

Feb 22nd, 12:00 AM - Feb 26th, 12:00 AM

9th Annual Research Week - Event Proceedings

Office of Research Development

Follow this and additional works at: <https://athenaeum.uiw.edu/researchweek>

Research Development, Office of, "9th Annual Research Week - Event Proceedings" (2016). *Research Week Archived Proceedings*. 1.
<https://athenaeum.uiw.edu/researchweek/proceedings/2016/1>

This Event is brought to you for free and open access by The Athenaeum. It has been accepted for inclusion in Research Week Archived Proceedings by an authorized administrator of The Athenaeum. For more information, please contact athenaeum@uiwtx.edu.

Ninth Annual
Research Week

February 22 – February 26, 2016

Event Proceedings



University of the Incarnate Word
4301 Broadway San Antonio TX 78209



Dear Colleagues,

Welcome to the Ninth Annual Research Week at the University of the Incarnate Word. We are proud to continue the tradition of celebrating the accomplishments of our diverse community and shining a spotlight on the innovative projects that make our campus such an exciting place to work, learn, and grow.

The University of the Incarnate Word is known as an inclusive institution with a passion for teaching and learning. An important part of our dedication to excellence in educating the whole person is the effective integration of scholarship with learning. The Ninth Annual Research Week provides a wide ranging showcase of the many forms this integration takes in various disciplines throughout campus. This week you will encounter original research from every walk of life on our campus community - junior and senior faculty, staff and administrators, undergraduate and graduate students - all working together to live the Mission of UIW. As Cardinals, we know that the search for truth through research, scholarship, and creative works is a vocation that is available to all, and we are excited to share our insights and talents with the broader community.

The Office of Research and Graduate Studies and the Office of Research Development have collaborated with many individuals on campus to bring you this week's events. We would like to thank especially the members of the Faculty Research Awards Committee, the Graduate Support Center, the Office of Instructional Technology, and our talented graduate student assistants for their efforts and contributions. Most of all, we thank the presenters and attendees, and wish you the best with your future research and creative endeavors.

Sincerely,

Osman Ozturgut

Osman Ozturgut, Ph.D.
Dean
Office of Research and Graduate Studies

Table of Contents

Welcome i
Table of Contents iii
Event Schedule x
Podium Presentation Schedule xi
Performing Arts Abstracts 1
Podium Presentation Abstracts 6
Poster Abstracts 20
Visual Arts Abstracts 85

Performing Arts Abstracts

The Twelve Poems of Emily Dickinson by Aaron Copland 3
Eylon, Gokelman

Two pieces, Twelve years: A Reflection on Creative Development 4
Metz, McCain

Birding (super flumina) Babylonis 5
Salfen, Novak, & Gokelman

Podium Presentation Abstracts

College of Humanities, Arts and Social Sciences8

Power Struggle: the Real Appeal of the Bennet Sisters 8
Almirudis

**Epic Catholicism: The 28th International Eucharistic Congress and the Coming of Age
of an American Religion 9**
Ambrose

**Developing Definitions of Music Education in the High School Ensemble with the
Application of Innovative Teaching Methods 10**
Flores, Eylon

Dreeben School of Education.....11

**International Doctoral Students Research Learning Experience in a Ph.D. Program at
the University of the Incarnate Word (work in progress) 11**
Skukauskaite, Durden, Sohrabie

Co-Constructing meaning through qualitative interviewing: Researcher and participant dialogic learning	12
<i>Skukauskaite, Gonzales, Fernandez-Villanueva, Calpito</i>	
Feik School of Pharmacy.....	13
Synthesis of Novel Fluoroquinolones with Staphylococcal activity	13
<i>Garza, Yendapally, Franklin, Smith, Oliveira, Jarrett</i>	
H-E-B School of Business and Administration	14
Today & Tomorrow: Attitudes and Expectations Moving Beyond the Patient Protection and Affordable Care Act (PPACA)	14
<i>Hancock, Craven</i>	
World Bank Tax Advice to Latin America: Does it Foster Inclusive Development?	15
<i>McGuire</i>	
Social and Economic Factors that Significantly Impact the Educational Attainment of Students in Rural China	16
<i>Zhang, Soukup</i>	
Ila Faye Miller School of Nursing and Health Professions.....	17
Mentors Offering Maternal Support (M-O-M-Stm): Findings from a Randomized Control Trial of Program Effectiveness	17
<i>Weis, Lederman, Walker, Valentin, Chan</i>	
Rosenberg School of Optometry.....	18
A New Way to Tackle Diabetic Macular Edema	18
<i>Kasraie</i>	
School of Math, Science and Engineering.....	19
Study of the use of Vernier tools to Advance Concept Visualization in a Classroom Environment	19
<i>Caglayan, Whittemore</i>	

Poster Abstracts

College of Humanities, Arts and Social Sciences20

Student Evaluations Effect on Professors' Occupational Commitment, Intention to Quit, Confidence, and Affect	22
<i>Boswell, De Luna, King,</i>	
Visual Rhetoric in the Courtroom Sketches of Guantanamo's Military Tribunals	23
<i>Harding</i>	
Instagram and Romantic Relationships	24
<i>King, Boswell</i>	
Changes in Undergraduates' Just World Beliefs	25
<i>Lockhart</i>	
Undergraduates' Attitudes Toward and Perceptions of Research	26
<i>Lockhart</i>	
Infant Approach/Avoidance Motivation to Friendly and Unfriendly Characters: A Pilot Study of EEG Asymmetries	27
<i>Partridge, Pauli</i>	
Use and Application of the Course Characteristics Survey in a Research Methods Course	28
<i>Walker</i>	

Dreeben School of Education.....29

Using a Workshop as an Intervention to Determine the Effect on Improving Teacher Certification Rates: Randomized Multi-Phase Study	29
<i>Fike, Fike, Martinez</i>	
Utilizing Voice Thread for Research, Collaboration and Reflection: A Case Study of a Graduate Online Classroom	30
<i>Guzman Foster</i>	
What Can Jesus Teach Us About Student Engagement?	31
<i>James, Martinez, Herbers</i>	
Doctoral students' perspectives on learning research in the Ph.D. program	32
<i>Skukauskaitė, Calpito, Campos, Durden, Gonzales, Noske, Perryman, Sohrabie, Young</i>	
PhD Students' Experiences Learning to Research in Qualitative Research Design (INDR 8357)- Fall 2015	33

Feik School of Pharmacy.....	34
Polymorphisms Associated with the Risk of Neonatal PNAC	34
<i>Bellanger, Smith</i>	
Comparison of performance to two pharmacy resident cohorts' on an objective structured clinical examination	35
<i>Cauthon, Urteaga, Attridge, Witte</i>	
cFos changes in the hindbrain following central microinjection of nociceptin/orphanin FQ in conscious hypertensive rats	36
<i>Connor, Drzymala, Koshy, Fortepiani, Franklin, Gottlieb</i>	
Effect of Glucose, Sodium Chloride, and Ascorbic Acid Concentrations on Glycation and Aggregation of Bovine Serum Albumin	37
<i>Huang, Franklin, Coker</i>	
Arylated hydrozones, quick synthesis plus partial characterization: Elaborating small libraries of potential plural-factorial drug molecules	38
<i>Khan, Horton, Torok, Silkazwe</i>	
Comparison of Intrinsic and Extrinsic Fluorescence in Predicting the Effect of pH and Excipients on Real-Time Stability of BSA	39
<i>Powell, Manrique, Brock, Franklin, Coker</i>	
Assessment of pharmacy student performance on an objective structured clinical examination and an annual assessment exam	40
<i>Urteaga, Attridge, Cauthon, Witte</i>	
Using Multiple Logistic Regression to Model the Probability of Passing the NAPLEX	41
<i>Zertuche, Renato, Maize</i>	
H-E-B School of Business and Administration	42
Factors that Affect Tablet PC Adoption Among College Students (Research Proposal)	42
<i>Dotter, Vess</i>	
Combating Discrimination or Playing the Game: Factors Affecting Hiring Decisions for a Diverse Workforce	43
<i>Harrison, Harrison, Vogel, Brown</i>	
Results of the 2015 Society of Information Management IT Trend Study	44
<i>Vess, Kappelman, McLean, Torres</i>	

Transfer Pricing Comparison of Oil and Gas Companies to Pharmaceuticals	45
<i>Poe</i>	
Quantitative Study of Predictors of Project Management Success	46
<i>Pugh</i>	
EXPERNOMICS vs. LECTURE: A META Analysis from Journal of Economic Education (1969-2015)	47
<i>Zanca</i>	
Ila Faye Miller School of Nursing and Health Professions.....	48
Fall Stratification Program: Determining Barriers to Success of the Program	48
<i>Alonzo, Banu, Stone, Gunter</i>	
Benefits of Collaborative Testing with First Semester Nursing Students in a BSN Program	49
<i>Gillespie, Waltz</i>	
Building Cultural Sensitivity and Interprofessional Collaboration Through a Study Abroad Experience	50
<i>Gilliland, Attridge, Attridge, McNeill, Maize</i>	
Purposeful Hourly Rounding to improve patients' satisfaction scores	51
<i>Jun, Zambrano, Gunter</i>	
The Skin Integrity Project: Improving Prevention Practices for Pressure Ulcers	52
<i>Martinez, Ferniz, Gunter</i>	
Quality of Life Distinctions Between CABG and PCI Patients in a Cardiac Rehab Setting	53
<i>Mollenkopf, Saenz,</i>	
Health Concerns of Mexican American Adolescents from a Bordertown High School in Arizona	54
<i>Rodriguez</i>	
Programmatic Indicators for Board of Certification Success in CAATE Accredited Undergraduate Athletic Training Education Programs	55
<i>Soles</i>	
Identification of Medication Administration Errors: A Direct Observation of Nursing Practice	56
<i>Tharpe, Caruso</i>	

Rosenberg School of Optometry.....	57
Dopamine Agonists and Angiogenesis Induced by Vascular Endothelial Growth Factor	57
<i>Ali, Gregory, Gerilechaogetu, Renteria, Alcorn Fortepiani</i>	
Alteration in anterior chamber depth and volume following postural change from upright to right and left lateral	58
<i>Golas, Caceres, Majcher, Trevino, Ly, Lopez, Sponsel, Lehr, Smiley</i>	
Optical and Neural Factors in Perception of the “Dress”	59
<i>Houser, Talbert, Patel, Rabin</i>	
Persistence of intraocular pressure elevation following postural change from upright to right and left lateral	60
<i>Majcher, Trevino, Golas, Caceres, Ly, Lopez, Sponsel, Lehr</i>	
Impact of Hands-Free Phone Communication on Color and Luminance VEPs	61
<i>Patel, Houser, Talbert, Rabin</i>	
Neutral Compensation for Color Deficiency: Binocular Enhancement of Cone-Specific Color Visual Evoked Potentials (VEPs)	62
<i>Rabin, Kryder, Lam</i>	
Ubiquitin Carboxyl-Terminal Esterase L1 (UCHL1) Regulates Stem-Like Cancer Cell Populations in Pediatric High-Grade Glioma	63
<i>Sanchez-Diaz, Chang, Dao, Chen, Hung</i>	
Flipped classroom and its association with student performance	64
<i>Sanchez-Diaz, Fike, Hall</i>	
Development of Normative Values for a Novel Test of Dark Adaptation	65
<i>Talbert, Houser, Patel, Rabin</i>	
Understanding the Factors Influencing Students’ Decision to Practice Low Vision	66
<i>Valdes, Schmiedecke</i>	
The effects of sex hormone levels and menstrual cycle phase on intraocular pressure and central corneal thickness	67
<i>Wagoner, McCraw, Foutch, Fortepiani</i>	

School of Math, Science and Engineering.....68

Expression and Characterization of Functional Domains of Community-Acquired Respiratory Distress Syndrome Toxin (CARDS toxin) 68

Azuaje, Kannan

Quantification by ELISA of the Levels of DNA Topoisomerases I, II α , and II β in the Nuclei of HuT 78 Cells Treated with Interleukin-2 69

Foglesong, Nair, Gupta

Biological Activity in the San Antonio River 70

Hernandez Gonzalez, Mulvey

Analysis of beta catenin gene expression and identification of beta catenin full coding sequence in the regenerating annelid *Lumbriculus variegatus* 71

Hernandez, Miranda, Acosta

Weight Bearing Capacity of a Lightweight Bridge 72

Heye, Sanmiguel, Ande

miniGEMS - UIW Engineering Summer Camp for Middle School Girls 73

Nair, Frye

Comparative Respiratory systems in terrestrial arthropods: a laboratory exercise in animal physiology 74

Tallarovic, Brightwell, Schlagal

The Thermic Effect on Food in Scorpions: A Laboratory Exercise in Animal Physiology 75

Tallarovic, Brightwell, Schlagal

Rain Activated - Automobile Window Circuit 76

Wallandi Trekpah, Melendez, Ande

Air pollution and visual function – Preliminary report 77

Wetz, Aitsebaomo, Garcia

Solar in the city: Applying Chinese solar technology on the UIW campus 78

Whittemore

School of Media and Design79

Costuming Hitchcock 79

Anderson Perez

Fashion Students discover their heritage in garments designed with Mexican Textiles 80

Lopez

School of Physical Therapy81

Levels of Student Empathy, Grit, & Burnout in an Entry-Level, Problem- Based Learning Doctor of Physical Therapy Program 81

Kish, Dugan, Luna, Brown

The Effects of Creatine on the Well Being of an Aging Population: A Systematic Review 82

Stares, Bains

EMG Activity of Abdominal Muscles in the Pilates “Hundred” Exercise 83

Wagner

Breastfeeding Position Related Musculoskeletal Pain: A Pilot Study 84

Wagner

Visual Arts Abstracts

Scenic Model for The House of Bernarda Alba 87

McCollum

Event Schedule

Tuesday, February 23, 2016

Podium Presentations

Library Auditorium

12:00pm- 2:35pm

Tuesday Night Live: Fine and Performing Arts

Ingrid Seddon Recital Hall

5:15pm- 8:00 pm

Wednesday, February 24, 2016

Formal Poster Presentations

McCombs Center Rosenberg Sky Room

3:00pm-5:30pm

Graduate and Professional Student Session

McCombs Center Rosenberg Sky Room

5:30pm- 7:00pm

Thursday, February 25, 2016

Podium Presentations

Library Auditorium

12:00pm- 3:00pm

UIW Theater Arts Presents: Garcia Federico Lorca's *The House of Bernarda Alba*

Coates Theatre

7:00pm

Podium Presentation Schedule

Tuesday, February 23, 2016

12:00 PM	Welcome Osman Ozturgut, Ph.D., Dean, Office of Research and Graduate Studies
12:10 PM	World Bank Tax Advice to Latin America: Does it Foster Inclusive Development? Michael J, McGuire, Ph.D.
12:35 PM	International Doctoral Students Research Learning Experience in a Ph.D. Program at University of the Incarnate Word Audra Skukauskaite, Ph.D., Sandra Durden, & Sadeeq Sohrabie, MBA
1:00 PM	Power Struggle: The Real Appeal of the Bennet Sisters Olivia Almirudis
1:25 PM	Developing Definitions of Music Education in the High School Ensemble with the Application of Innovative Teaching Methods Joseph D. Flores & Elyon A. Orit, DMA
1:50 PM	Study of the use of Vernier tools to Advance Concept Visualization in a Classroom Environment Okan Caglayan, Ph.D. & Alison F. Whittemore, Ph.D.
2:15 PM	Epic Catholicism: The 28th International Eucharistic Congress and the Coming of Age of an American Religion Adrienne Ambrose, Ph.D.

Thursday, February 25, 2016

- 12:00 PM **Welcome**
Osman Ozturgut, Ph.D., Dean, Office of Research and Graduate Studies
- 12:10 PM **A New Way to Tackle Diabetic Macular Edema**
Narges Kasraie, OD, FAAO
- 12:35 PM **Today & Tomorrow: Attitudes and Expectations Moving Beyond the Patient Protection and Affordable Care Act (PPACA)**
John W. Hancock, MBA & Annette E. Craven, Ph.D., CPA
- 1:00 PM **Mentors Offering Maternal Support (M-O-M-S™): Findings from a Randomized Control Trial of Program Effectiveness**
Karen L. Weis, RNC-OB, Ph.D., FAAN, Regina P. Lederman, RN, Ph.D., FAAN, Katherine C. Walker, RN, MSN, Monika Valentin, LPN, & Wen Chan, Ph.D.
- 1:25 PM **Synthesis of Novel Fluoroquinolones with Staphylococcal Activity**
Isaac Garza, M.S., Raghunandan Yendapally, Ph.D., Cynthia Franklin, M.S., Helen E. Smith, Ph.D., Marcos A. Oliveira, Ph.D., Miranda Jarrett, B.S., & Richard Lee, Ph.D.
- 1:50 PM **Short-chain fatty acid histone deacetylase inhibitors produced by gut commensal bacteria modulate class switch DNA recombination and plasma cell differentiation to shape antibody response**
Ramsey O. El Benni, BBA, Helia N. Sanchez, Tian Shen, Julia R. Taylor, Hong Zan, Ph.D., & Paolo Casali, Ph.D.
- 2:15 PM **Social and Economic Factors Significantly Impact the Educational Attainment of Students in Rural China**
Shishu Zhang, Ph.D. & Gregory J. Soukup Sr., EdD
- 2:40 PM **Co-constructing meaning through qualitative interviewing: Researcher and participant dialogic learning**
Audra Skukauskaite, Ph.D., Melissa Gonzales, MS, Alma Fernandez-Villanueva, MEd, & Kimvy Calpito, MEd

PERFORMING ARTS ABSTRACTS

The Twelve Poems of Emily Dickinson by Aaron Copland

Orit A. Eylon, DMA

William Gokelman, MM on piano

The cycle is Copland's longest work for solo voice. Copland explained, "Each song is meant to be complete in itself, but I prefer them to be sung as a cycle. They seem to have a cumulative effect." Each poem is dedicated to a composer friend: David Diamond, Elliott Carter, Ingolf Dahl, Alexei Haieff, Marcelle de Manziarly, Juan Orrrego-Salas, Irving Fine, Harold Shapero, Camargo Guernieri, Alberto Ginastera, Lukas Foss, and Arthur Berger. Composed from 1949 to 1950, this collection constitutes the summit among his works for voice providing compositional maturity and deeply evocative style, and characterized by true, sober and profound emotion. Copland chose texts expressing the main themes of Emily Dickinson's poetry, Nature, Life, Love, Time and Eternity, showing perfect sensitivity and understanding of the poems. Although the composer "had no intention of composing a song cycle", only the seventh and twelfth songs have a clear thematic relationship, nevertheless he "preferred them to be sung as a cycle" as "they seem to have a cumulative effect". The work is very demanding and a singer with a wide vocal range is required to master the leaps and the sudden changes of register found in these songs. The musical phrases often tend to ascend and then linger on a higher note. The melodies adhere perfectly to the rhythm of the poems and Copland alternates vocal expansiveness with a more recitative-speaking style. Powerful as well as subtle and colorful singing and playing are needed throughout the cycle.

