylock's legal status. He refuses money. Portia rules that, because he is an alien who has sought to kill a Venetian, he can forfeit his wealth and be executed. The Duke waives execution and leaves Shylock half his wealth while Antonio asks that Shylock be forced to become a Christian. Shylock accepts, thus becoming a Christian interest-charging moneylender. Antonio and Anti-Semitism, exposed, triumph. In most of the above, Shakespeare was an innovator.

TEAM-TEACHING AS A MODE OF TEXTUAL PRODUCTION: TEACHING *AS* WRITING, WRITING *IN* TEACHING

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In what ways does the teaching of a creative writing course generate literal and subliminal material for one's own "creative" work? How might writers *use* their courses as a writing and thinking space? How does team-teaching become collaboration at its most metatextual and intimate level? How might a presentation of this line of inquiry look?

We propose that the often bemoaned "juggling act" of teaching-and-writing concurrently be *re-situated* as an opportunity for textual production. In particular, we are interested in what tangible and intangible—sometimes nearly *alchemical*—shifts take place when writers of distinct genres (Prose, Poetry) co-teach, as we have, in two NEIU Summer Creative Writing Institutes that met on a labor-intensive schedule, all day, every day, for two weeks. We are writers who teach. We are writers who co-teach a course about writing. When we "write" a course, we are acting as writers; when we teach, we are "writing" at subtextual and metatextual levels. When we collaborate, we "teach" ourselves and one another.

In the classroom and sometimes beyond, we are genre-bending. We are pedagogically and artistically devoted to both chance and craft, to course conversation as an act of writing. We merge the pedagogical and the artistic. We seek*, at least in some moments of textual production and instructor self-inquiry*, to end quarantines of genre, teaching, writing, reading, authoritative texts, student texts, classroom voice, authorial voice, and all other implicit and explicit "controls" on textual production and thinking.

This line of inquiry must necessarily be presented as a hybrid-form recitation and exposing of texts: what we produced alongside our students and one another, what we produced in order to generate our own space of inquiry, what we produced as an act of radical transgression of textual boundaries. We will publicly read our work (in its various modes) to *reveal*.

In other words, this presentation is a literary reading of hybrid work (creative, critical, something "else") in a collaborative format (we will both read—in a kind of collage form—sometimes directly narrating and explaining the work, sometimes letting the creative material speak for itself).

We seek to have our presentation aligned with other critical approaches in English Department classrooms (as opposed to: aligned with other creative works, which, presumably, do not also posit a pedagogical position).

INTERPRETING AMBIVALENCE: UNDERSTANDING STUDENT IDENTITY CONFLICTS THROUGH STORIES OF LITERACY

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This project is part of a multi-year project that imagines new ways of teaching students who may feel as if their home identities conflict with their school identities. It is relevant for NEIU as we consider better ways of retaining students and for educators nationally, who need to understand the difficulties non-traditional students can face in school. My contention is that a good way for students to learn about the complex political and personal conflicts that sometimes result from education is through literacy narratives: stories of reading, writing, and education that reflect the way language education challenges our sense of self. I use theories of subjectivity, language, and identity from critical pedagogy to analyze professionally written literacy narratives and student narratives in order to show the subtle ways conflicts of identity can emerge in student reading and writing.

Students in my English 101 classes read Richard Rodriguez and others who suggest that students of color, second language speakers, and others must choose between their home lives and their academic lives. We also read writers such as Gloria Anzaldua and Megan Foss who describe their need to bring their lived knowledges and languages from their home communities into the university—and the ways reading and writing help them do that. We read about people immersed in reading and writing—from Frederick Douglass to Jay Z—and how their relationship with language shapes and challenges their identities.