The poet, Emily Dickinson, was born in Amherst, Massachusetts, in 1830. She attended Mount Holyoke Female Seminary in South Hadley, but returned home after a year. From then on, she rarely left her house and her visitors were few. By the 1860s, Dickinson lived in almost complete isolation from the outside world, although she kept up regular correspondence and read widely. She spent much of her time with her family. Although Dickinson was extremely prolific as a poet and often sent poems in letters to friends, she was not publicly recognized during her lifetime. She died in Amherst in 1886. After her death, Dickinson's family discovered forty volumes of nearly 1,800 of her poems. The handwritten poems show a variety of the dashlike marks of different sizes and directions for which she is now known. Early editors removed the dashes and replaced them with more conventional punctuation. The first volume of her work was published posthumously in 1890 and the last in 1955.

This lecture presentation will show the synthesis of Emily's poetry to Copland's compositional style. Copland's artsongs are relatively few in number but most certainly of a noticeable quality, and was a sensitive composer on the synthesis of the accompaniments to the vocal line.

Two Pieces, Twelve Years: A Reflection on Creative Development

Ken Metz, PhD

Artina McCain, PhD on piano

This is the first the performance of two piano pieces composed twelve years apart and then a reflection upon aspects of composition, style, and artistic development (or regression?) The first piece to be performed, *Chunkie*, was composed in the summer of 2000. This is the third movement of a four-movement piano work entitled *Playscapes*. Each movement of the work is associated with memories from my adolescence. *Chunkie* pays tribute to an over-weight kid, Ricky Warfield, who was teased and bullied at the playground, until it was learned that his father had disappeared in the Bermuda Triangle. After the kids knew what had happened to his father they left him alone. Musically the piece has a clear formal structure and you will undoubtedly hear the influence of jazz. At that time that my music was very much influenced by Thelonious Monk, the jazz pianist. In fact my dissertation was a study of his musical style. This brings up one important aspect of my time working at UIW: as the years went by I tended to specialize and let go of the various areas of teaching when I started here. For instance, in my first few years I was the jazz band director as well as the theory teacher. I even taught music appreciation. In the middle years of my career I began teaching composition lessons. All these areas were eventually assigned to other instructors. Currently I only teach music theory related courses. This specialization has had an effect on my creative output and you may hear this in the next piece performed tonight: *Hermetitos #1* (2012). This is the first movement from a set of six pieces that pay homage to another great musician, Hermeto Pascoal, a wonderful Brazilian multi-instrumentalist and composer.

It is not easy to describe just how the years of teaching students about music of the common practice and Twentieth century have changed my music. One thing I see is that as I taught I also learned more about music. Some of the things I learned may have made it more difficult to compose because my standards became higher. In my opinion the second piece shows a growth in handling the basic elements of creating music. It shows how the music moved beyond the influence of jazz, yet the homage is to what may be considered a more popular style of music.

My special thanks to Dr. McCain for taking an interest in the music, performing it, and recording these and others of my pieces. Described as a pianist with “power and finesse”, Artina McCain, enjoys an active career as a solo and chamber performer, educator and lecturer. She has performed in the Czech Republic, Italy, China, Croatia and throughout the United States. Recent honors and guest artist appearances include: Austin Critics Table Award, Global Music Award and performances at the TAMIU Master Performers Series, Desoto Uptown/Downtown Concert Series and Zagreb Brass Festival. She graduated from Southern Methodist University (BM), Cleveland Institute of Music (MM) and University of Texas at Austin (DMA). More info at www.artinamccain.com

Birding (super flumina) Babylonis

Kevin M. Salfen, PhD

Richard Novak II, DMA, Tenor soloist; William Gokelman, MM, Conductor; Valerie Jeannin, Rylee Krkosa, Amy Phipps, and Cynthia Rael, Sopranos; Ariel Flores, Laura Grindle, and Kyrenda Rogers, Altos; Christopher Bendrell, Joseph Flores, and Andrew de Voogd, Tenors; Brandon Bulls, Kevin Salfen, and Darian Thomas, Basses

I describe ***Birding (super flumina) Babylonis*** as a “psalm-mandala,” by which I mean a combination of texts, one of them a psalm, meant to encourage contemplation of the relationship between seemingly disparate elements. It is a setting of the Latin version of Psalm 137, “By the rivers of Babylon. . .” troped with a setting of excerpts from the war journal of former U. S. Marine Jonathan Trouern-Trend. During his two tours in Iraq, Trouern-Trend wrote a blog, parts of which he later published as the book *Birding Babylon*, not about war, but about the natural world he encountered, especially the world of birds. Ultimately, this “psalm-mandala” is an imaginary place where the poetic vision of a twenty-first-century soldier can resonate with ancient voices yearning for their homeland. The *Birding Babylon* text is used with the kind permission of the author.

PODIUM PRESENTATION ABSTRACTS

Power Struggle: the Real Appeal of the Bennet Sisters

Olivia Almirudis

Romance, certainly, is one of the most appealing forms of a power exchange.

Jane Austen's most highly recognized and acclaimed novel, *Pride and Prejudice*, remains a staple of romance and continues to have a universal appeal to 21st century readers. Today, romance is advertised as sex in Victoria's Secret commercials, sold as racy *Fifty Shades of Grey* novels, and watched live on television on *The Bachelor*. The evident diversion from Jane's interpretation of classical and genteel romance delves into the question of why Austen's work continues to be regurgitated into modern means, such as Vlogs to the modern film adaptation, *Pride and Prejudices and Zombies*. The real appeal to *Pride and Prejudice* is that Austen addresses current issues regarding women's gender roles, voice, education, morality, and identity that daily effect society, culture, and people. Even today, Austen advocates for women through her work and continues to understand the struggles between women, men, and society.

Through the perception of sociological criticism the novel can be viewed as a means to directly analyze society and address societal issues, which parallel to contemporary topics (Tyson, L., 2014). In order to reveal these issues, Austen uses the five Bennet sisters to probe at society. The lovely eldest daughter, Jane, represents the female struggle to find her role as a woman in society through her relationship with Mr. Bingley and her sisters. Feisty Lizzy fights to retain her voice from domineering men, such as Mr. Collins and Mr. Darcy, overbearing women, such as Lady Catherine de Bourgh, and her bothersome Mama, Mrs. Bennet. Mary, contrary to her sisters who search for eligible matches, seeks to maintain her education as her life's priority. Lydia, who elopes with the dastardly Mr. Wickham, questions the purpose of morality, and Kitty, who is neither talented nor married, represents the lost woman, who has no place in society.

Epic Catholicism: The 28th International Eucharistic Congress and the Coming of Age of an American Religion

Adrienne N. Ambrose, Ph.D.

This paper presents my research on the 28th International Eucharistic Congress, held in Chicago in 1926, and the ways in which this public display of Catholicism became a turning point for the visibility and acceptance of the faith in the US. Drawing upon research conducted at the Chicago Archdiocesan archives, generously supported by a Research Grant from the Office of Research & Graduate Studies, my work examines how a well-documented appetite for spectacle ensured that the massive religious gathering would find a receptive audience. In particular, I explore how the formidable influence of Hollywood as an exploding American industry was an important, although largely unacknowledged, force in shaping how the Chicago Congress was promoted, experienced and represented.

Originating in late 19th century France, Eucharistic Congresses had been celebrated on a roughly bi-annual basis ever since, and were promoted by the Catholic Church as a way to increase devotion to the sacrament among both clergy and laity. The 28th Congress in Chicago was the first to be held in the United States, and was seen by planners and attendees as an opportunity to display central, distinctive aspects of the faith. Its widespread coverage in local and national media is one measure of the reception the Congress received, and that will be examined for the purposes of this presentation.

My focus addresses a lacuna in scholarship on 20th century American Catholicism. Although many studies have examined the instrumental role that Catholic leaders played in the campaign to censor film in the 1920s and 1930s, little attention has been paid to the way in which the religion's interaction with the developing film industry influenced public expressions of the faith. Given that American Catholics continue to be shaped by earlier manifestations of Catholicism in this country, I am convinced of the value of investigating the variety of factors that gave rise to the public face of the religion in an important period of transition – the 1920s.

Developing Definitions of Music Education in the High School Ensemble with the Application of Innovative Teaching Methods

Joseph D. Flores, Music Education Student, & Orit A. Eylon, DMA

This presentation aims to discuss three things: 1) the four main components of Music Education, 2) how developing definitions for “Music Education” and its four components alongside students can aid in the long-term retention of content and the development of high-order thinking skills, and social and emotional intelligences supported by developmental theorists, and metacognitive skills; and 3) the ways in which innovative teaching approaches such as flipped and blended classroom structures can create time to develop these skills and engage students in activities capable of building deeper understandings of content.

The first part of this presentation discusses the categorizing of “Music Education” into four “strands” using The Texas Assessment of Knowledge and Skills’ Music Curriculum Framework, as well as perspectives of other influential works such as psychologist Carl E. Seashore. The four strands are defined in ways describing their educational goals, benefits to students in a music course, and relevance to music as a discipline. Categorizing the music discipline will help organize it into ways that can be relayed to students to foster schema and prior knowledge building that have been shown to effectively promote content understanding.

Secondly, this presentation examines the benefits of discussing and defining the above four strands of music education. Research into higher-order thinking skills, defined by Benjamin Bloom, and “intellectual quality,” as discussed by Pauline Gibbons, helps develop ideas in which this work benefits students’ personal growth and long-term memory of content. Work done on schema, scaffolding, prior knowledge, and motivation is addressed to show the importance of defining key aspects of music education to students, referencing works by Jean Piaget, Lev Vygotsky, other scholars. These higher-order skills not only relate to needed life skills outside of school, but enrich learning and teaching in the classroom.

This leads into the discussion of several innovative teaching styles to aid in meeting the above goals. Data on the effectiveness of these approaches highlights their ability to relay content more effectively than normal lecture classrooms. Observations and statements from researchers and teachers also add in their ability to foster higher-order thinking activities, metacognitive tasks, social and emotional intelligence, and general life skills. The shown innovative methods also have been advocated to “create time” for both teaching content and reinforce understanding leading to the positive results being shown throughout an increasing pool of users.

Utilizing newer teaching methods, with the ideas of creating effective schemas, prior knowledge, motivation, and metacognition, can help create quality student learning, as well as time to teach more. Fostering these skills in the ensemble classroom is of the utmost importance because they are necessary in the performance of sophisticated musical repertoire and sought after in the workforce. Although there are extra topics to cover in the classroom, it is incumbent upon educators to find ways in which to apply these principles to their content regardless of discipline. These methods can be the answer.

**International Doctoral Students Research Learning Experience in a Ph.D. Program at
University of the Incarnate Word (work in progress)**

Audra Skukauskaite, Ph.D., Sandra Durden, Doctoral Student, and Sadeq Sohrabie, Doctoral Student

Large numbers of international students are enrolled in U.S. colleges and universities filling enrollment gaps, contributing to the diversity of universities, bringing international experience in the classrooms, helping in building and sustaining U.S. research and development superiority, and contributing an estimated \$13 million dollars annually to the U.S. economy (Obsd and Forster, 2011). International students differ from local students and face unique challenges in such areas as limited English proficiency, cultural misunderstanding, and instructor or peer attitudes (Killian, 2001; Mittal & Wieling, 2006; Ng & Smith, 2009; Nilsson & Dodds, 2006).

In recent years, professional organizations and scholars have highlighted the need for further research about doctoral programs and the research learning of doctoral students to inform the instruction and preparation of current and future cohorts of education researchers (American Educational Research Association, 2006; Anderson, 2002; Eisenhart & DeHaan, 2005; Golde, 2007; Shavelson & Towne, 2002; Young, 2001). In his analysis of 995 articles, Jones (2013) suggests that studies on doctoral education concentrate on issues such as attrition, supervisor relationships, supervisor quality, and social isolation. These issues can be especially problematic for doctoral international students who often end up feeling lost, anxious, and uncertain about their progress or academic study strategies (Evans & Stevenson, 2010). This is of particular importance for the University of the Incarnate Word (UIW), where international doctoral students makeup a significant portion of the total number of interdisciplinary Ph.D. students.

In this qualitative study, we investigate the question, “What are international doctoral students’ experiences of learning research at the University of the Incarnate Word?” A qualitative interpretive approach is used to allow international students to share their perspectives and experiences (Lichthman, 2013). Four face-to-face, semi-structured interviews were conducted, each one approximately 35 – 55 minutes in length. Criteria for student selection were: current enrollment in the UIW Ph.D. program, student visa status, fewer than 7 consecutive years of U.S. residency, and completion of at least one doctoral-level research methods course or previous research experience.

Five levels of analysis were constructed using an iterative approach starting with induction and then implementing revisions based on the data analysis information. Spradley’s (1979) semantic relationship of strict inclusion, “X is a kind of “Y”, from his DRS method was used to construct and analyze domains (key terms) and taxonomies. We extracted three major taxonomies and 16 domains through line-by-line transcript analysis. The first taxonomy, challenges to research learning, included five domains: collaboration challenges, language challenges, reading challenges, topic challenges, and writing challenges. The second domain, change in research learning, included the five domains of course attendance and readings, dissertation defense attendance, graduate assistant experience, practicing research, and research symposium attendance and participation. The last discovered taxonomy was support for research learning which included six domains: collaboration support, Graduate Support Center (GSC), library resources, peer support, professor support, and writing coach. Overall, we found that international doctoral students may not actively seek out help and support and described learning about research through methods course attendance and through engaging or practicing research.

Co-constructing meaning through qualitative interviewing: Researcher and participant dialogic learning

Audra Skukauskaite, Ph.D., Melissa Gonzales, MS, Alma Fernandez-Villanueva, M.Ed.,
Kimvy Calpito, M.Ed.

The purpose of this study is to examine researcher and research participant perspectives about research and qualitative interviewing when engaging in reflexive analyses of the interview experience. We demonstrate how interviewers and interviewees actively co-construct meanings during the interview and afterwards (Holstein & Gubrium, 2012).

Dialogic interviewing is an integral component in qualitative research, yet there is limited research about the reflection, meaning, and understanding experienced by the researcher and interviewee taking part in dialogic interviews (Brinkman & Kvale, 2015). Reports from interview studies still often focus on the researcher interpreting data in isolation and participant perspectives and contributions to the interview remain invisible, even in research that emphasizes responsive interviewing (Rubin & Rubin, 2013). This study will contribute to the literature on qualitative interviewing by making the researcher and participant perspectives visible.

This podium presentation will be based on analyses of an interview as well as participant and co-researcher interviewing experiences conducted within a Qualitative Research Design class. These interviews, led by student-co-researchers, were conducted under a larger, IRB-approved study on doctoral student learning of research. This research is grounded in an ethnographic perspective that keeps researchers accountable to participant insider perspectives within context. Focusing on insider meaning enables researchers to include participants as co-researchers, enabling them to document and analyze their own learning and experiences (Bloome, Carter, Christian, Otto & Shuart-Faris, 2005; Rex & Schiller, 2009).

Data for this presentation includes reflections on the interview; interview audio recording and transcriptions; and audio recordings of dialogues that took place in preparation for the presentation. The student co-researchers and the participant came together to discuss their learnings and notes, engaging in a dialogic participatory analysis of their experiences (Richardson, 2002; Wolgemuth, Erdil-Moody, Opsal, Cross, Kaanta, Dickmann & Colomer, 2015). Data were analyzed in three phases. First, we used Spradley's (1980) Developmental Research Sequence approach to identify key terms from individual reflections. Then, we utilized domain analyses to identify domains (core concepts) across the reflections. We also examined other data for included terms that contribute to the initial domains. Third, domains were analyzed for interrelationships to create taxonomies that represented both participant and interviewee learning through dialogic interviewing.

Through the dialogic analyses of the interview and reflective data, the researchers and the participant-turned-co-researcher demonstrate the importance of building trusting and collaborative relationships. These relationships become instrumental in co-construction of meaning and learning within and from the interview. The dialogic participation also makes visible layers of perspectives and activities that play a role in producing and validating knowledge within qualitative research. The overall outcome of the research led to validating the need for the participant to be actively engaged in co-constructing meaning with the interviewer throughout the research process. This led the research to become more authentic through meaningful dialogue. The participant was able to expand, clarify, and retell parts of their experience which added to the interpretations previously found by the researcher.

Synthesis of Novel Fluoroquinolones with Staphylococcal activity

Isaac Garza,MS, Raghunandan Yendapally,Ph.D., Cynthia Franklin,MS, Helen E. Smith,Ph.D., Marcos A. Oliveria,Ph.D., Miranda Jarrett, B.S.

Antimicrobial resistance is increasing in many clinically relevant strains of bacteria, leading to antibiotic therapies that are ineffective or inappropriate. The purpose of this study is geared towards the discovery of new drugs that are active against these emerging strains of bacteria.

This study describes the synthesis of several novel fluoroquinolones followed by an evaluation of their bioactivity against *Staphylococcus aureus* and other strains of bacteria. *S. aureus* is a common human pathogen that causes Skin and Soft tissue infections (SSTIs) as well as produces a significant number of hospital acquired infections. One important drug therapy to treat *S. aureus* infections are fluoroquinolones. Fluoroquinolones are a class of antibiotics that kill or inhibit the growth of bacteria and specifically inhibit the activity of DNA gyrase, which is essential for DNA synthesis and bacterial replication.

The fluoroquinolones we designed and synthesized were guided in part by a recent study of a new isothiazoloquinolone derivative, ACH-702, which showed potent antibacterial activity against methicillin-resistant *Staphylococcus aureus* (MRSA)(Wang and Wiles 2007).

First we synthesized new fluoroquinolones guided in part by the chemical structure of ACH-702. We have characterized our compounds using NMR (Nuclear Magnetic Resonance) and determined purity by HPLC (High Pressure Liquid Chromatography). Second, we systematically evaluated the new compounds for their bioactivity using a micro broth MIC (minimum inhibition concentration) assay. Finally, we evaluated some of the compounds for their ability to inhibit the *S. aureus* gyrase enzyme using an in vitro assay.

Overall, several of our fluoroquinolone compounds (RY12, RY13, RY19) showed activity in inhibiting *S. aureus* in the micro broth MIC assay. At least one compound (RY19) showed activity in inhibiting purified *S. aureus* gyrase using the in vitro enzyme assay. These results, showed that some of our compounds are active against *S. aureus* and are therefore good drug candidates that warrant further research and development.

Today & Tomorrow: Attitudes and Expectations Moving Beyond the Patient Protection and Affordable Care Act (PPACA)

John W. Hancock, MBA, and Annette E. Craven, Ph.D., CPA

Objective: The most recent health care reform in the United States was the major overhaul, primarily to the insurance framework, known as the Patient Protection and Affordable Care Act, or PPACA. Much research has been done prior to this legislation's implementation regarding opinions and projected effects. However, very little research has been done after implementation to evaluate current opinions on PPACA itself and whether further reform is needed. The purpose of this study is to evaluate health care consumer perspectives of recent healthcare reform and what further efforts should be done. Additionally, we hope to provide solid evidence of the current consumers' perceptions of what future health care reform should focus on.

Methods: This is a qualitative pilot study in which health care consumers were surveyed via SurveyMonkey.com. The "snowball" method was used to generate maximum exposure to potential survey takers.

Results: Data has been gathered and analyzed. The results contained complete responses from 169 individuals. Results show consumers believe further reform is needed. Focus should be placed on cost and quality. Additionally, age, gender, and political affiliation are all statistically significant indicators of how people form their opinions on health reform.

Conclusion: Further health care reform is needed, however, the politicization of health care policy issues is likely to negatively affect the ability of future reform to be successful. Individuals base their health care reform opinions on factors unrelated to actual health care.

Keywords: Patient Protection and Affordable Care Act, Affordable Care Act, PPACA, ACA, Obamacare, Healthcare, Health Care Reform, Health Care Consumers, Future Health Care Reform.

World Bank Tax Advice to Latin America: Does it Foster Inclusive Development?

Michael J. McGuire, Ph.D.

The poverty and inequality of Latin America are extreme, but there are solutions. The best solution includes a process of “inclusive development” in which everyone participates according to his or her potential and earns an income necessary to live a dignified life. Inclusive development is promoted by providing the basic goods and services to the poor that increase their productivity, and so enhance their opportunities for employment and income.

The federal government necessarily plays a key role in supplying these basic goods and services. A crucial question is: How should governments raise the funds necessary for paying the costs of supplying them? Given the extreme poverty and inequality of the region, *progressive* taxation (in which the wealthy pay a relative large share of their incomes) seems reasonable. First, progressive taxation is capable of raising the necessary government funds – and raising them fairly. Second, progressive taxation leaves more after-tax disposable income in the pockets of the neediest for paying the private costs of satisfying basic needs.

Surprisingly, the World Bank has recommended that governments fund the satisfaction of basic needs through *regressive* taxation in which the neediest people pay a relatively large share of their incomes. One justification has been that progressive taxation is not politically feasible in the very unequal countries of Latin America; realism suggests raising revenues through regressive taxes, and then spending these revenues to satisfy basic needs.

One problem with regressive taxation is that the government takes with one hand and gives with the other. This can, for example, result in providing new schools for children who come malnourished and incapable of learning.

The World Bank is influential, in part because the Bank makes its tax recommendation a condition of receiving development loans—all of Latin America has adopted the Bank’s advice to tax regressively. The purpose of this study is to conduct an empirical test of the World Bank’s tax advice in Latin America. Economic literature indicates that four explanatory variables are crucial in explaining the satisfaction of basic needs: literacy, income distribution, clean water, and medical services. This study collects World Bank “panel data” on these variables for 14 Latin American countries between 1990 and 2005. Next, International Monetary Fund tax data on the same countries and time periods is collected and used to construct two additional explanatory variables: a Tax Regressivity Index and a Tax Progressivity Index. Random Effects regressions of all six explanatory variables on Life Expectancy (a proxy for the satisfaction of basic needs) indicate that regressive taxation contributes virtually nothing to satisfying basic needs (coefficient = -0.0004; $P > |z| = 0.976$), but *progressive* taxation has a positive and statistically significant impact (coefficient of the natural log of the Progressivity Index = +0.6721; $P > |z| = 0.095$).

The implication is that the World Bank made a catastrophic mistake in recommending regressive taxation to Latin America. Despite the difficulties, Latin Americans should raise once again the banner of progressive taxation and resolutely march forward.

Social and Economic Factors that Significantly Impact the Educational Attainment of Students in Rural China

Shishu Zhang, Ph.D. and Gregory J. Soukup Sr., Ed.D.

Recent social and economic changes in China have made it increasingly difficult for families to send their children to school (Sun, 2000). Many families feel “education is useless in rural China” (Shek, Tsoi et al., 2001) and are sending their children to work in big cities to help ease economic burdens (Tabachnick & Fidell, 2001). The researchers analyzed data from the Chinese Household Income Project (CHIP 2002, CHIP 2007) to determine significant social and economic factors that impacted educational attainment of students in rural China.

To provide a more complete picture of how specific factors impacted the educational success of students the researchers analyzed the academic performance and extracurricular activities of students in rural China. T-tests were used to determine how educational expenses and extracurricular activities significantly impacted student success at different educational levels. Multi Regression and multi logit analyses were used on the CHIP 2002 survey dataset (7241 observations). The dependent variable for the 2002 survey was school years completed by the student and the independent variable was student extracurricular activities. Other control variables included the age of the student, parental expectations and family expenses. A multiple regression analysis was used on data from the CHIP 2007 survey (342 observations) to study significant factors that impacted school enrollment in rural China. The dependent variable for the 2007 survey was student population and the independent variable was the number of teachers per village. Other control variables analyzed included teacher salaries, student travel time to school and the physical condition of schools.

T-tests determined that the yearly educational expenses for students from different grades were significantly different from each other and significantly increased as students advanced from primary school to college (doubling each time they advanced to new educational levels). The highest average school expenses were 6,845 yuan per year for college students and 427 yuan per year for elementary students. Multi regression analysis of the CHIP 2002 survey determined that several factors increased rates of educational attainment of students like higher parental expectations, time spent after school engaged in physical chores and time watching television. The multi regression analysis of the CHIP 2007 determined that more teachers living in a village and shorter travel times to school for students were associated with more students enrolled in schools.

The researchers recommend that the Chinese government provide greater funds to attract more faculty and administrators back to the Chinese countryside and to encourage greater educational opportunities and success for students in rural areas.

Mentors Offering Maternal Support (M-O-M-S™): Findings from a Randomized Control Trial of Program Effectiveness

Karen L. Weis, RNC-OB, PhD, FAAN, Regina R. Lederman, RN, PhD, FAAN, Katherine C. Walker, RN, MSN, Monika Valentin, LPN, Wen Chan, Ph.D.

Prenatal and postpartum maternal psychosocial stress, anxiety and depression are associated with poor birth outcomes, poor maternal-fetal and infant attachment, and long-term infant/childhood cognitive delays. The implications of these associations point to the need for prenatal assessment and intervention for the psychosocial stress of pregnancy and depression. The Mentors Offering Maternal Support (M-O-M-S™) prenatal support program focuses on pregnancy-specific anxiety and depression known to be predictive of poor birth outcomes. The intervention program was specifically designed and piloted for military women. The purpose of the study was to test program effectiveness in a randomized study with military women over a three year period.

Participants were 240 military women recruited, consented and randomized to M-O-M-S™ intervention or normal prenatal care with no participation in M-O-M-S™. Participants completed a battery of psychosocial measures at baseline and in each trimester. The first of 8 M-O-M-S™ classes started in the first trimester and were offered every-other-week for one hour. Trained military wives & mothers (mentors) facilitated classes.

Sample ages ranged from 19-39 years with 62% of the women pregnant with their first or second child. Over 80% were married to active duty men, with 30% of the sample being either active duty member or a dual military family. Longitudinal models for each of the DVs were created controlling for ethnicity, marriage length, age, educational status, deployment of spouse during pregnancy and whether the pregnancy was planned or unplanned. Statistically significant differences were found for participation in the M-O-M-S™ for increased feelings of well-being for self and one's unborn child ($p < 0.003$). M-O-M-S™ participants had statistically significant increases in their perceived feelings of emotional support ($p < 0.000$)/social support ($p < 0.02$) and acceptance ($p < 0.04$).

There is a lack of longitudinal studies, testing the effectiveness of prenatal assessment and intervention programs for decreasing psychosocial stress and anxiety of pregnancy, particularly within a military population. The findings from this study provide evidence to support the effectiveness of a prenatal mentored-support program for decreasing psychosocial stress of pregnancy. The findings related to prenatal well-being are both statistically and clinically significant. Fears related to well-being during pregnancy are predictive of maternal attachment and depression. Research indicates that military women indicating lower self-reliance and social support have high incidence of postpartum depression. The positive results for increased acceptance (an element of coping) are important for military women faced with frequent unexpected changes and family separations. Ongoing research efforts will focus on sustained results for maternal-infant attachment, role satisfaction and depression.

A New Way to Tackle Diabetic Macular Edema

Narges Kasraie, OD, FAAO, Diplomate of ABO

Many diabetic patients' ocular health and vision become compromised as a result of the changes that may occur in their eyes. Diabetic retinopathy is considered a common complication in diabetic patients, and may cause permanent vision loss if damage to the retina occurs. The risk of retinopathy and ocular complications are known to increase over time in patients with diabetes. Therefore, it is very important to evaluate and treat diabetic retinopathy in a timely manner in order to help minimize permanent vision loss especially when there is macular edema secondary to diabetes (DME).

The current treatment options for treating DME include anti-vascular endothelial growth factor drugs, steroids and laser photocoagulation. This presentation is a review of literature which will mention some of the existing data regarding the current known prevalence of the diabetic retinopathy (DR), and macular edema among diabetic patients, and the focus of the discussion is going to be on one of the newer anti-VEGF treatment options that is currently available, since anti-VEGF drugs are considered a popular treatment option for DME. More specifically, this presentation will discuss a new drug called Eylea (aflibercept), which was approved by the FDA in the U.S. on July 29th of 2014 for treating DME, followed by an approval for this drug by the European Commission for the treatment of visual impairment secondary to Diabetic Macular Edema (DME) on August 11th of 2014. This drug is particularly interesting since the FDA exercised its power to designate Eylea as a "breakthrough therapy" at the sponsor's request, since the preliminary clinical evidence suggested that the drug may be able to provide a substantial improvement over other available therapies for patients with DME.

Eylea is considered a vascular endothelial growth factor (VEGF) inhibitor and was previously approved in the U. S. for the treatment of other ocular problems including wet age-related macular degeneration (AMD), macular edema following retinal vein occlusion (RVO), and now for treating diabetic macular edema (DME). Eylea is available as a single, 2 mg dose for intravitreal injection for all approved indications. It has been recommended that Eylea should be used as a 2 mg intravitreal injection in patients with DME, every two months (8 weeks) after the initial monthly injections for five consecutive months. This presentation will focus on discussing this new treatment option and its safety and efficacy, and its possible side effects.

Study of the use of Vernier tools to Advance Concept Visualization in a Classroom Environment

Okan Caglayan, Assistant Professor, and Alison F. Whittemore, Department Chair, Associate Professor

Efficiency in student learning can be expanded by going above and beyond finding solutions to simple textbook problems. These problems are usually ideal cases, and often have limited connections to real world situations. However, when students can think and act like true scientists in the classroom, they improve their understanding and develop strong problem-solving and critical thinking skills. As educators, we can create a classroom environment which promotes students' creativity by utilizing open-ended projects that investigate realistic, inventive, and complex problems. This approach not only boosts student enthusiasm, but also aligns classroom topics more closely with contemporary industrial environments and practices.

This paper is a case study on Vernier tools – LabQuest 2, Logger Pro and LabQuest Viewer. The study aims to bridge the gap between theoretical and experimental data analysis in a classroom. It is critical to have a data visualization tool that can communicate the features of the dataset in an efficient and effective way. These products provide real-time data collection from sensors and transfer the data to a computer station. The results can be presented as graphs, tables and charts, which are major features of scientific and engineering presentations. This case study examines the process of integrating this equipment into the classroom environment.

Through observations, interviews, surveys, and examination of student work, we will be comparing the impact of the study and changes in pedagogy for the courses designed by using Vernier tools versus courses taught in a traditional format. The primary focus of the study is currently on the Engineering Physics courses. On the other hand, the versatility of the Vernier tools provides the opportunity to expand the study to the other branches of scientific courses. Though this case study is still an ongoing project, initial outcomes include increased ability of faculty to visually explain complex problems, increased ability of students to conceptualize engineering problems and increased engagement of students by incorporating visualization tools in the classroom environment.

POSTER PRESENTATION ABSTRACTS

Student Evaluations Effect on Professors' Occupational Commitment, Intention to Quit, Confidence, and Affect

Stephanie S. Boswell, Ph.D., Danielle R. De Luna, B.A., Antoinette M. King, Psychology Student

On Ratemyprofessors.com (RMP), students rate instructors on easiness, clarity, and helpfulness and provide open-ended feedback. Kowai-Bell et al. (2011; 2012) studied effects of RMP commentary on professors, finding that confidence about future teaching was affected more by positively valenced than negatively valenced commentary. This project investigated effects of student evaluation origin (RMP/university-administered student evaluations of teaching [UASET]) and valence (mostly positive comments/mostly negative comments) on professors' occupational commitment (OC), intention to quit (ITQ), confidence, and affect toward future teaching (AFT).

On RMP, students anonymously rate instructors and provide open-ended feedback. Most RMP research has focused on effects of RMP commentary on students' course expectations and academic behavior. However, Kowai-Bell et al. (2012) studied the effect of RMP commentary on professors and found that professors' confidence about future teaching was affected more by positively valenced than negatively valenced commentary. OC is an individual's attachment/intention to remain in a career (Hackett, Lapierre, & Hausdorf, 2001). OC is related to motivation for and sustained investment in activities that improve work-related performance; it is also related to employees' ITQ (Lee, Carswell, & Allen, 2000). Given that both UASET and RMP evaluate work-related performance, and this is often the only form of feedback that some professors receive, it is possible that they could affect professors' occupational commitment and ITQ. This study also investigates their effect on confidence and AFT.

Recruitment emails were sent to randomly selected instructors at American universities. Respondents ($n = 72$) were randomly assigned via Survey Monkey to one of four experimental conditions: 1) RMP/mostly positive, 2) RMP/mostly negative, 3) UASET/mostly positive, or 4) UASET/mostly negative. Participants read five comments, imagining that they were the teacher being evaluated, as they used a 9-point, Likert-type scale to rate agreement with statements about OC (8 questions; Hackett, Lapierre, & Hausdorf, 2001), ITQ (3 questions; Hackett, Lapierre, & Hausdorf, 2001), confidence (1 question), and AFT (1 question).

A multivariate analysis of variance found no effect for evaluation origin/type on the dependent variables. However, valence significantly affected all study variables. Follow-up univariate analyses of variance found that those reading mostly negative feedback reported significantly greater intention to quit and poorer OC, confidence, and affect about teaching ($p < .05$).

Given that the only feedback many professors receive regarding their teaching is from UASET and RMP, these findings suggest that students' feedback has a significant ability to impact motivational aspects of professors' thinking. In the absence of consultative support or training on how to interpret student feedback, professors may not know how to glean useful information from student evaluations or how to utilize that feedback. Moreover, if the feedback is disproportionately negative, professors may feel overwhelmed and incapable of making changes to improve it (Roche & Marsh, 2000). Professors may benefit from coaching on how to glean useful information from student evaluations. Lewis (2001) suggests the creation of a rubric that can be utilized to organize students' narrative feedback. Lewis (2001) recommends organizing the rubric with categories often cited as components of effective teaching.

Visual Rhetoric in the Courtroom Sketches of Guantanamo’s Military Tribunals

Letitia Harding, Ph.D.

In this study I examined artist Janet Hamlin’s courtroom sketches of the Guantanamo Bay 2006-2013 military tribunals, and analyzed the United States government’s use of these documents to address the general public’s desire for transparency.

After the terrorist attacks on the United States on September 11, 2001, the President signed an executive order decreeing that non-citizens who were suspected of terrorist activities against the United States could be detained and tried by military tribunal. Many of those detainees were incarcerated in Guantanamo Bay, Cuba. Military tribunals began in 2006, and while some reporters have been allowed to observe the proceedings, public access to information has been sparse.

In 2013, Hamlin published a book of officially sanctioned court sketches of the Guantanamo military tribunals, giving the public a rare opportunity to “see” inside the courtrooms. Much of the impact of the Hamlin sketches lies within the pathos exerted through the images of the detainees and their surroundings. The presenter will discuss her close analysis of the sketches, the unique role and obligation of the artist to document the tribunals ethically, and the U.S. government’s determination to control the dissemination of information. Rhetoricians have always closely studied the motives of those in power and, in this case, a visual rhetorical analysis provides insight into the ongoing ideology, gamesmanship, and political positioning of the U.S. government.

Because the aim of this study was to examine not only the images, but also the motivation behind their production, it was necessary to bring together an analysis of the sketches themselves and the rhetorical and political influences guiding the actions of their producer, and the government officials who controlled their dissemination. Thus, this study focused on the rhetorical strategies employed by the artist, and by those who managed their distribution, or lack thereof, as a means of exercising power over the American public. Utilizing a social semiotic analytical approach to the sketches, which allowed me to focus on how they were produced rather than solely on their uses, I examined not only their ability to influence their intended audience, but also the potential relationships between producer, controllers, and viewers of the content. This approach offered a means of analyzing the relationship between the images, social interaction, and power.

Some of the most astounding conclusions that stem from this study revolve around the different purposes of the producer and those who cleared the sketches for public release. On a micro-level of social order, Hamlin offers insight into the humanity and sometimes even vulnerability of the Guantanamo detainees, while on the macro-level, the U.S. government maintains complete control over which of Hamlin’s sketches will be viewed.

There are many questions surrounding the Guantanamo tribunals and, while Hamlin’s sketches offer a glimpse into that secret environment, in many ways they incite even more questions: one of the most pressing is whether or not the United States government, instead of genuinely providing information to the public, was creating an illusion of transparency.

Instagram and Romantic Relationships

Antoinette M. King, Psychology Student, and Stephanie S. Boswell, Ph.D.

This study expanded the research on interpersonal electronic surveillance (IES) and social networking site (SNS) jealousy to Instagram (SNS jealousy has only been researched in Facebook; Muise et al., 2009). It was hypothesized that Instagram jealousy would be positively related to IES and a history of infidelity in one's romantic relationships.