In this presentation, I briefly analyze a section of Megan Foss's "Love Letters" and a student paper in response to Foss's work. Foss's story helps faculty and students alike understand more clearly some of the ambivalence that can come into play when non-traditional students enter the university. As Foss describes in this piece of creative non-fiction, writing helped her leave a life of poverty and addiction and helped her construct new identities as a student and English teacher. However, while "Love Letters" reveals how home languages and knowledges can be useful in developing a critical consciousness, it also reflects some of the extreme difficulties that can result when integrating home and school cultures. Exploring these difficulties can give concrete meaning to some of the ambivalence many students feel about education **and** offer possibilities for dealing with that ambivalence.

DIS-ALIENATING THE NEIGHBORHOOD: MISTER ROGERS' MARXIST VISION OF LOVE AND WORK

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The vision and understanding Mister Rogers presents of work and labor, I suggest, really center the show's principal ideals of community and neighborhood in cultivating in children a consciousness of the world as process, not as finished product, and an understanding that their relationship with objects really constitute relationships with the people around them, both near and far. Mr. Rogers repeatedly highlights how the crayons we use, the marbles we play with, the sweaters we wear, the food we eat, the electricity we call on to light our homes, the mail that shows up on our door post, have an origin in human labor; and his show traces these origins by revealing to us the processes of production in the crayon or marble factory or the work the utility operator does on the power lines while also introducing us to the actual people who perform this work and make our lives possible, such as the mainstay character of the mail carrier Mr. McFeely. In orienting the child's consciousness to comprehend the world as always in the process of production and not as a static finished objective entity, Mister Rogers simultaneously cultivates in children a sense of empowerment in their ability to take part in producing and shaping our world through their creative actions, whether we call them work or play. In their form and content the episodes of *Mister Rogers' Neighborhood* ask us to undertake, indeed themselves orchestrate, a renegotiation of our relationship with objects such that we become intensely aware of (1) the way our interactions with objects actually situate us in a complex web of relationships with people, (2) the way the work people do for us is essential for making our lives possible, and (3) the way we impact or can potentially impact the world through our work, especially that work we do not even typically recognize as such. With great sophistication that has the appearance of simplicity, Mister Rogers demystifies the abstractions of our complex political economy and comprehends them for us in the kernel of human relationships that they constitute, cultivating an appreciation and gratitude for the work people do, a re-thinking and re-valuing of work itself, and an affective comprehension of the work people do to meet each other's collective needs as expressions and behaviors of love in a larger social sense. As he asks us to think about the collective work we do as the most profound way we relate to one another, Mister Rogers presents a cultural vision and set of values starkly at odds with our dominant national values today, particularly the way U.S. culture tends to valorize an individualist ideology.

A GENERALIZED SPIN-STATISTICS THEOREM

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We generalize the spin-statistics theorem and show that a state obeys Fermi-Dirac statistics if and only if the state is invariant under SL(n, C). We also contrast it with the original result of Pauli as formulated in his paper entitled The Connection Between Spin and Statistics.

Key Words: spin-statistics, SL(n, C) invariance.
AMS Subject Class: 20C35, 81P99

SUBSPACE STRATEGY IN MATRIX COMPUTATION

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Numerical linear algebra and matrix computation are essential in scientific computing. Most of the application problems in sciences and engineering can involve some types of matrix computation at certain stages in the solution processes. Particularly in numerical polynomial algebra computations, matrix computation is indispensable since collection of multivariate polynomials are considered vector spaces and transformations of those polynomials are represented by matrices. To gain understanding of those polynomial transformations, we need to perform various calculations on the representation matrices such as decompositions, triangularizations, computing regressions and solving linear systems. In recent years, tremendous progress has been made in solving polynomial algebra problems by employing matrix computation methods. For instance, the numerical greatest common divisor (GCD) of polynomials are computed via computing the numerical rank and kernel of the classical Sylvester matrix. Numerical factorization of univariate and multivariate polynomials are obtained by a sequence of computation of the reducibility matrices. Computing the multiplicity structure of a solution to a nonlinear system reduces to manipulation of a Macaulay matrix sequence, and so on.