Jealousy is the suspicion of unfaithfulness in a relationship; jealousy occurs when individuals believe that a threat has been made to their self-esteem and/or relationship (Muise et al., 2009). While SNSs can provide couples with a way to stay connected, IES, otherwise known as "creeping" or "lurking," may also occur (Tokunaga, 2011). Romantic jealousy may be related to the degree of IES that individuals perform on their partners. This study extends research about SNS jealousy and IES to Instagram. Instagram, and SNS, allows users to post pictures, write posts, and surveil others. It is important to study Instagram because it is the fastest growing SNS and likely the most popular social media platform in young adults (Mojica, 2015). There is no current literature exploring the relationship between IES, SNS jealousy, and cheating with regard to Instagram.

Participants ($n=134$; age range 18-49; average=21.28) completed the Instagram Jealousy Scale (adapted with permission from the Facebook Jealousy Scale; Muise, 2009; 7-point Likert-type scale) and IES Scale (lurking/creeping; Tokunaga, 2011; 5-point Likert-type scale). They also indicated if they cheated on or have been cheated on in a romantic relationship. The participants were recruited through social media and email and completed the study through Qualtrics.

The data were analyzed using a multiple regression; the model was significant, $F(1,131)=35.71$, $p<.001$; $R^2=.45$. IES alone significantly predicted Instagram Jealousy ($\beta=.67$, $t=10.26$, $p<.001$). The more individuals reported creeping (IES), the more they reported jealousy toward their partner on social media. Instagram Jealousy was not significantly predicted by a history of cheating on one's partner or having been cheated on by one's partner.

Jealousy has cognitive, emotional, and behavioral facets (Elphinston, Feeney, Noller, Connor, & Fitzgerald, 2013). The behaviors assessed by the IES scale likely overlap with the behavioral aspects of jealousy. An individual that tries "to monitor [his/her] partner's behaviors through his/her social networking page" may be acting on jealous feelings. This could explain the significant positive relationship between IES and Instagram jealousy. Contrary to the hypothesis, cheating was not positively correlated to Instagram jealousy or IES. This suggests that jealousy (perceiving others as potential threats to one's relationship) may not stem solely from past behaviors and experiences. An experiment may also be conducted to examine if manipulating jealousy on Instagram affects IES. Future research may investigate if more traditional measures of jealousy are related to jealousy specific to social networking platforms.

Changes in Undergraduates' Just World Beliefs

Lisa K. Lockhart, Ph.D.

The purpose of the study was to assess the just world beliefs, or the belief in the fairness or justness of society, of students in an undergraduate Social Psychology course on the first day of class and at the conclusion of the course. It was predicted that students' just world beliefs would attenuate over the course of the semester as they learned about the various situational forces that can affect people sometimes through no fault of their own.

Belief in a just world has been found to be associated with a lack of sympathy for those who experience misfortune (Rubin & Peplau, 1973; Jost & Hunyday, 2005). Social Psychology as both a field and as a course of study illuminates situational factors that can contribute to people's life outcomes. Thus, students' just world beliefs should decrease from pre- to post-course as their awareness of and understanding of the situational factors that may impinge upon behavior developed over the course of the semester. Such perceptions have important implications for social justice and civic engagement.

Participants ($N = 127$) were students in three semesters of a junior-level Social Psychology class (75% female; 57% Hispanic, 29% Caucasian, 9% African American; 55% Psychology majors). Participants completed the Just World Scale (Rubin & Peplau, 1973) on both the first day of class (T1) and on the last day of class (T2) as part of a larger course assessment. Students responded to questions such as "People who meet with misfortune have often brought it on themselves," and "Many people suffer through absolutely no fault of their own" (reverse scored) with a response scale ranging from 0, "strongly disagree" to 5, "strongly agree". Total possible scores ranged from 0 – 100, with higher scores indicating a greater endorsement of the just world theory, or a stronger belief that people deserve what they get and get what they deserve. Higher scores were expected to decrease after engagement in the course.

A paired samples t -test demonstrated a significant reduction in pre-course ($M=50.14$, $SD=8.34$) to post-course ($M=47.64$, $SD=9.26$) just world belief scores [$t(152)=4.03$, $p<.001$]. Further examination showed that this change was greater for non-Psychology majors than for Psychology majors. Students enrolled in courses such as Social Psychology may, in addition to increasing their knowledge about the various social psychological theories and concepts, also change their attitudes about the world and the people in it, potentially increasing their interest in and commitment to social justice. Further investigation into the implications for how potential individual differences affect this attitude change is warranted.

Undergraduates' Attitudes Toward and Perceptions of Research

Lisa K. Lockhart, Ph.D.

This was an exploratory study that was part of a larger study assessing students' attitudes toward and perceptions of research. The data presented here focused on students enrolled in Critical Thinking and Writing in Psychology. Students typically enroll in this course the semester following Introduction to Psychology. It was expected that participants' belief in the utility of research, primarily, and their own research efficacy, secondarily, would increase pre- to post-course.

Critical Thinking and Writing in Psychology is a required course for UIW Psychology majors. As stated, the purpose of this study was to assess students' attitudes toward and perceptions of research before and after completing this course, a sophomore-level orientation to the major and to research in psychology course. The course content should illuminate the essential role that research plays in the discipline of psychology. The readings, assignments, and lectures should serve to increase students' own belief in their ability to conduct research in psychology. These are assumptions that the faculty of the Psychology Department hold; in keeping with the evidence-based approach to psychology, it is important to ascertain whether these assumptions are supported by evidence.

Participants were a small subset of a larger group of students enrolled in Critical Thinking and Writing in Psychology ($n = 12$) who completed measures on both the first and last day of class; participants included in the final sample were individuals who fully completed both pre-test and post-test measures. Participants with incomplete pre-test or post-test data were excluded from the analyses. Measures assessed feelings toward research, perceived utility of research, and perceived ability to conduct research (Sizemore & Lewandowski, 2009), as well as a 7-point, Likert-type rating of intent to conduct a research project as an undergraduate.

A repeated measures MANOVA investigated the effect of time (pre vs. post-course) on the dependent measures of feelings toward research ($M_{pre}=14.50$; $SEM_{pre}=1.26$; $M_{post}=15.17$, $SEM_{post}=1.38$), perceived utility of research ($M_{pre}=13.83$; $SEM_{pre}=.71$; $M_{post}=12.17$, $SEM_{post}=.58$), perceived ability to conduct research ($M_{pre}=14.83$; $SEM_{pre}=1.08$; $M_{post}=14.58$, $SEM_{post}=1.28$), and intent to conduct a research project as an undergraduate ($M_{pre}=4.83$; $SEM_{pre}=.49$; $M_{post}=5.08$, $SEM_{post}=.47$). Contrary to prediction, no significant pre- to post-course differences were found [$F(4,8) = 1.87$, $p > .05$]. Data did not support the prediction that course content would lead students to develop a better understanding of both the value of research and of their ability to conduct research. This is consistent with other researchers' (i.e., Sizemore & Lewandowski, 1990; Holmes & Beins, 2009) findings that students' increased knowledge about research may not necessarily coincide with an increased interest in it. Moreover, Manning et al. (2006) suggested that undergraduates may lose interest in research after learning about its technicalities. Additionally, students who do not plan to attend graduate school may perceive research to be of little interest or value (Vittengl et al., 2004). Future research should investigate whether or not this phenomenon is due to the specific course content.

**Infant Approach/Avoidance Motivation to Friendly and Unfriendly Characters:
A Pilot Study of EEG Asymmetries**

Teresa Taylor Partridge, Ph.D. and Paisley Pauli, Graduate Student

The purpose of this research was to test whether infants show greater left than right activation when viewing videos of multiple positive vs. negative behaviors and whether this asymmetry is evident for static images of the agent.

To navigate the social world, infants, children and adults must develop skills in evaluating potential social partners. Infant evaluations may be informed by valence or familiarity based on facial characteristics (i.e., attractiveness, race, or expression) or voice (i.e., language or tone). Behavior is another important component contributing to attitudes about people and objects. Even infants evaluate behavior and prefer agents that perform positive behaviors over agents that perform negative behaviors. Hamlin et al. (2010) showed infants puppet shows of a wooden shape with eyes or an animal puppet performing positive and negative behaviors such as a square helping a circle up a hill and a triangle pushing a circle down a hill multiple times. They then gave the infant a choice between the positive and negative agent. Infants picked the positive agent more often than the negative agent.

Research into neural correlates provides potential into understanding the development of cognitive processes involved in social evaluation and potentially detect preferences before infants are willing indicate preference behaviorally. EEG asymmetry in the alpha band relates to approach/avoidance motivation in the frontal regions (F3/F4) as early as infancy (see Coan & Allen, 2004). Taylor-Partridge (2009) found that 6- and 10-month-olds displayed greater left asymmetry (i.e., approach motivation) to attractive faces compared to unattractive faces. Recently, Cowell and Decenty (2015) found that 12- to 24-month-olds show greater left than right activation when viewing a shape performing helping compared to hindering behavior.

Six infants (8- to 30-month) participated in an EEG study while they viewed videos of a square and triangle performing positive and negative behaviors toward a circle (helping vs. hindering, giving vs. taking, cleaning vs. messing up, and caressing vs. hitting). Assignment of valence to shape was counterbalanced. After each set of videos, a static image of both shapes displayed for 5 seconds. EEG was acquired using Biosemi. A frontal asymmetry index was calculated for each valence condition and each type of presentation (static vs. dynamic).

Paired sample t-test showed no significant difference for the video segments. Paired sample t-test resulted in a difference approaching significance, with greater left activation for static images of the positive agent compared to the negative agent $t(5) = 1.78, p = .06$. The effect size was large, $r = .78$.

The lack of significance for the video segment could be due to lack of power or due to the directional component of the activity confounding the asymmetrical processing of valence. However, the result for the static images suggests that infants are forming associations based on the behaviors of these agents and maintaining these associations when viewing the agents after the behavioral videos. Future directions will include younger ages and measures of temperament to establish developmental and individual differences in evaluation and attitude formation.

Use and Application of the Course Characteristics Survey in a Research Methods Course

Rachel T. Walker, Ph.D.

This study had three aims: First, it measured course enrichment dimensions and student outcomes in a research methods course. Second, it measured students' confidence in their ability to complete the research process from conceptualization to presentation. Third, it measured their comfort engaging in group work.

Historically, the job characteristic model has been used to assess outcomes (e.g. satisfaction, motivation, interest, etc.) and job core dimensions in the workplace (Hackman & Oldham, 1975). The five core dimensions include skill variety, task identity, task significance, autonomy and feedback. Previous research has identified that certain core job characteristics can enhance motivation not only in the job setting but also in the classroom setting (Bloom, Yorges & Ruhl, 2000; Catanzaro, 1997, Kass, Vodanovich, & Khosravi, 2011). Specifically, Bloom, Yorges, and Ruhl (2000) suggest that four of the core dimensions could provide a platform to heighten the classroom experience and be used as a guideline for course design or re-design. Finally, students are also often required to participate in group projects in certain courses. Part of the instructor's design of the course could also be used to create "group-working skills" that could be applied in employment settings (Maguire & Edmondson, 2001).

Students (n=18), enrolled in the first semester of the research methods course completed a modified version of the Job Diagnostics Survey (Bloom, Yorges & Ruhl, 2000) at mid-semester and end of the semester. The survey measured autonomy, task identity, skill variety, task significance and feedback and used a 7-point, Likert-type scale. Participants also completed measures of the student outcomes of motivation, interest, satisfaction, absenteeism and desire to withdraw. The responses were provided using 7-point, Likert-type scales.

Students (n=11) enrolled in the second semester of the research methods course completed a survey created by the researcher to measure confidence and comfort on the entire process of the two semester research project. Responses were measured using 5-point, Likert-type scale with (1) being not at all to (5) being very.

Students felt they were better able to accomplish their tasks without additional feedback from the professor ($M=17.36$) at the end of the semester than in the middle of the semester ($M=15.92$), $t(13) = -2.86$, $p=.013$. There was no significant difference between task identity, task significance, or autonomy ($p's >.05$).

T-tests also examined differences between student outcome between the midterm and end of the first semester of the course. Students felt that they performed better in the course at midterm ($M = 6.00$) than at the end of the semester ($M=4.78$), $t(13) = 4.89$, $p<.01$. There was no significant difference between motivation, satisfaction, absenteeism, and desire to withdraw, ($p's > .05$). This method was useful in examining if working with a partner would assist in certain aspects related to group work. Students also displayed high levels of confidence and comfort of different aspects of the research project process. A limitation is that fewer students participated in the study at the end of the second semester. Future research would be to repeat this process in research method classes.

Using a Workshop as an Intervention to Determine the Effect on Improving Teacher Certification Rates: A Randomized Multi-Phase Study

Renea Fike, Ed.D., David Fike, Ph.D., Elda Martinez, Ed.D.

The ultimate educational goal of preservice teachers is to graduate and become certified to teach. In Texas, an essential component of certification is passing two high-stakes state licensure examinations. This includes the TExES content exam for the candidates' certification area and the TExES Pedagogy and Professional Responsibilities (PPR) examination. A candidate who is unsuccessful on either of these two exams will be precluded from completing the certification process and will not be eligible to graduate as a completed certification candidate. The purpose of this study was to determine if candidate participation in an intervention (intensive workshop) conducted by the Educator Preparation Program (EPP) resulted in improved performance on the TExES PPR practice exam.

This study provided an intervention to help students prepare for the practice PPR exam. This intervention consisted of the PPR Review Series workshop with facilitated instruction, a scaffolded instructional approach and opportunities to reflect on field experiences to develop understanding of the PPR competencies. The focus was to help students improve their outcomes on the PPR state certification examination which must be passed in order to be certified to teach.

The study sample included undergraduate students enrolled in their senior-year professional development coursework, as well as Master of Arts in Teaching (MAT) students. Sixty-three eligible students were invited to participate in the study; 21 agreed to participate.

The study implemented a randomized experimental design. Academic and demographic data were analyzed. The analysis focused on intervention and control group learning outcomes as measured by performance on the practice PPR exam. Student's t-tests were used to compare practice PPR exam scores between the intervention and control groups. The research hypothesis was that the intervention group will demonstrate better learning outcomes than the control group. To test the association of student characteristics with learning gains, Pearson's and point-biserial correlation coefficients and one-way analysis of variance were used.

Pre-test scores did not differ significantly between the intervention and control groups. Post-test scores (mean = 80.14) for the Intervention group were significantly higher than post-test scores (mean = 71.43) for the Control group. The standardized effect size for the between-group difference in post-test scores was very large.

Point-biserial correlations and one-way analysis of variance were calculated to determine if gain scores (defined as post-test score minus pre-test score) differed based upon student demographics. Gain scores did not differ; the only variable for which gain scores differed was the group (Intervention/Control).

This study indicates that this facilitated intervention provided the review and support necessary to help pre-service candidates achieve success on their PPR practice exam. Candidates who received the intervention, the PPR Review Series, achieved nine points higher on their post-tests than the students who did not participate. The success of the intervention suggests the need to implement a similar program for all candidates who are preparing to take the PPR exam.

Utilizing VoiceThread for Research, Collaboration and Reflection: A Case Study of a Graduate Online Classroom

Sandra L. Guzman Foster, Ph.D.

The purpose of this study was to examine the impact of using VoiceThread technology in a graduate online classroom as a tool for research, collaboration, and reflection on educational topics covered in this course. The specific aim of this study was to determine the efficacy of the use of VoiceThread as a learning experience in an online course based on student perceptions.

Students can become empowered when they can reflect and connect curriculum with authentic activities through the application of digital tools such as VoiceThread, in an online classroom environment. VoiceThread is an interactive collaboration and sharing tool that enables users to add images, documents, and videos, and to which other users can add voice, text, audio file, or video comments. This type of tool can support learning and collaboration and mimic face-to-face interactions if utilized effectively. VoiceThread was used as a potential stimulus to strengthening assignment responses comprehensively.

A single case study of one classroom with 16 participants was conducted to gain an in-depth understanding of the impact of utilizing VoiceThread in an online graduate course. No control group was included. The case study aimed to answer the following question: *What are the implications of implementing VoiceThread in an online course where students are required to conduct research, collaborate, and reflect online?* Data collection methods included an open ended survey completed by students to gauge student perceptions of utilizing VoiceThread and a review of classroom projects and assignments that utilized VoiceThread. Grounded theory was used for the data analysis. Data were analyzed using codes and themes, and continuous interrogation was applied to include alternative interpretations and linkages.

After seeing how the students responded to the VoiceThread-based assignments and projects, much can be learned that will assist instructors in assimilating VoiceThread into an online learning environment. The following themes emerged from the data:

- Collaboration raised the level of thinking.
- Students felt an obligation to reflect about issues they have never thought of initially.
- Understanding of course information increased.
- Research was more focused.
- More opportunities for personal interaction.
- Increased engagement and motivation.
- Students development of new tech tool.

The findings correspond with existing research literature and give rise to several recommendations that can inform instructors and program directors who oversee online education. Students are more motivated to learn in the online environment when more effective learning strategies and tools are used. Online curriculum development is being adapted to encourage collaborative teamwork, facilitate critical thinking, reflection, and problem solving through a variety of technologies (McCormack, 2010). VoiceThread is one such tech tool that allows for a highly interactive learning experience in an online classroom. Designing instruction that integrates VoiceThread into the curriculum provides a wonderful opportunity for research, reflection, and collaboration among learners and supports a community of learners. Using VoiceThread can be very effective for presenting ideas and opinions, explaining “before and after” thoughts, collaboration, and interactive discussions.

What Can Jesus Teach Us About Student Engagement?

Glenn E. James, Ph.D., Elda E. Martinez, Ed.D., Sharon H. Herbers, Ed.D.

This study examined Jesus's teaching methods as described in the four Gospels, highlighting the ways in which He led listeners to participate actively in their own learning. The aim was to identify similarities and differences between the teaching techniques of Jesus and current practices in the field of student engagement. The research questions: What techniques did Jesus employ to teach adult learners? Are these techniques consistent with current research of student engagement?

UIW is a Catholic university with a Mission Statement incorporating education, faith, service, innovation, and truth. Faculty, staff, and students are challenged to practice Incarnational Spirituality on a day-by-day basis. Since this creates an imperative to understand what it means to follow in the footsteps of Christ as teacher, three lay community members went on a journey to find answers for themselves which could be shared within UIW and with a larger context of faculty in Catholic institutions.