In formality, a matrix is a rectangular table of numbers. Every matrix represents a linear transformation from a vector space (domain) to a vector space (range). The number of columns of the matrix is the dimension of the domain and the number of rows is the dimension of the range. A major difficulty in multivariate polynomial algebra is the huge dimensions of the polynomial vector spaces, resulting in matrices whose sizes are

prohibitively large. A typical desktop computer can conduct usual matrix computations for matrices of a few thousand rows and columns. However, matrices in polynomial algebra can be too large to be stored in a normal desktop computer, let alone be manipulated in computation. In computing the GCD of two polynomials of 10 variables and degree 12, for example, the size of the Sylvester matrix is 92,561,040,705,432 requiring 500 terabyte of storage alone. Such huge matrices become the bottleneck of the computation.

Our strategy for overcoming the difficulty of large matrices is to search for proper subspaces of the vector spaces in the domain and range of the linear transformations. Most of polynomials appear in scientific computing are “fewnomials” that have very few terms. By identifying the subspaces those polynomials belong, the sizes of the necessary matrices can be drastically reduced if the dimensions of the subspaces are small. On proper fewnomial subspaces, for example, the aforementioned huge Sylvester matrix is reduced to 264,840.

In this talk, we elaborate the subspace strategies for computing GCD and multiplicity structure of nonlinear systems. The algorithms incorporate such strategies improve the computing efficiency substantially.

TUMOR MORPHOLOGICAL STABILITY: A MODEL BASED ON PHYSICAL PROPERTIES AND CELLULAR MICROENVIRONMENT

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It is a relatively well known fact that the ability of tumors to metastasize is preceded by the morphological instabilities such as chains, or fingers of cancerous cells that invade the host environment. Therefore, parameters that control the morphological shape of the tumor also control its invasive ability. Mathematical modeling of tumor growth is an area of continuous development and active research.

In this work we analyze the linear morphological stability of tumor spheroids using a 2D local model. The interface is being modeled as an elastic membrane which has a bending rigidity dependent on the curvature. The linear stability analysis that is being performed in this work is based on perturbing a circular tumor interface of radius (t), as follows:

$$r(t, \alpha) = R(t) + \sum \epsilon k(t) eik\alpha k$$

where α is the polar angle, and ϵ is the size of the perturbation. Using the normal variation of the energy, we develop a coefficient which represents the time variation of the shape factor.

Using this coefficient, an investigation is being performed on how various physical parameters, such as the bending rigidity, the mass gain rate, the chemotherapeutic agents and nutrient factors affect its morphological instability. It is being observed that the bending rigidity factor influences the radial growth of the tumor, as well as its overall shape morphology.

THE MATH COMPONENT OF THE EMERGE SUMMER PROGRAM: SUPPORTING INCOMING FRESHMEN IN MATH DEVELOPMENT COURSEWORK

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The main objective of this presentation is to describe the development, results, learnings, and future directions of the mathematics component of the English & Math Enrichment, Readiness & Growth Experience (EMERGE) Summer Program at Northeastern Illinois University (NEIU). The EMERGE Program offered a 3-week English session and a 3-week mathematics session for incoming freshmen. To participate in the mathematics session, students took NEIU's mathematics placement exam and placed into mathematics development coursework. The mathematics session aimed to help students strengthen their mathematical foundation, gain confidence in their mathematics abilities, and gain the skills needed to successfully place into a higher-level mathematics course during the fall semester. EMERGE mathematics students attended mini-lectures, participated in structured group activities, and completed online MyMathLab modules. Students were separated into mathematics classes based on their mathematics development course placement (Math 090, 091, or 092), they attended mathematics development classes run by instructors, and they received guidance and support from mathematics peer leaders. Results for the 2014 EMERGE Program mathematics component indicated a 73% success rate. Of those students who retook the mathematics placement exam, 58 of 79 moved up at least one level in mathematics.