We catalogued the stories in the four Gospels of the Christian Bible (The New Revised Standard Version Catholic Edition, 1989), concentrating on Jesus' direct interactions with people in accounts where we could discern some evidence of direct pedagogical exchange. We noted the setting, the audience, lessons, and the techniques used to engage listeners. These approaches were grouped and summarized. We searched the literature of student engagement for similar patterns and techniques. We reflected upon applications of these techniques in today's classrooms.

We identified three groupings in Jesus' teaching methods: His engaging use of narrative and analogies; other methods He employed, such as choice of setting, visual aids, deliberate timing, questioning, and case study; and a transformative learning process He modeled. Our study pointed to several practices that we recommend to faculty as valuable elements in their repertoire of student engagement techniques. These include: integrating storytelling; meeting students "where they are" in terms of technology, lack of confidence with interpersonal exchange, and evolving learning styles; incorporating visual and creative arts; increasing depth and breadth of questioning to foster critical thinking; providing case studies; and utilizing experiential learning, such as service learning.

Doctoral students' perspectives on learning research in the Ph.D. program

Audra Skukauskaite, Ph.D., Kimvy Calpito, M.Ed., Juanita Campos, M.A., Sandra Durden, M.A. Melissa Gonzales, M.S., Patricia Noske, M.A., David Perryman, M.A., Sadeq Sohrabie, M.B.A., Brenda Young, M.A.

The purpose of this study is to understand how doctoral students learn about research while conducting research studies within a Qualitative Research Design class.

Doctoral programs aim to develop doctoral students into quality researchers and contributors to their fields (Golde, 2006). However, there is limited research focusing on the experiences of doctoral students learning research (Lesko et al., 2008). Understanding doctoral students' perspectives and how they learn about research could contribute to the lack of literature on doctoral learning.

This poster presentation is based on interview analyses from four research studies conducted within a Qualitative Research Design class. The class worked in partners to conduct research by interviewing UIW doctoral students about topics related to learning research in the doctoral program. These studies were conducted under a larger, IRB-approved study on doctoral education.

Sixteen doctoral students were interviewed by 8 student-researchers from the Qualitative Research Design class. Each team, consisting of 2 student-researchers, interviewed two participants per team member and each researcher transcribed the interviews they recorded. The research partners then worked in teams to analyze all four interviews per team. Once all teams presented their research in class, the group came together to prepare this poster presentation on findings across the four teams. The interview transcriptions, the final class presentations and papers were analyzed to identifying commonalities in key ideas about what doctoral student participants shared about their learning of research in the Ph.D. program. Domain and taxonomic analyses of findings across teams led to uncovering key aspects of doctoral student learning.

By analyzing project findings collectively, the researchers found commonalities in their interviews with doctoral student participants in regards to perspectives on learning of research. The participants emphasized three factors when discussing their experiences of learning about research. The three common factors found consisted of learning beyond the classroom, experiencing challenges, and receiving support. Throughout the interviews, the doctoral students discussed that their learning of research was also done outside of the classroom, such as additional reading and taking advantage of research opportunities. Doctoral student participants experienced various challenges in their learning of research and overall studies. Examples of challenges were research topic development and writing skills. However, these doctoral students received support in different ways to overcome challenges, such as becoming more motivated by others, collaborating with peers, and utilizing university resources. In analyzing project findings collectively, we were able to better understand how doctoral students learn about research while conducting their own research. We hope to contribute to the literature on doctoral learning of research.

PhD Students' Experiences Learning to Research in Qualitative Research Design (INDR 8357)

Audra Skukauskaite, Ph.D., David Perryman, M.A., Mohammad Sohrabie, M.B.A., Melissa Gonzales, M.S., Sandra Durden, M.A., Juanita Campos, M.A., Kimvy Calpito, M.Ed., Patricia Noske, M.A., Brenda Young, M.A.

The purpose of the study is to examine what the PhD students who were enrolled in Qualitative Research Design during the Fall 2015 semester learned about research while conducting their class projects. Learning research is one of the central goals in preparing Ph.D. students to become scholars who can generate, transform, and conserve valuable knowledge (Walker, et al. 2008). Research on doctoral student learning of research is still limited (Lesko et al., 2008). Therefore, by examining what and how students learned in a qualitative research design class, this study contributes to a nascent area on doctoral student learning of research within doctoral programs. During the Fall 2015 semester in Qualitative Research Design, UIW doctoral students worked in pairs to conduct qualitative interview studies that included other doctoral students as participants. The studies were conducted under the larger program of study on doctoral student experiences and learning of research.

This poster presentation is based on analysis of the learning experiences of doctoral students. Data was collected through two exercises: 1) in-class group exercise on Nov. 12 during which students discussed what they learned from developing and giving their research presentations, and 2) in-class reflection exercise on Nov. 5 during which students wrote down their thoughts about six aspects of their learning: Lessons Learned through Presentations; Methodological Challenges; Joys, Epiphanies, and Rich Points; Qualitative Research; Their Research Study Topic; Partnering; and Learning about Self. Additional data sources included student reflections on their learning in their research notebooks, on course blackboard, and in their research papers.

The audio and textual data were analyzed using the Developmental Research Sequence approach (Spradley, 1980) to identify key ideas and draw conclusions about the students' experiences learning to research. Analysis began by identifying all student comments that related to the 7 aspects of learning discussed in the Nov.5 class. The next step involved 1) transcribing the audio of Nov.12 class and using domain analysis, 2) identify all possible included terms that related to student experiences of learning in this class, 3) grouping the included terms semantically into domains, and 4) examining relationships among domains to develop a taxonomy that represented various aspects of student experiences.

Findings: Learning qualitative research methodologies is more complex, time consuming, and difficult than students anticipated; but it was a rewarding experience. Students found interviewing the participants (their Ph.D. colleagues) to be inspiring, enlightening, and comforting. It was difficult to schedule face-to-face time with their partners to collaborate on their projects. But when students were able to collaborate with their partners, it enhanced their learning experience. Students became aware of their own strengths and weaknesses as researchers and students, including the need to better manage their time and to focus better through sustained periods of uninterrupted concentration.

Recommendations: Consider ways to increase students' collaboration time with partners, perhaps through dedicating more in-class time for this activity. Dedicate a whole class to "dissect" an exemplary qualitative research project (if there is such a thing). This would help demystify the process and give students a basic understanding of the process they will be following for their projects. Encourage students to continuously connect their most recent learnings, struggles, etc. back to their research question to ensure they do not lose sight of the critical questions that are driving their projects.

**Polymorphisms Associated with the Risk of Neonatal Parenteral
Nutrition Associated Cholestasis (PNAC)**

Renee Bellanger, Pharm.D., & Helen E. Smith, Ph.D.

A case control study evaluated potential genomic biomarkers for identifying infant risk of parenteral nutrition associated cholestasis (PNAC). The following genetic variants were evaluated: C3435T and G2677A/T of *ABCB1* (efflux transporter); C475T, G2662T, and C959T of *ABCB4* (lipid flippase); and A1772G, G1674C, G2944A, and C3457T of *ABCB11* (bile acid transporter). *The hypothesis of this proposal: the above genetic variants are associated with an increased risk of neonates developing PNAC.* PNAC manifests as impaired secretion of bile or biliary obstruction caused by impaired or altered transport of lipids or bile across hepatocyte canalicular membranes. The following specific aims were addressed: 1.) Determine the genotypes of neonates requiring parenteral nutrition (PN) at the above loci of *ABCB1*, *ABCB4*, and *ABCB11*. 2.) Evaluate the association between these genetic variants and the risk of developing PNAC by calculating odds ratios.

Infants requiring PN may develop PNAC at a prevalence of 30%-70% (Rangel, Calkins et al. 2012). Patient factors and the PN nutrient composition have been evaluated as risk factors, but these do not appear to be the cause of neonatal PNAC. The underlying mechanism of PNAC is unknown. Pharmacogenomic investigations have explained many adverse responses to medications and pharmacogenomic biomarkers are used to prevent many adverse responses by identifying patients at risk.

Neonates were recruited from the Children's Hospital of San Antonio NICU. Genomic DNA was obtained by buccal swab from consented subjects and isolated using Qiagen's QIAmp DNA Mini Kit Spin Protocol. Isolated genomic DNA was sent UTHSCSA's Nucleic Acids Core for PCR amplification and high throughput sequencing. Pertinent clinical data was abstracted from subjects' medical records. Cases were defined as neonates with at least two consecutive direct bilirubin levels $\geq 2\mu\text{g/dL}$ and had received PN for at least 7 consecutive days without significant enteral feedings. The relative risk of developing PNAC in the presence of each genotype was calculated as an odds ratio.

An OR of 1 indicates no association between the variant and PNAC. An OR > 1 indicates a positive association between the variant and PNAC, suggesting the variant contributes to the risk of PNAC. An OR < 1 indicates a negative association, or possible protective effect, of the variant on the risk of PNAC. Confidence intervals calculated using the Taylor series expansion determine the statistical significance of the calculated ORs. Potential confounders will be assessed for their influence on the ORs.

Twenty-two infants were consented; nineteen were eligible as subjects. All genotyping assays were successful. A significant odds ratio (OR=1.25 (CI 0.09:17.98, n=17)) was identified at loci 53 of *ABCB4*, an unexpected variant. This OR indicates that in this study population, this variant is significantly associated with the risk of developing PNAC. The other variants of interest were not found to be significantly associated with the risk of developing PNAC. Further analysis will be conducted to evaluate confounders. The investigators hope to conduct future studies using more subjects to validate these results.

Comparison of performance of two pharmacy resident cohorts' on an objective structured clinical examination

Kimberly A.B. Cauthon, Pharm.D., CGP, Elizabeth M. Urteaga, Pharm.D., Rebecca L. Attridge, Pharm.D., MS, SCPS, Amy P. Witte, Pharm.D.

The purpose of this study was to evaluate pharmacy residents' ability to communicate, apply knowledge and use their clinical skills in simulations of commonly encountered patient scenarios using an OSCE.

The Objective Structured Clinical Examination (OSCE) is a frequently used and effective assessment for evaluating the clinical and communication skills of medical residents and health-care professions students. An OSCE consists of multiple, simulated, realistic patient encounters where various clinical tasks are performed by examinees. Use of the OSCE may serve as a novel way to provide an additional assessment of pharmacy resident competence and performance. Currently, residents' attainment of competence is mostly based on preceptor evaluation of the resident's performance on educational outcomes, objectives and goals.

Post-graduate year 1 (PGY1) and post-graduate year 2 (PGY2) pharmacy residents completing local residency programs were invited to participate in one OSCE in the spring of 2014 and one OSCE in the spring of 2015. The study was approved by the institutional review board and study participation was voluntary. Both OSCEs were developed by an OSCE task force consisting of four school of pharmacy faculty members. The OSCE stations were developed to assess selected American Society of Health-System Pharmacists (ASHP) residency program goals. Station design included outpatient and inpatient settings with patient and physician interactions. Resident performance was evaluated by a clinical skills checklist and a communication checklist. Residents completed a four or five station OSCE in 2014 and a five station OSCE in 2015. Standardized patients were trained by the OSCE task force and completed the clinical skills and communication checklists. Median communication and clinical skills scores were evaluated with competency considered to be 70% or greater on each of the ASHP goals. Performance on the inpatient and outpatient OSCE stations were also compared.

A total of twenty-one residents from four pharmacy residency programs completed an OSCE. Eight PGY1 residents and one PGY2 resident completed the OSCE in 2014 and eleven PGY1 and one PGY2 resident completed the OSCE in 2015. All PGY1 and PGY2 residents from both years scored well and showed competence on the communication checklist. The residents' median OSCE clinical skills score of 87.5%, with a range of 80.9% to 100%, in 2014 demonstrated competence. In 2015, the median clinical skills score of 60.50%, with a range of 58.78% to 69.31%, did not meet competence. Depending on the ASHP goal, scores ranged from 43.34% (ASHP goal 2.5: make and follow up on patient referrals) to 100% (ASHP goal 2.8: recommend or communicate regimens and monitoring plans). Clinical skills scores were also assessed by case type and there was not a significant difference in performance among the inpatient case and outpatient cases for either year. The OSCE was successfully implemented for residents from multiple programs and provided an additional objective assessment for the residents and residency programs. The results of the OSCE will lead to improvement in future OSCEs and potentially lead to improvement in postgraduate training. Implementation of an OSCE may be an effective tool for assessment of the ASHP PGY1 Pharmacy Practice Residency Standards, Goals and Objectives.

cFos changes in the hindbrain following central microinjection of nociceptin/orphanin FQ in conscious hypertensive rats

Caroline Conner, Bethannie Drzymala, Ligil Koshy, Pharmacy Students, Lourdes Fortepiani, Associate Professor, Cynthia Franklin, Research Associate, Helmut Gottlieb, Associate Professor

The purpose of the present study is to examine changes in cFos immunohistochemistry evoked by Intracerebroventricular (ICV) administration of opioid like peptide receptor agonist, nociceptin/Orphanin (N/OFQ), into an *in vivo* hypertension model, angiotensin II/High salt diet (ANGII).

Central nociceptin administration produces marked decreases in blood pressure, heart rate, and renal sympathetic nerve activity. These changes in cardiovascular (CV) and renal function are exacerbated in ANGI rats, which suggests that the N/OFQ system may be up-regulated under this hypertension model. However, the central nervous system (CNS) sites involved in these responses are yet to be determined. The hindbrain contains a number of regions involved in the modulation of CV and sympathetic activity. Immunodetection of cFos, a member of the AP-1 family of transcription regulatory proteins, has been widely used as an indicator of neural activation. As such, we used cFos to determine the changes in neuronal activity in the hindbrain of ANGI rats treated with N/OFQ as compared to ANGI rats injected with isotonic saline (control group). By examining the changes in cFos, we can determine which brain region is being modulated by N/OFQ.

Male Sprague-Dawley rats were instrumented with osmotic mini-pumps filled with angiotensin II for subcutaneous (s.c.) infusion. In addition, rats were implanted with an ICV cannula for delivery of drugs into the lateral cerebral ventricle. After recovering, rats were fed 2% high salt diet for 14 days and at day 15, injected with either N/OFQ or saline. After ninety minutes, which corresponds to the cFos expression peak, each rat was anesthetized with Inactin (100 mg/kg i.p.) and perfused with PBS and fixative [4% paraformaldehyde⁽⁷²⁾ in phosphate buffered saline, PBS, pH =7.4]. Next, the brains were removed and processed for cFos immunocytochemistry using a commercially available antibody (Oncogene AB-5). Brain sections were examined using light microscopy to identify cFos positive cells.

ICV N/OFQ produced significant decrease in c-Fos staining in the area postrema (C, 100.1 ± 26 , ANGI; 69 ± 21 P<.001) and anterior nucleus of the solitary tract (NTS) (C, 44 ± 14 ; ANGI 27 ± 10 ; P < .01). There were no statistical significant changes to the rostral ventrolateral medulla (RVLM), medium NTS, or locus coeruleus. The area postrema and NTS have been shown to be involved in the control of blood pressure. Central N/OFQ receptor inhibition of these hindbrain regions (area postrema and NTS) may form part of the neuropathways involved in the decreases in blood pressure evoked by N/OFQ.

Effect of Glucose, Sodium Chloride, and Ascorbic Acid Concentrations on Glycation and Aggregation of Bovine Serum Albumin

Peirung Huang, B.S., Cynthia Franklin, M.S., Adeola O. Coker, Ph.D.

The purpose of this project was to assess the effect of ascorbic acid and sodium chloride on serum albumin glycation, with d-glucose as the glycating agent.

Protein glycation is a chemical process that is caused by the binding of reducing sugars to proteins. It leads to a myriad of diabetic complications such as vascular stiffness, atherosclerotic plaques, nephropathy, and retinopathy. Inhibiting the chemical reaction between reducing sugars and proteins *in vivo* is a potential therapy for reducing diabetic complications. The initial reaction between reducing sugars and proteins, known as the Maillard reaction, proceeds to form advanced glycation end products (AGEs). Oxidation and aggregation reactions are implicated in AGEs. Ascorbic acid is an anti-oxidant shown in literature to inhibit glycation in samples degassed with nitrogen. Ionic strength (salt concentration) is one of the major factors that affect protein physical and chemical reactions. Thus the effect of ascorbic acid and sodium chloride (NaCl) on glycation was investigated in a multivariate experimental design to assess the effect of combinations of the two nutrients on glycation. By identifying combinations of nutrients that inhibit glycation, one can modify patients' diet to help improve the symptoms.

A central composite design consisting of 0 to 300 mM d-glucose (dextrose), 0 to 10 mM ascorbic acid, and 0 to 300 mM NaCl was used in the study. Ten mg/ml bovine serum albumin (BSA) samples in the different formulations were prepared under atmospheric conditions (to simulate real-life scenarios) and incubated for 38 days at 50°C and over 9 months at 37°C. Samples were measured using ultraviolet and fluorescence spectroscopy to monitor the glyco-oxidation process. SDS-PAGE and size-exclusion chromatography (SEC) were used to monitor aggregation of BSA. The experimental design was created, data analyzed, and statistically significant factors identified using JMP software.

As expected, higher levels of dextrose, resulted in increased UV absorption and fluorescence, indicative of increased glycation. Similar results were also observed with higher levels of ascorbic acid even in the absence of dextrose, indicating that ascorbic acid glycated the protein. SEC showed increased aggregation at higher levels of dextrose, ascorbic acid, and NaCl. Although ascorbic acid is an anti-oxidant, it is also a reducing sugar that readily decomposes in the presence of oxygen to form products that glycate proteins. A competitive interaction was observed between ascorbic acid and dextrose, such that the effect of dextrose on aggregation was less pronounced at high ascorbic acid concentration. A marginally significant interaction was observed between NaCl and dextrose, such that the effect of dextrose on aggregation was more pronounced at high NaCl concentrations. The SEC retention times of BSA glycated with dextrose was lower than that of BSA glycated with ascorbic acid, suggesting different glycated products are formed by the two sugars. The results showed that the high levels of ascorbic acid assessed in this study, in the presence of oxygen, promotes the glyco-oxidation-aggregation process. The results of this study are important in understanding factors contributing to protein glycation and aggregation; and identifying dietary interventions that will help diabetic patients.

***Arylated hydrazones, quick synthesis plus partial characterization:
Elaborating small libraries of potential plural-factorial drug molecules***

Malik Khan, B.Sc., William Horton, Graduate Student, Marianna Torok, Ph.D., Donald Sikazwe, Ph.D.

The aim of this study was to synthesize and partially characterize hydrazone functionalized molecules analytically and via antioxidant assays. *It was hypothesized that* molecules acting against two or more contributory factors (oxidative stress included) to neurodegeneration can be disease modifying.

Neurodegenerative diseases like Alzheimer's possess mixed or multi-pharmacological profiles. We opine that such diseases can be managed most effectively by single molecule pharmacotherapeutic agents, like arylated hydrazones, endowed with plural-factorial activities.

The 2015 Alzheimer's US landscape of about 5 million patients is projected to triple to 16 million by 2050, and yet the current pharmacotherapy is only palliative at best. The above numbers illustrate a compelling need to develop novel disease modifying molecules against this progressive neurodegenerative disorder. Hydrazones exhibit multi-pharmacological activities, and therefore hold the promise of being disease modifying.

A simple *two-step* synthetic procedure was employed to arrive at the desired target hydrazones:

- 1) Hydrazides: A suspension of ester and excess hydrazine starting materials in absolute EtOH was refluxed. Solids that formed were filtered, rinsed with water then ethanol, and dried to afford the intermediate hydrazides in > 60% yields.
- 2) Hydrazones: Parallel synthesis was utilized to obtain several hydrazone targets. An acid catalyzed reaction mixture of the hydrazide, obtained in step one, and a variety of aldehydes was stirred at room temperature. Within 30 minutes, the target compounds precipitated out, were washed with H₂O then EtOH, and dried under vacuo with heat. Product yields ranged from 60% to quantitative.

¹H NMR (300 MHz in DMSO-d₆) and Melting Point (MPs, MeltTemp) experiments were conducted as part of the hydrazide/hydrazone compound characterizations. Using parallel synthesis techniques, we have generated and partially characterized (¹H NMR, FW, MP) a set of *hydrazone* small molecules. A two-step "*time and resource saving*" synthesis has been deployed to rapidly generate a small library of hydrazones and related molecules for biological screening. The synthesized molecules will be evaluated for plural-factorial or multi-target activities in biological assays, for instance, partial antioxidant activities are reported. We seek to develop and screen hydrazones because state of the art drug discovery efforts increasingly indicate that multi-target molecules can more effectively address multi-factorial diseases – indeed, Alzheimer's disease is multifactorial in nature, also it is a neurodegenerative disorder.

Comparison of Intrinsic and Extrinsic Fluorescence in Predicting the Effect of pH and Excipients on Real-Time Stability of BSA

Zakiya K. Powell, B.S., Joel D. Manrique, B.S., Ryan M. Brock, Pharm.D., Cynthia Franklin, M.S., Adeola D. Coker, Ph.D.

The purpose of this study is to compare the predictive qualities of intrinsic and extrinsic fluorescence in identifying significant excipients important to Bovine Serum Albumin (BSA) stability on storage.

Fluorescence spectroscopy is a pre-formulation tool used to examine the effect of pH and excipients (additives) on protein conformation and identify additives that may affect stability on storage. One approach is to determine the mid-point of thermal transitions (T_m) when the protein is heated. The thermal transition can be monitored via the intrinsic fluorescence of the protein or extrinsic fluorescence of a dye that binds to the protein. The fluorescent properties of certain dyes vary with the polarity of the environment the dye is in, and thus can be used to monitor protein unfolding (as the dye binds to exposed hydrophobic surfaces). However, additives can bind to the dye or can prevent the dye from binding to the protein and make data interpretation difficult. This study compares results from intrinsic and extrinsic fluorescence experiments that assessed the effect of additives on the conformation of a model protein BSA. The fluorescence data were then compared with long-term stability data to evaluate the effectiveness of intrinsic and extrinsic fluorescence in predicting protein stability on long-term storage. The results illustrate the importance of considering intermolecular interactions in interpreting extrinsic fluorescence data.

A central composite multivariate experimental design was used to assess the effect of pH and four commonly used protein additives (sodium chloride (NaCl), methionine, sucrose, and polysorbate-80), on BSA stability. Samples were analyzed via intrinsic fluorescence and extrinsic fluorescence of the dye, Bis-ANS. Since bis-ANS binds to polysorbate-80, this excipient was excluded from samples analyzed via extrinsic fluorescence. Fluorescence parameters assessed included initial intensity ratio and mid-point of the thermal transition (monitored by intensity ratio as a function of temperature). Real time (4°C) stability of the samples was assessed after approximately 3 years using size exclusion chromatography (SEC). The results were analyzed using JMP software to identify excipients and excipient interactions that affected the protein stability. Fluorescence data was compared with 4°C stability data to assess the ability of the fluorescence data to predict stability of the protein on storage.

Several correlations were observed between excipients that had a statistically significant effect on the thermal transitions of BSA monitored via intrinsic fluorescence and the stability of BSA on storage at 4°C. These included pH, polysorbate-80, and pH-NaCl interaction. Complex thermal transitions were observed via extrinsic fluorescence, making data interpretation difficult. The thermal transitions observed via extrinsic fluorescence typically began at a higher temperature compared to the corresponding intrinsic fluorescence thermal transitions, suggesting that the binding of the dye to BSA stabilizes the protein against thermal unfolding. In this study, intrinsic fluorescence was a better predictor of stability on storage compared to extrinsic fluorescence. Additional studies using circular dichroism are ongoing to further characterize the effect of Bis-ANS on BSA conformation and help to interpret extrinsic fluorescence data.

Assessment of pharmacy student performance on an objective structured clinical examination and an annual assessment exam

Elizabeth M. Urteaga, Pharm.D., Rebecca L. Attridge, Pharm.D., MS, BSPS, Kimberly A.B. Cauthon, Pharm.D., CGP, Amy P. Witte, Pharm.D.

An objective structured clinical examination (OSCE) was used to evaluate how effectively pharmacy students' communicate and apply knowledge to simulations of commonly encountered patient scenarios. The results of the OSCE were compared to overall and individual performance on an annual student assessment exam. The progression of performance of second- to third-year and third- to fourth-year pharmacy students was also evaluated.

The use of OSCEs as assessment tools in pharmacy programs is new so the data are not as robust. In 2010, 32 out of 108 US Colleges of Schools of Pharmacy reported using OSCEs. Our study will provide educational outcomes data that will be used to improve individual student and overall program performance. By tracking OSCE scores over time, we will have an objective measurement of student and program improvement.

Second-, third-, and fourth- year pharmacy students completed an OSCE as part of their required courses in 2012, 2013, and 2014. Each OSCE station was designed to assess specific curricular outcomes. Third-year pharmacy students were also assessed using an internal, annual, case-based, multiple-choice exam designed to assess curricular outcomes. Pearson's correlation was used to determine correlation between the OSCE and annual case-based exam.

In 2014, 261 pharmacy students completed the OSCE and consented to the study. The median communication and clinical scores out of a score of 100 ranged from 95.8-98.4 and 58.7-78.7, respectively. The second-year students' median scores were higher than the third- and fourth-year students. Progression data revealed an improvement in performance for both the second- to third-year pharmacy students ($p < 0.0001$) and third- to fourth-year pharmacy students ($p = 0.005$). The third-year OSCE clinical skills scores correlated with the third-year annual student assessment exam (0.3228; $p = 0.002$). OSCEs can evaluate clinical skills and communication skills among professional students. Implementation of OSCEs can be an effective tool for assessment of curricular outcomes and the CAPE domains.

Using Multiple Logistic Regression to Model the Probability of Passing the NAPLEX

Alejandra Zertuche, M.B.A., Renato Leduc, Student, David Maize, R.Ph, Ph.D.

The objective of this study was to find academic performance patterns of former students to predict future students' probability of passing NAPLEX.

On January 2014, the Feik School of Pharmacy (FSOP) received identified student North American Pharmacist Licensure Examination (NAPLEX) results from 94 graduates who reported graduating from FSOP in May of 2014 and took the NAPLEX on the testing window of May to December of the same year. These graduates consented for the FSOP to obtain their scores from the National Association of Boards of Pharmacy (NABP) to use the data with the purpose of providing individualized support to those prospective graduates with a low probability of passing the NAPLEX.

FSOP received the NAPLEX scores from 94 graduates from the class of 2014. The NAPLEX dataset consists of the total, area 1, area 2, area 3 scaled scores, and whether or not the graduate passed the NAPLEX (*NAPLEX performance*: PASS or FAIL). The NAPLEX dataset was compiled with twelve qualitative variables in order to study the relationship between *NAPLEX performance* and academic performance patterns. The twelve qualitative variables were: P1, P2, P3, and cumulative GPAs, capstone grades, P1-P3 year-end (ASAP) exam scores, APPE GPA, Pharmacotherapeutics (PT) GPA, Anatomy and Physiology (A&P) GPA, and Pharmaceutics (Ceutics) GPA.

The relationship between *NAPLEX performance* and the twelve variables was modeled using multiple logistic regression instead of multiple linear regression because it performs better at representing a range of probabilities for a categorical dependent variable like the *NAPLEX performance*.¹ The R package, glmulti, was utilized to automate the model selection through R functions that fit generalized linear models.² The glmulti package produced unique models and the model with the smallest Bayesian Information Criterion (BIC) statistic was selected as the best model to predict the probability of *NAPLEX performance* = PASS.¹ After the model was selected, a ten-fold cross-validation method was performed to estimate the accuracy rate of the model.¹ The dataset was divided into 10 subsets of 10 graduates and 9 subsets were used to train the model and estimate the regression coefficients, and the one remaining subset was used to test the model. This process was repeated 10 times, and the accuracy of the model was determined by calculating the mean accuracy rate. The maximum likelihood method estimated the regression coefficients of the selected model.¹ These estimated coefficients calculate the probability of PASS. The predicted probabilities were converted into two categories: PASS if the probability of PASS was greater than or equal to 0.75 and FAIL if the probability of PASS was less than 0.75. A confusion matrix was created to determine how many graduates were correctly classified as PASS or FAIL.

The glmulti package generated 4,250 unique models and selected the best 50 models by using BIC which tends to be small for models with low error rates.¹ The model with the smallest BIC was selected as the best model to predict *NAPLEX performance* = PASS. A Confusion matrix was performed for each of the 10 iterations to compare the *NAPLEX performance* predictions to the true *NAPLEX performance*. The Multiple Logistic Regression Model made correct predictions for 84 of the 94 graduates resulting in a model accuracy of .894.

Factors That Affect Tablet PC Adoption Among College Students

Thomas A. Dotter, MBA, Vess Johnson, Ph.D.

The purpose of this study is to identify the factors that affect tablet PC adoption by currently enrolled college students.

This study may assist educators and higher education administrators to evaluate the value of tablet PC technology in the classroom, in the lesson plans, and in campus technology requirements. University faculty may also base outcomes of this study, consider ways that allow students to interact with them using the tablet PC platform, and incorporate the tablet PC into their courses. Finally, future researchers may want to explore what web based applications can effectively operate on the tablet PC platform. The result from this type of research will enable universities to leverage the mobility tablet PC's can offer students and faculty and provide a tailored PC platform experience.

The overall approach is quantitative, which is “appropriate when the investigator identifies a research problem based on trends in the field. Describing a trend means that the research problem can be answered best by a study in which the researcher seeks to establish the overall tendency of responses from individuals and to not how this tendency varies among people” (Creswell, 2011). Specifically, the purpose of this study is to identify the factors that affect tablet PC adoption by currently enrolled college students.

Research question and Hypothesis statements: What factors affect the adoption of tablet PC technology? H1: Perceived financial cost affects adoption of tablet PC technology. H2: Relative advantage affects adoption of tablet PC technology. H3: Ease of use affects adoption of tablet PC technology. H4: Image affects adoption of tablet PC technology. H5: Compatability affects adoption of tablet PC technology. H6: Trialability affects adoption of tablet PC technology.

Participants include undergraduate and graduate students enrolled in ten different locations. The students were contacted via a professional academic network of colleagues.

The main variables of the model (Relative Advantage, Ease of Use, Image, Trialability, Compatability, Perceived Financial Cost) measured with previously validates scales (Moore & Benbasat, 1991). Each of the items was constructed using a Likert scale with five response categories. Cronbach's Alpha was used to ensure satisfactory levels of internal consistency of the scale items. Questions with sufficient level of reliability from previous research were selected.

Descriptive statistics, such as frequency of response, were used to determine aggregate respondents' age, gender, ethnicity, and grade level utilized in this study. In addition, a response rate of at least 50% is considered adequate (Babbie, 1973).

Data was analyzed using the SmartPLS software package (Ringle et al., 2005). PLS was used due to its appropriateness in studies in the exploratory stage such as the one described in this study. Consistent with prior research, analysis proceeded to utilize a two-step process (Anderson and Gerbing, 1988; Hair et al., 2009).

**Combating Discrimination or Playing the Game: Factors Affecting Hiring Decisions
For A Diverse Workforce**

David A. Harrison, Ph.D., Ryan M. Vogel, Ph.D., Teresa L. Harrison, Ph.D., Michael E. Brown, Ph.D.

Despite hiring managers being taught to focus only on job-relevant features (Pager & Karafin, 2009), investigations have shown that broad stereotypes about women and racial minorities are a demonstrable part of evaluative prejudices (Nelson, Acker, & Manis, 1996). We examined two forms of human capital that might reduce biases: military training and NCAA sports participation. Regardless of their pervasiveness, particularly in college populations, neither of these variables appears to have been studied jointly with gender and race in applied research.

Military training reinforces leadership, team values, rules, and culture of the dominant gender and racial group. This signifies they have missing “intangibles” part of negative gender and race stereotypes. Therefore:

Hypotheses 1a-b. Military training will (a) have a positive effect on hiring evaluations, (b) especially (as an interactive effect) for women and racial minorities.

Similar arguments are features of U.S. NCAA athletes. Participation can be beneficial to disadvantaged or discriminated groups. However, minorities may be viewed as naturally athletic and less effortful in other areas, increasing prejudices. Therefore:

Hypotheses 2a-b. [NCAA] athletics participation will (a) have a negative effect on hiring evaluations, (b) especially (as an interactive effect) for women and racial minorities.

One stage receiving intense research attention is résumé evaluation in response to a job posting. Using identical qualifications, investigators have tracked call-backs and eventual job offers in which racial or gender-typed names were randomly assigned (e.g., Steinpreis, Anders, & Ritzke, 1999). Evidence of discrimination is disturbingly strong. Average rates of hiring matriculation are 20-300% greater for the faux male or dominant racial group member (for any occupation; Pager, 2007), estimated to account for earnings disparity between groups (Tomaskovic-Devey, Thomas, & Johnson, 2005).

We began inductively, interviewing athletes, cadets and veterans, confirming anecdotal evidence supporting the contentions above. Our ongoing experimental studies involve a within-evaluators policy capturing design (Priem & Harrison, 1994). The sample consisted of 63 employed MBAs with an average age of 28.30 years (60% males, 40% females). Forty-seven percent were Anglo Americans, 3% were African Americans, 44% were Hispanics, and 6% were Asian/Pacific-Islanders. Variables were manipulated and ordered randomly across a packet of résumés rated by each evaluator. Measures included merit for hire, ranking, and salary assignment.

Hypothesis 1a was not supported. Military training had a negative effect on merit for hire but positive effect for pay ($p < .05$). Hypothesis 1b was partially supported; race \times military training had a negative effect for hiring merit ($p < .05$) and pay ($p < .10$), but a positive effect for gender \times military training, and pay ($p < .10$). Collegiate sports was evaluated negatively for hiring merit ($p < .01$) and overall ranking ($p < .01$), supporting Hypothesis 2a. Contrary to Hypothesis 2b, effects were more negative for African Americans but not women.

Junior professionals may think military training and NCAA participation are not helpful even compared to irrelevant experience. It is especially adverse for African Americans. Future research should continue to focus on factors that may help historically discriminated groups level the playing field.

Results of the 2015 Society of Information Management IT Trend Study

Vess L. Johnson, Ph.D., Assistant Professor, Leon Kappelman, Professor, Ephraim McLean, Professor, Russell Torres, Assistant Professor

In 1980 the Society for Information Management (SIM) began a collaboration with IT scholars to solicit input from its members about the most important IT management issues. The study collects information such as IT spending levels and hiring, technology issues facing the organization, primary investment areas, outsourcing, cloud and shared services, and skills.

Over the years, the SIM IT Trends Study expanded to become one of the most insightful and comprehensive investigations of the state of IT and IT leadership in organizations. An important contribution of this multi-year research effort is its ability to identify important trends across the industry and the IT profession. This year marks the 36th anniversary of this valuable SIM program.

A survey was developed using a 3 phase Delphi method with the final instrument distributed to over 5000 IT professionals. One thousand two hundred and eighteen individual SIM members, including 486 CIOs, representing 785 unique organizations responded. The collected data was analyzed to identify trends ranging over the past 36 years.

Some of the key findings and conclusion include:

- * The average annual revenue of the responding organizations is \$6.23 billion, the median is \$500 million, and their total revenues are nearly \$5 trillion. On average, their IT spending is 5.3% of gross revenues.
- * Alignment of IT with the business and security/privacy continue to be the number 1 and 2 issues facing organizations and IT management.
- * The highest spending is occurring in areas related to big data analytics. However, security expenditures rose significantly (#7 in 2014 to #3 in 2015).
- * IT budgets continue to increase as a percentage of revenue. This upward trend began in 2011 and has continued through 2015.
- * Expenditures related to cloud computing is down – largely due to dropping prices. However, 98% of organizations do report some level of private/public cloud usage.

Overall, the study finds IT leadership is becoming more pragmatic, holistic, strategic, and business-focused, while also working to optimize IT operations and services, with priorities like agility, innovation, time to market, security, and the strategic value of IT to the business.

Transfer Pricing Comparison of Oil and Gas Companies to Pharmaceuticals

April R. Poe, Ph.D., MPA, CPA

Studying two industries at opposing ends of the uncertainty spectrum for transfer pricing (oil prices are publicly published, but pharmaceuticals have unique products and great flexibility in pricing) with the expectation that companies with more flexibility in establishing transfer pricing benefit from a lower worldwide effective tax rate. Transfer pricing is the internal price a multinational enterprise charges itself (through its subsidiaries) as it moves goods and services across borders. Companies with more ambiguous pricing for products (not publicly posted like oil prices) may move income to different countries to gain an income tax advantage which harms tax collections in higher taxing countries. This is a governmental policy and international relations issue.

A Multinational Enterprise can improve its cash flow and after tax income by beneficial transfer pricing choices that do not affect other metrics important to investors like revenue and gross margin. However, manipulation of internal pricing is expected to be more successful for companies with more of their value derived from unique intangibles (pharmaceuticals) than for those with more of their value in hard assets (oil and gas). This is important as countries lose tax revenues when transfer prices are manipulated.