In this presentation, EMERGE Program coordinators will first give a PowerPoint presentation that will summarize the development, results, learnings, and future directions of the program. Then an EMERGE panel consisting of student program participants, mathematics peer leaders, and mathematics instructors will share their perspectives of these topics by responding to the following questions: What are your perspectives of the key aspects of the program that played a critical role in supporting EMERGE students' success in mathematics? What are your perspectives of the challenges that were faced during the program developmental process, during the 3-week program, and after the program's completion, and how might these challenges be addressed in the future? What did you learn from being involved with the program and how might we draw on this knowledge to strengthen the program? What additional advice would you provide to improve the program in the future?

Symposium attendees will be encouraged to ask questions about the powerpoint presentation, to ask the panel questions, to provide their perspectives of how to better support incoming freshmen's success in mathematics, and to engage in discussions centered on the EMERGE Program.

THE EFFECTS OF REAL WORLD AND ONLINE INTERPERSONAL CONNECTEDNESS ON DEPRESSION AND SUICIDAL IDEATION AMONG YOUNG ADULTS

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The rise in the internet has led to a dramatic alteration in the way individuals, particularly young adults, interact with one another. As more and more people utilize their phones as mobile internet devices—statistics indicate a 60% rise in this usage; currently 818 million individuals access the internet on their phones regularly—questions about the changing way people connect to one another have arisen. These questions warrant considerable study as research has consistently demonstrated that interpersonal connectedness is strongly related to a variety of aspects of development and psychological functioning, including levels of anxiety and self-esteem (Lee and Robins, 1998), depression (You, Van Orden, and Connor, 2011), and suicidal thoughts and behaviors (Van Orden, Witte, Cukrowicz, Braithwaite, Selby, and Joiner, 2010). Research has also shown that, while internet usage is often correlated with feelings of loneliness and depression (Kraut et al., 1998), it is also most commonly used as a tool of communication, and can decrease feelings of loneliness and depression when used

as such (Shaw and Gant, 2002). Furthermore, lines of research are indicating that young adults are increasingly prolonging the Eriksonian "identity crisis" stage of their lives (Marcia, 2000). Thus, understanding changes in the way young adults connect to one another may be key in understanding the changes in how individual identities are formed. The aim of this research is to determine the role of internet usage in identity development, depressed mood, and suicidal ideation among a sample of young adults. Data collection for this study is currently ongoing, however a preliminary sample of 58 young adults (18-25 years old; mean age = 22.02 years) is analyzed for this project. Participants were recruited through NEIU's SONA system. Each participant was given a measure of depressed mood, suicidal thoughts, internet usage, and their current level of identity formation. Early results indicate strong correlations between loneliness, depression, and suicidal ideation. Additionally, there is a significant negative correlation between using websites as a communication tool and suicidal ideation. Preliminary analyses indicate that communicating with friends and family through the internet may be associated with decreased suicidal ideation among young adults.

EXPLORING THE ROLE OF PARENTING IN THE DEVELOPMENT OF CHILD SELF-REGULATION: EARLY ATTACHMENT AS A MODERATING VARIABLE

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Self-regulation (SR) has been identified as one of the single most important factors in understanding child developmental outcomes (Posner & Rothbart, 2000), with caregiving experiences considered especially critical (Volling, Blandon, & Kolak, 2006). Children who are able to self-regulate have better academic outcomes and demonstrate fewer behavioral and mental health problems in later childhood (Willoughby et al., 2011). Given the importance of SR, the current study sought to explore the etiology of two distinct aspects of SR, cognitive (i.e., executive functioning (EF)) and behavioral (effortful control (EC)). Specifically, focus was given the role of parenting behaviors and child attachment. While we know that early parenting matters, few studies have sought to examine unique effects of sensitivity (e.g., responsiveness, consistency) versus enrichment behaviors (i.e., cognitive stimulation, play activities). Additionally, while strongly linked to a host of developmental outcomes, little is understood about the role of attachment security in linking early sensitivity and enrichment to later EF and EC. To address these gaps, the current study examined the potentially differential pathways from parenting sensitivity and enrichment in infancy to both EF and EC in preschool.