The sample is firm-year observations with the needed variables for the oil and gas and pharmaceutical industries available on the COMPUSTAT financial database for 2000-2010, resulting in 787 total observations. Only pharmaceutical and oil and gas firms that are incorporated in the United States are included to limit the sample to firms that are more likely to have similar tax planning objectives. I use a truncated regression on a model with the worldwide effective tax rate WWETRVAR as the dependent variable and important independent variables include a measure of foreign operations (ability to engage in transfer pricing), intangible assets, and other financial/tax measures.

Due to the public nature of the pricing for oil and gas products, they do not have the same ability to manipulate transfer pricing as companies with less obvious comparable sales prices. The results for Pharmaceuticals, with their high-value, unique intangibles (drug patents) are consistent with those firms having a wider range of choices in setting beneficial transfer pricing (taking advantage of unique assets with no 3rd party comparable sales). Companies benefit by saving taxes while countries are harmed by losing tax revenues. Corporations with aggressive transfer pricing gain an unfair advantage in the market place. My results support that pharmaceuticals manipulate transfer pricing to a greater extent than oil and gas firms. Governments need to be aware that different industries have different abilities to manipulate internal pricing, target audit, and policies accordingly.

Quantitative Study of Predictors of Project Management Success

William K. Pugh, MS, MBA, PMP

The purpose of this study is to identify predictors of project management success through quantitative analysis of intrinsic empirical project data.

The framework used in evaluating the predictors of project management success was the Logical Framework Model (LFM) that includes levels for goal, objective, output and input for a project. This model links internal considerations (project management success) to project outputs, which subsequently carry forward to satisfy a stated objective in order to achieve a long-term organizational goal. Project management success was evaluated on meeting the *triple constraint* criteria of schedule, budget and scope. The significance of this research may provide the ability to predict project management success by manipulating the inherent project variables associated with the triple constraint, as well as the other intrinsic project attributes, in order to better align organizational project delivery functions.

Project management success was measured by a quantitative analysis of empirical project data through multivariate regression analysis of over 1000 software development projects. The project attributes (predictors) were portfolio, program, methodology, schedule size and budget size. Analysis was conducted to understand the relationship between the predictors and outcome, as measured by meeting the *triple constraint* criteria of schedule, budget and scope. Project data spanning a three-year period was collected from an internal project management database for 1084 information technology (IT) projects within a Fortune 200 financial services company in the Southwest United States. Data extraction and merging individual datasets was required to analyze the constructs under investigation. After initial review, 29 projects were excluded from the study due to incomplete data. The information extracted from the project management database contained the five predictors under investigation (portfolio, program, methodology, schedule size & budget size) and individual project management success was determined by meeting the planned budget and planned schedule. Evaluation of each project in meeting planned scope was determined by the number of change requests for each effort.

In this study, a quantitative analysis was conducted to determine predictors of project management success based on intrinsic project attributes. The results show that projects within the non-discretionary portfolio performed better overall in terms of meeting planned budget and projects executed using agile methodology generally performed better in terms of meeting planned schedule. In addition, projects that are estimated larger in terms of schedule significantly perform worse in meeting planned schedule and budget and projects that are estimated larger in terms of budget have significant cost overruns at the end. The implications for project management practitioners indicate an advantage in using agile development when faced with schedule constraints and they should consider reducing project size in terms of schedule and budget to a minimum value that will also fulfill the stated objective. The findings of this research support previous researchers who found direct relationships between project management success and intrinsic project attributes.

EXPERNOMICS vs. LECTURE: A META Analysis from Journal of Economic Education (1969 to 2015)

Dr. Nürşen A. Zanca

The objective of this paper is to provide empirical evidence on the relative effectiveness of expernomics against traditional lecture style teaching in economics. My objective here is to capture whether there is any systematic evidence for lecture-less experiments in economics teaching. The primary goal of this study is to determine to what degree lecture-less experiments contribute to the learning of economics captured by test score performance.

An important issue in economics education is that the predominant method of teaching style is “chalk-and-talk” or “one-way talk” traditional lecture method. Economists have studied a broad range of “lecture-less” pedagogical practices. Many attempts have been made to measure the impact of “classroom economic experiments” on the learning of economics. Although it is claimed that “lecture-less” teaching facilitates “active learning,” however, the empirical evidence on whether it improves student learning is mixed. In this current paper, I have scrutinized the available empirical evidence with a view to establishing some general conclusions on the subject.

It is well acknowledged that it is not proper to recommend an intervention or a treatment based on a single study. Instead, it is advisable to examine the cumulative effect of numerous studies. How do we learn about the cumulative effects? The primary goal of META analysis is accumulating knowledge. The scope of this study is restricted to literature review from the JEE between 1969 through 2015. Specifically, three criteria determined for inclusion in the META analysis: First, the study examined undergraduate economics education, and incorporated a form of “lecture-less” style teaching. Second, the study was conducted in an actual classroom with randomized controlled trials. Third, the research reported enough statistical information in order to estimate effect sizes. In this review, a total of 47 journal articles were obtained. Out of 47 journal articles, 35 were found to contain no usable data, a total of 12 studies were included in the META analysis.

Computation of Effect Sizes:

$$\hat{\Delta} = (\bar{X}_E - \bar{X}_C) / S_p$$

$$S_p^2 = [(n_E - 1)S_E^2 + (n_C - 1)S_C^2] / (n_E + n_C - 2)$$

where n_E and n_C are the sample sizes; \bar{X}_E and \bar{X}_C are the mean values; and S_E and S_C are the associated standard deviation, for experimental and control groups, respectively.

There are three conclusions that can be drawn: *Firstly*, the current paper provides cumulative evidence on the impact of lecture-less pedagogy in economics. If science is accumulation of knowledge, this accumulation can be facilitated by use of META analysis. The META analysis demonstrates that the average effect size in comparing lecture-less (experiment group) vs. traditional lecture (control group) instruction is less than 0.2 (small effect). In other words, the META analysis indicates that “lecture-less” pedagogy does not have a significant difference in student learning over traditional old-and-boring lecture style. *Secondly*, the current paper has re-examined the available literature concerning lecture-less experiments and found that some earlier conclusions did not hold. *Thirdly*, the results of the META analysis imply a potentially useful recommendation for economics education. Perhaps the most important finding is the relation between the choice of teaching method and the learning of economics. The results provide some support for classroom experiments being *an effective teaching tool*, however, not necessarily *an effective learning method*. The author of this paper hopes that the paper has created an appetite to the reader to learn more about lecture-less experiments.

Fall Stratification Program: Determining Barriers to Success of the Program

Melissa H. Alonzo, BSN-RN, Rafia Banu, BSN-RN, Michelle L. Stone, BSN-RN

The purpose of the study is to identify evidence based interventions to prevent falls in the hospital in an acute care setting.

Falls in the acute care setting may lead to decreased quality of life and increased complications depending upon the severity of the fall. A goal of Healthy People 2020 is to “improve health-related quality of life and well-being for all individuals” (US Department of Health and Human Services, 2015). Serious bodily injury can result from falls during hospitalization. It is the responsibility of healthcare providers to protect their patients from harm and to keep their patients safe. Prevention of falls is a significant issue for the particular floor being studied. This floor experiences more than three falls per month which is higher than any other floor in the facility. This rate is also higher than the national average for this type of unit in similar hospitals across the nation.

This is a descriptive study and quality improvement project. A full microsystem assessment will be completed using the Dartmouth Model and Five P Assessment methods. This process improvement project will take place within the intermediate telemetry unit with thirty-nine beds at a local hospital in South Texas. It includes retrospective chart reviews that contain fall risk stratification documentation, observations within the unit, and surveys of staff and health care providers. Common factors will be noted. The surveys will help identify discrepancies in policy adherence and barriers to its proper and consistent delivery. Implementation of the policy will be observed for consistency. Any variances and voiced concerns will be discussed with the staff and unit administration to further identify factors in the increased fall rate. Contributing factors will be used to recommend an intervention and budget plan to reduce the fall rate within the unit.

Interventions will be aimed at increasing compliance with current fall stratification program, and will focus on staff education and understanding of benchmarks. Team building strategies and leveraging the free charge nurse will be incorporated into the interventions for this unit.

Benefits of Collaborative Testing with First Semester Nursing Students in a BSN Program

Maria D. Gillespie, Ed.D., RN, Lee Ann Waltz, MSN, RN,CNE

The objective of incorporating collaborative testing in a first semester nursing course was to encourage group learning and teamwork, induce critical thinking through discussion, improve retention of content, and reduce test-taking anxiety.

Becoming accustomed to NCLEX type questions is a struggle for beginning nursing students. Despite faculty encouragement to study in groups, many students are reluctant to do so. Students are very anxious about their first exam in nursing school and a fundamentals course is often the first time they must translate nursing didactic and theory to application-style questions. Collaborative testing is a learning strategy that allows the students to work together to complete an examination (Wink, 2004; Sandahl, 2010).

Collaborative testing was first utilized in the spring 2014 semester using two of the four course exams. The grade results of the first exam was used to assign groups for the two exams by equally distributing the students who had previously scored highest and lowest among the groups. Each student took the exam individually first, submitted their answers, then were assigned to groups of five to six students. The groups then had half of the originally allotted time to take the test. Each group assigned a “recorder” to bubble in one scantron for group submission. If the group made an “A”, each student was awarded three additional points. If the group made a “B”, each student was given two points. If the group made a “C”, each student was given one point. In order to be eligible for the additional points earned by the group, each student was required to individually pass the exam with a minimal score of 75.

Of the 136 students, 13 students did not pass the exams on their own. All other students received extra points from the group work. All groups, with the exception of one, achieved an “A”; the other a “B”, and none made a “C”. An increase in student grades were seen outside the group grade. During the first semester, grades increased from 78.8% to 80.1%; the second semester from 78.2% to 82.5%, and the third semester from 75.6% to 77.6%. Students were very complimentary of collaborative testing in their course evaluations stating how it assisted them in group study and retention of content. Instructors have continued with collaborative testing each subsequent semester, as course evaluations were favorable to the process. Discussion of material not only aids in retention but helps ease the way for first semester students to learn how to work through NCLEX type questions that most have not experienced before nursing school.

Building Cultural Sensitivity and Interprofessional Collaboration through a Study Abroad Experience

Irene Gilliland, Ph.D., RN, CNS, ACHPN, Russell Attridge, Pharm.D., MSc, Rebecca Attridge, Pharm.D., MSc, BCPS, Jeanette McNeill, DrPH, RN, CNE, David Maize, R.Ph., Ph.D.

The purpose of the study was to address the following questions:

1. To what extent do classroom and international travel experiences about a country and its people, customs, and health care increase knowledge, skills, and cultural awareness among nursing and pharmacy students?
2. To what extent does the study abroad experience with nursing and pharmacy students constitute a meaningful interprofessional education experience (IPE) which increases the student's knowledge and collaboration with another health care profession?

Educators and students are increasingly recognizing the transformative nature of study abroad (SA) experiences during undergraduate or graduate educational programs. Awareness of a different culture and increased cultural sensitivity, as well as broadening of insight and awareness of oneself as a member of a cultural group, are gained from even a short exposure to another country and its people. Additionally, in today's healthcare environment, collaboration among the various professionals is key to effectively facilitate care and improve patient outcomes.

A mixed methods design was used to evaluate cultural awareness and sensitivity. Quantitative data were collected from the Clinical Cultural Competency Questionnaire which measured students' knowledge, skill, and awareness of the host culture while student reflections provided the qualitative data. The CCCQ was administered on the first day of elective class in January and again on the return trip home. Students wrote their reflections immediately after completing the trip. Fifty students (pharmacy and nursing) participated in the study, one group travelled to China (n=30) and the other to India (n=20). Paired t-test was used to compare pre/post CCCQ scores and descriptive statistics were used to analyze demographic data. Qualitative data were analyzed by themes.

There was a statistically significant increase in knowledge from pre-class (M=17.66, SD=4.68) to post-trip (M=35.19, SD=6.75), $t(46) = -18.79$, $p < .0005$ (two-tailed); an increase in skill from pre-class (M=11.33, SD=3.45), to post-trip (M=19.98, SD=4.8), $t(48) = 11.13$, $p < .0005$; and an increase in cultural awareness from pre-class (M=21.38, SD=2.92) to post-trip (M=22.63, SD=2.17), $t(47) = 2.99$, $p < .004$. The results were consistent for both trips. These results suggest that students gained cultural knowledge, skills, and awareness, at least in the short term, from this type of experience. Themes identified were: 1) pre-conceived notions about the culture were challenged, 2) a greater appreciation for one's own lifestyle emerged, and, 3) a greater understanding gained about each of the health professions' roles. Further study is warranted to evaluate the long-term gain of SA experiences in terms of cultural awareness and interprofessional collaboration. Use of SA programs is a novel method to encourage IPE with a focus on enhancing acquisition of cultural competency skills.

Purposeful Hourly Rounding to Improve Patients' Satisfaction Scores

Taeil Jun, BSN, RN, Yarelys Zambrano, BSN, RN, Danielle Gunter

The purpose of the study is to improve hospital patient satisfaction scores (HCAHPS score) and quality outcomes through removing and addressing barriers of purposeful hourly rounding.

Hospitals are rated based on quality improvement and patient satisfaction scores. The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey rates the inpatient stay in 27 categories, ranging from communication with doctors and nurses, to pain management, to facility cleanliness and quietness (HCAHPS, 2015). Based on these scores, the hospital can lose or gain some percentage of the third party reimbursement. One way to improve patient outcomes and quality is through the use of purposeful hourly rounding (Ford, 2010). Purposeful hourly rounding is an evidence based strategy that includes proactive anticipation of patients' needs and improves patient safety. Evidence also shows "higher patient satisfaction, fewer falls and hospital-acquired pressure ulcers, and decreased call bell activation" (Brosey and March, 2015).

A data collection tool was designed to gather patient and staff perceptions on purposeful hourly rounding. Over a period of eight weeks a total of 30 staff members and 60 patients were surveyed. Data collected included patient demographic information such as length of stay, gender, age, top 10 diagnosis, number of discharges and admissions per day, and perception of how staff perform the purposeful hourly rounding. Additional data included staff demographic data, years of experience, and perception of purposeful hourly rounding and its value in bedside nursing care for this unit. Behavioral observations of staff were completed each week. Microsoft excel will be used to complete the data analyses by calculating mean, frequency, percentage of frequency, and making tables and charts.

Findings include lack of understanding regarding the value of purposeful hourly rounding, and a misunderstanding of what behaviors exemplify good purposeful hourly rounding. Barriers to successful implementation include lack of time management, and individual workload. Patients report that nurses often visit them at least hourly, but they are focused on their nursing tasks and not on the patient needs. Shift champion, purposeful hourly rounding algorithm, purposeful hourly rounding poster, tent card, and purposeful hourly rounding administration record will be used to improve hospital patient satisfaction score and quality outcomes.

The Skin Integrity Project: Improving Prevention Practices for Pressure Ulcers

Vanessa A. Martinez, BSN, RN-BC, Rosalinda T. Ferniz, BSN, RN, Danielle Gunter

The purpose of this quality improvement project is to identify factors causing the increase of hospital-acquired pressure ulcer rates of a 27-bed intensive care unit (ICU) within a four month period. The intensive care unit reported nine patients who developed Stage 2 or greater pressure ulcers compared to zero developments one year ago.

The study is needed to identify pressure ulcer causative factors to initiate prevention practices upon admission. Pressure ulcer development can be detrimental to the patient and have long-term consequences including pain, disfigurement, increased healthcare costs and hospital days, and increased morbidity and mortality.

Data collection methods included chart audits, an employee survey, unit observation, staff interviews, and assessment of the supply rooms. A template was created for the chart audits, to include: patient admission data, risk factors, and initial assessment findings. The sample size for the survey is 30 employee responses. Unit staff behaviors observed included collaborative teamwork, leadership, and communication. Unit processes observed included pressure ulcer prevention practices, turning or repositioning of patients, hygiene practices, patient acuity, nurse-to-patient ratios, and multidisciplinary rounding. Personal interviews were conducted with the unit director, charge nurses, staff nurses, the wound care nurse, and dietician, to gain their perception of the barriers they face to practice pressure ulcer prevention. Assessment of the supply rooms was conducted to inventory the unit's current skin care products and evaluate their ease of accessibility to the nursing staff. Data collection occurred over five weeks. Progress of the project for improvement of pressure ulcer prevention practices will be done by observing staff, and evaluating benchmark goals and pressure ulcer rates. Progress is considered when benchmark reaches down to 0.55 from 1.10 and zero pressure ulcers.

Preliminary findings indicated three areas of concern: a lack of staff education, ineffective communication, and inadequate skin care supplies. Chart audits indicated a need for staff education on pressure ulcer staging and evidence-based prevention practices. Nursing communication of skin breakdown lacks during hand off report and multidisciplinary rounds. There is a deficiency of appropriate skin care supplies, wound care supplies, and the turning and positioning system.

Quality of Life Distinctions between CABG and PCI Patients in a Cardiac Rehab Setting

Mary Mollenkopf, BSN,RN, & Violet Saenz, BSN,RN

This cohort study compared the differences of the health related quality of life (HRQoL) scores between post percutaneous coronary intervention (PCI) and post coronary artery bypass (CABG) patients completing Outpatient Cardiac Rehabilitation Phase II (CR).

CR is prescribed for PCI and CABG patients. Research links improved perceptions of quality of life to positive health outcomes. Evaluation of HRQoL scores can direct staff interventions during the CR program to guide patient outcomes.

A retrospective chart review was conducted on 31 records of post PCI (17) and post CABG (18) patients who completed CR. Both groups were gender (85% male) and age (mean age 69.5, range 65-80) equivalent. One-way ANOVA testing was completed comparing the percent change between CR PCI and CABG patients' pre and post HRQoL scores as measured by the Short Form 36 v 2 (SF36) survey. Eight physical and mental health components of the SF36 were analyzed and assessed for distinctions.

Statistically significant improvements in physical HRQoL perceptions were found in post CABG patients over post PCI patients in physical function ($p = 0.019$) and role-physical ($p = 0.025$). Further research is needed to determine if the HRQoL improvements were related to the procedures or to the CR program interventions.

Health Concerns of Mexican American Adolescents from a Bordertown High School in Arizona

Maritza Rodriguez, DSc, MA, BA, LATC

The purpose of this study was to determine the specific concerns that Mexican American high school aged youth have regarding their overall health and their knowledge regarding physical activity, obesity and diabetes.

A significant gap exists within the literature concerning Mexican American high school student's knowledge of specific health concerns, particularly related to physical activity, obesity and diabetes.