Further, the role of attachment was considered by determining if pathways from early parenting to later SR differed for secure versus insecure children.

Using data from 1,058 participants in the NICHD Study of Early Child Care and Youth Development, a series of structural equation models were fit to examine the direct effects of maternal sensitivity and enrichment at 15 months on EF and EC in preschool, as well as potential moderation of the effects of parenting by attachment security at 15 months. EF, indexed by attention focusing and memory, was measured at 54 months using both observation and maternal report. EC, indexed by two measures of impulse control, was assessed at 54 months using maternal report. Sensitivity and enrichment were measured at 15 months using both observation and maternal report. Attachment behavior was coded when children were 15 months during a laboratory session.

Controlling for various demographic factors, effects of sensitivity and enrichment on EF and EC differed according to attachment security. That is, for securely attached children, greater exposure to enrichment behaviors predicted more advanced EF and EC skills. The opposite was true for insecure children, with sensitivity predicting more advanced EC and enrichment non-significant. Overall, insecurely attached children did not benefit from enrichment behaviors. Further, their EF skills were not linked to parenting at all. Findings suggest that focusing on improving sensitivity is critical if insecurely attached children are to benefit from enrichment activities. Examining differences in how parents engage their children in enrichment activities is worth examining. Further, insecure children may benefit from programs that teach parents sensitive and appropriate methods of enrichment.

EXPLORING COLLEGE STUDENTS' NATURE OF SCIENCE VIEWS AND THEIR EPISTEMOLOGIES RELATED TO LEARNING SCIENCE

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The nature of science (NOS) is a way of knowing, and it refers to the epistemology of science (Lederman, 1992). In general, the ways of knowing and one's perception of knowledge are called personal epistemology (Hofer, 2002). When a new concept is being learned, personal beliefs, experiences, values, and misconceptions shape the way of how one conceptualizes and constructs knowledge. Therefore, there might be a relationship between the epistemology of science and personal epistemologies because the epistemology of science, the nature of science (NOS), is a way of knowing in

learning science. On the other hand, personal epistemology is a way of knowing in general. From this analogy, it may be easy to say that the development of individuals' NOS views may influence their personal epistemologies, and in the same way, the change in individuals' personal beliefs may positively affect their NOS views and concept attainment.

This study explores college students' nature of science views (NOS) along with their epistemologies about science, knowledge, and motivational orientations in learning science. I hypothesize that college students' views of nature of science are crucial to learning science. Likewise, their beliefs about science, knowledge, and motivational orientations have a strong influence on attainment of informed views of nature of science. In this study, I will investigate how participants' NOS views are correlated with their personal epistemologies about science, knowledge, and motivational orientations in learning science. The results of the study will aid curriculum developers and educators in developing science courses that emphasize NOS views to improve college students' attainment of the concepts, participation in class discussions, and achievement levels in learning science.

IMPLEMENTING CONCEPTUAL THEORIES OF MOTOR SKILL LEARNING TO THE INSTRUCTION AND ASSESSMENT PROCEDURES UTILIZED IN ACADEMIC CORE SUBJECTS

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Research in the field of motor skill learning has demonstrated some significant findings related to the performance and learning of motor skills. Skills, such as, soccer kicking, dance sequences, and strategic gameplay movement involve a significant amount of cognitive processing prior to the movement execution. This extensive processing requirement and associated movement production are often very complex and provide a great insight into how instructional manipulations influence performance and learning.
Very few teachers of core content review the literature on motor skill learning and thus implementation of these findings to the teaching of subjects such as math and science is often limited.

This presentation will provide a brief overview of motor skill learning research findings and explain how these concepts can be readily applied to the teaching and assessment procedures in core subjects to facilitate student learning.

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