This descriptive study utilized both quantitative and qualitative methods in which 1,100 high school students from a border city in Arizona were given a questionnaire regarding health issues. Five hundred and ninety three students completed the questionnaire. Ten students were selected for a focus group to further assess health concerns and correlations with survey data. The questionnaire contained both open-ended and close-ended questions. Demographic data were assessed using descriptive statistics and thematic analysis was used for open-ended questions.

The study found that the majority of students (59%) did not have any health concerns. Of the stated concerns, cancer, sexually transmitted diseases and obesity topped the list. The focus group results were consistent with the survey data, however, additional concerns such as drugs, self-esteem, and bullying were noted. When comparing males to females, 60.9% of males did not have any health concerns while 58.3% of females said the same. The results for grade levels included 67.2% of freshman had no health concerns while 51.3 % of seniors said the same. The high school athletes presented with similar findings with 55% had no health concerns, while the athletes that played a sport outside of school were less concerned presenting at 60.4%. When asked in an open ended question about the benefits of physical activity, only 2% of male and females agreed that physical activity can prevent diseases. In a closed ended question, the majority of students surveyed made the connection that physical activity can prevent heart disease, however, they did not link the benefits of physical activity with diabetes or obesity; only 6.7% of males chose diabetes and 11.2% said obesity. Female results were alike with 6.5% connecting preventing diabetes with physical activity and 13.3% saying obesity is prevented along with physical activity. The results of the grade levels were similar with freshman at 3.7% and seniors at 11.9%. The high school athletes did not make the connection between preventing diabetes and obesity with physical activity, only 5.6% made the connection, while only 5.2% of athletes outside of school made the connection as well.

The results from this study indicate that among high school youth there is little understanding or reflection on issues concerning physical activity, obesity and diabetes. The implications are grave given that obesity is considered an epidemic within the adolescent population and we have an increasing incidence of Type II diabetes within the same group.

Programmatic Indicators for Board of Certification Success in CAATE Accredited Undergraduate Athletic Training Education Programs

Joanna E. Soles, DHSc, MS, ATc

The purpose of this research was to identify programmatic indicators correlated with first-time success on the Board of Certification (BOC) examination in undergraduate accredited athletic training programs.

The practical benefit of this research study relates to identifying and objectifying predictors of success in athletic training programs, as related to students successfully passing the BOC examination. As programs are held accountable for maintaining a 70% first-time pass rate on the exam, many program administrators will take a hard look at factors that may improve student success on the examination. According to the December 2014 report (CITE), 28% of bachelor-level accredited programs did not meet the 70% standard, and another 16% fell between 70 and 79%. These programs risk probation by CAATE and will likely be making significant programmatic improvements. Providing program stakeholders best practices for BOC examination success serves as a timely contribution to the field of athletic training education.

A quantitative, descriptive study was conducted with data gathered via website content analysis. A correlational study design was selected to better understand if particular programmatic variables were associated with students successfully passing the BOC exam on the first attempt. All undergraduate programs accredited by the Commission on Accreditation of Athletic Training Education (CAATE) were included for analysis. Of the 336 accredited undergraduate programs, 318 met the inclusion criteria. School and program data regarding admission and retention criteria, number of faculty with terminal degrees, gender of the program director, number of curricular hours required in the program, number and types of sciences required in the curriculum, school size, type, and location were gathered from program and school websites along with data gathered from the CAATE website regarding pass-rate, number of testers, and years accredited. These data were evaluated for correlations with programs' first-time pass rates on the BOC examination. Twelve independent variables were analyzed to assess for any correlation with BOC pass-rates.

The following factors were identified as correlated with increased success on the BOC examination: public versus private affiliation, university size, number of test-takers, university location, years of accreditation, number of faculty with terminal degrees, program admission requirements, and the number of science hours required in the curriculum. Many variables correlated with BOC success are intrinsic to the school, but some may be altered and should be evaluated if programs are looking for ways to improve.

Identification of Medication Administration Errors: A Direct Observation of Nursing Practice

Amina A. Tharpe, BSN, RN-BC & Maria-Cristina Caruso, BSN, RN

The purpose of this descriptive study was to utilize direct observation to describe medication administration errors committed by nurses during the medication administration process on a 28-bed medical-surgical telemetry unit of a large medical center in the Department of Defense.

Adverse drug events (ADEs) cost hospital organizations an average of \$8,750 per hospital stay. The medication administration process is the primary cause of ADEs due to systemic, environmental, and personal factors. Direct observation of medication administration yields greater accuracy in identifying medication administration errors (MAEs) and determining overall rates compared to post-hoc examination of incident reports.

Clinical nurses were observed during the medication administration process over a seven-day period of day, night, and weekend shifts. Observations were recorded via an established 14-item audit tool that consisted of medication administration guidelines and protocols. The items on the audit tool reflect established policies and protocols of the hospital that relate to medication administration. Each item was recorded as either “met,” “not met,” or “not evaluated” for each observation.

A total of 31 observations were made on three Licensed Vocational Nurses and 28 Registered Nurses. Two items on the 14-item audit tool (the administration of pain medications and the wasting of narcotics) did not occur during the observations and thus were excluded from the final data analysis. Four items (use of an updated printed Medication Administration Record (MAR) or use of bedside computer, inspection and labeling of all medications, immediately administering all withdrawn medications to intended patient upon removal from medication dispensary, and documentation of rationale for medications “HELD”) were observed 100% of the time. One item (withdrawal of medications from the medication dispensary on one patient at a time) was met 94.1% of the time. Four items (demonstration of the six rights of medication administration, performing the 2-patient identifier, counseling patient on medications administered, and immediate documentation of medications administered) was met 80-89% of the time. Three items (verification of the time in which each medication was last retrieved from the medication dispensary, nurses’ demonstration of understanding of policies and procedures of medication related incidents, and proper insulin verification) occurred less than 79% of the time.

High-miss areas on the audit tool included confirmation of patient allergies, checking the time medication was last retrieved from the medication dispensary, proper verification of insulin, and distractions from verbal or phone conversations during medication administration. Overall, the findings suggested that the nurses are aware of the proper protocols for medication administration, except for the aforementioned high-miss areas. The high-miss areas were identified as potential contributing factors to MAEs and can only be identified by direct observation of the medication administration process. Implications for future practice includes increased utilization of direct observation methodology for the identification of contributing factors of MAEs, which can then be utilized to educate staff and change behaviors that may lead to an adverse drug event.

Dopamine Agonists and Angiogenesis Induced by Vascular Endothelial Growth Factor

Sabeen Ali, Student, Alison Gregory, Student, FNU Gerilechaogetu, Postdoctoral Fellow, Rene Renteria, Assistant Professor, M. Lourdes Alarcon Fortepiani, Associate Professor

The purpose of this study was to determine whether dopamine suppresses VEGF-induced angiogenesis in retinal endothelium, specifically through dopamine type 2 receptors.

Vascular permeability factor/vascular endothelial growth factor (VPF/VEGF) is a potent cytokine known to play a vital role in the early steps of angiogenesis. Angiogenic growth occurs in certain diseases, including diabetic retinopathy, and in growth of cancerous tumors. Increased VEGF in these conditions is associated with increased blood vessel permeability and endothelial cell proliferation. Anti-VEGF treatments are effective but may cause detrimental side effects such as endocrine alterations and visual deficits. Dopamine, through its D2 receptor (D2R), has been shown to inhibit tumor-cell proliferation by inhibiting the phosphorylation of VEGF receptor 2, which is the main receptor that mediates angiogenesis. However, it is unknown whether D2R activation can inhibit VEGF-induced angiogenesis. Such activity may open an alternative avenue of treatment to suppress the effects of pathologically increased VEGF.

Commercially available human retinal microvascular endothelial cells were purchased and cultured. Cells were plated at different densities (2,500, 5,000, & 10,000/well) in 96 well plates and incubated for either 24h, 48h, or 72h within one of the following conditions: 1) Vehicle, 2) hVEGF (25 ng/ml), 3) Quinpirole (D2R agonist) (1 μ M), 4) Quinpirole (1 μ M) + hVEGF (25 ng/ml). At the end of the incubation period, proliferation was stopped, and cell number was estimated using a MTT proliferation assay. Every experimental group contained n=18 from 3 different plates.

The optimal experimental growth condition was 24 hours incubation of 2,500 cells/well. Under these conditions, hVEGF increased cell proliferation in human retinal endothelial cells compared to control (142.3 \pm 6.3 vs 100, normalized values). Quinpirole by itself did not affect cell number (103.4 \pm 5.56 vs 100), but in the presence of VEGF, quinpirole prevented the cell-proliferation induced by VEGF (104.4 \pm 7.67 vs 142.3 \pm 6.3). Thus, dopamine type 2 receptor activation can inhibit proliferation mediated by VEGF in human retinal microvasculature endothelial cells in vitro. This suggests dopamine agonists may be effective in limiting pathology caused by chronically increased VEGF in diseases such as diabetic retinopathy.

Alteration in anterior chamber depth and volume following postural change from upright to right and left lateral decubitus positions

Roman Golas, David Caceres, Carolyn Majcher, O.D., Richard Trevino, O.D., Susan Ly, Denisse Lopez, William Sponsel, M.D., Travis Lehr, Lane Smiley

To determine the response of ocular anterior chamber (AC) parameters following postural change from upright to right lateral decubitus (RLD) and left lateral decubitus (LLD) position over a 1-hr period in healthy adults.

Humans spend a large fraction of the day sleeping yet little has been published on the response of AC parameters with horizontal positioning and the effect of laterality. Potential shallowing of the AC associated with horizontal positioning may be partially responsible for the intraocular pressure (IOP) increase that is known to occur during sleep. These responses may be exaggerated in individuals with ocular disease associated with elevated IOP such as glaucoma.

We performed a prospective observational study. Anterior segment tomography (AST) was performed bilaterally using the Oculus Pentacam® on 15 normal adults in a seated upright position. The subject was then randomly placed in a RLD or LLD position for a 1-hr period after AST was repeated while the subject remained in the lateral position. All subjects returned on a separate date to repeat the procedure on the opposite side. Analyzed parameters included anterior chamber volume (ACV), central anterior chamber depth (CACD), and peripheral anterior chamber depth (PACD) at 6mm, 8mm, and 10mm eccentricity in the four principle meridians (superior, inferior, nasal, and temporal). Statistical analysis was performed using paired, 2-tailed t-test and assuming 90° rotation.

Average age (\pm SD) was 34 ± 12.5 years (range 23-58). Thirteen subjects were female and 2 were male. In order of decreasing depth, the upright mean PACDs at 6mm eccentricity were $2334\pm 323\mu\text{m}$ temporally, $2143\pm 353\mu\text{m}$ inferiorly, $1833\pm 344\mu\text{m}$ superiorly, and $1765\pm 302\mu\text{m}$ nasally. There was no difference in AC parameter change in dependent and non-dependent eyes between the RLD and LLD positions. There was a significant decrease in the ACV and CACD in dependent eyes (mean -5.73mm^3 $p < 0.001$, $-17\mu\text{m}$ $p=.05$) and non-dependent eyes (-3.87mm^3 $p=.01$, $-14\mu\text{m}$ $p<.05$). In the dependent eyes, there was a significant decrease in the inferior PACD at 6mm ($-96\mu\text{m}$ $p<.001$) and 8mm ($-233\mu\text{m}$ $p<.001$) eccentricities and the temporal PACD at 6mm ($-95\mu\text{m}$ $p=.01$), 8mm ($-182\mu\text{m}$ $p<.001$), and 10mm ($-88\mu\text{m}$ $p=.01$) eccentricities. Interestingly there was an increase in the superior PACD at the 6mm ($+105\mu\text{m}$ $p=.01$) and 8mm ($+125\mu\text{m}$ $p<.01$) eccentricities. In the non-dependent eyes, there was a significant decrease in the temporal PACD at all eccentricities (6mm: $-186\mu\text{m}$ $p < 0.001$, 8mm: $-275\mu\text{m}$ $p < 0.001$, 10mm: $-176\mu\text{m}$ $p < .001$).

There is a significant decrease in ACV and CACD bilaterally after assuming a lateral decubitus position for 1 hr. These changes are similar between RLD and LLD positions. The decrease in PACD appears to be localized to the inferior/temporal quadrants. Further research is needed to determine if this AC shallowing contributes to IOP elevation.

Optical and Neural Factors in Perception of the “Dress”

Brooke Houser, BS, Carolyn Talbert, BS, Ruh Patel, BS, Jeff Rabin, O.D., MS, Ph.D.

Our purpose was to determine if individual differences in pre-retinal absorption of blue light and early stages of neural processing impact perception of a dress as “Blue-Black” or “White-Gold” which achieved worldwide scrutiny on the internet & social media

In February 2015 an image of a dress was posted on Tumblr¹ which triggered an internet phenomenon debating the issue: Is the dress blue and black (BB) or white and gold (WG)? Many claim that the dress is BB while others are convinced it is WG. Fewer perceive the dress to be intermediate (light blue and burnt gold), while the actual dress colors are BB. This unprecedented dichotomy in color perception prompted opinions from scientists, politicians and celebrities alike with experts reporting that it depends on how one perceives the dress to be illuminated, with WG due to bluish (e.g., fluorescent) light BB due to yellowish (e.g., incandescent) light. However, direct evidence to explain this dichotomy in perception is lacking. Understanding such phenomena provides a basis for understanding and treating anomalous perceptions in acquired brain injury, stroke and Alzheimer’s disease.

Human macular pigment in the central retina absorbs blue light and is quantified as macular pigment optical density (MPOD) which varies between individuals and is modifiable by dietary and pharmaceutical agents. We evaluated 38 visually normal subjects with no history of ocular, systemic or neurologic disease and visual acuity of at least 20/25. MPOD was measured in right and left eyes using the QuantifEye MPS II. Each subject’s initial perception of the dress (BB, WG, other, not previously seen) was recorded with their current perception based on observation of the dress on iPhone 5, iPad, and LCD displays. Visual evoked potentials (VEPs; visual brain waves) were recorded binocularly from each subject from a gold cup electrode 1 cm above the inion referenced to the earlobes. The VEP stimulus was a color transparency of the dress retro-illuminated by a flashing white light from a VEP monitor. VEP amplitude and latency and MPOD were compared between BB and WG groups.

The WG group showed significantly higher MPOD compared to the BB group ($p < 0.03$). Since actual colors are BB, the tendency to see WG with higher MPOD likely reflects greater absorption of blue light. Moreover, WG VEPs showed longer latencies than BB ($p < 0.05$) which may reflect increased cognition time since the dress is in fact BB. Our results identify macular pigment and neural processing differences which better explain perception of the “dress” which may prove useful in diagnosis of challenging neurological conditions.

Persistence of intraocular pressure elevation following postural change from upright to right and left lateral decubitus positions

Carolyn Majcher, OD, Richard Trevino, OD, Roman Golas, David Caceres, Susan Ly, Denisse Lopez, William Sponsel, MD, Travis Lehr

The purpose of the study was to evaluate the persistence of intraocular pressure (IOP) elevation with lateral decubitus positioning and the effect of laterality.

Humans spend a large fraction of the day sleeping yet little has been published on the persistence of IOP elevation with horizontal positioning and the effect of laterality. We performed a prospective observational study to determine IOP response to a change in body position from upright to right and left lateral decubitus positions (RLD, LLD) over 1 hr in healthy adults.

IOP was measured on 30 healthy adults using the iCare® rebound tonometer in a seated upright position. Subjects were then randomly placed in a RLD or LLD position while IOP was measured every 15 minutes for 1 hr. Twenty subjects returned on a separate date and repeated the procedure on the opposite side. 26 RLD procedures and 24 LLD procedures were conducted. Statistical analysis was performed using paired, 2-tailed t-test.

Results: Average age was 31.3 yrs (SD 10.5, range 23-58). In the RLD position the IOP of the lower or dependent eye (DE) rose from a mean of 14.7 ± 3.3 mmHg to 17.5 ± 3.8 mmHg at 60 min ($p < 0.001$), while the upper or nondependent eye (NDE) rose from a mean of 14.6 ± 3.3 mmHg to 16.0 ± 3.0 mmHg ($p = 0.01$). When placed in the LLD position the IOP of the DE rose from a mean of 14.9 ± 2.8 mmHg to 18.9 ± 3.3 mmHg at 60 min ($p < 0.001$), while the NDE rose from 15.4 ± 3.0 mmHg to 17.4 ± 2.8 mmHg ($p < 0.001$) (figs 1 and 2). In DEs, IOP peaked at 15 min for both positions then significantly decreased in the RLD position and remained stable in the LLD position. In RLD NDEs, IOP steadily rose but was not significant until 60 min. IOP elevation in LLD NDEs persisted for 30 min before significantly decreasing from the peak value. Among subjects tested in both positions, there was greater asymmetry between DEs and NDEs in the RLD position at 15 and 30 min as compared to the LLD position ($p < .05$). IOP elevation from baseline was significantly greater in LLD NDEs at 15 and 30 min compared to RLD NDEs ($p < .05$).

Conclusions: The IOP of dependent eyes increased within the first 15 min of changing from an upright to a lateral decubitus position and then remained stable or declined thereafter. NDEs behaved differently depending on laterality with IOP elevation occurring more acutely in LLD NDEs than RLD NDEs which continued to increase throughout the 1 hr period. In both positions IOP elevation was greater in DEs than ND eyes.

The Impact of Hands-Free Phone Communication on Color and Luminance VEPs

Ruh Patel, BS, Brooke Houser, BS, Carolyn Talbert, BS, Jeff Rabin, O.D., MS, Ph.D.

Our purpose was to determine if simulated hands-free phone communication affects luminance and color VEPs.

Our previous results showed that response time and error rate for recognition of low contrast color and luminance (black-white) letters are increased when required to communicate on a “hands-free” simulated phone call. We furthered this evaluation with standard luminance visual evoked potentials (VEPs; visual brain waves) and found that hands-free communication had minimal effect on standard VEPs suggesting that the site of brain involvement is beyond that recordable with VEPs. We further explored this effect using low contrast color and luminance VEPs which were comparable to the stimuli used in our original study of letter recognition.

A Diagnosys LLC VEP system with color LCD display was used to generate cone-specific red, green and blue cone checkerboards as well as low contrast white on a grey background in pattern onset mode (2 onsets/sec.). Isolation of each cone type was based on measurement of luminance and CIE chromaticity and transforming these values to cone contrasts (Spyder-4 colorimeter). VEPs were recorded from 40 subjects with verbal communication (VC). In the VC condition the subject answered scripted questions requiring cognition broadcast from a bluetooth device adjacent to the VEP screen. VEPs also were recorded from all subjects without communication (NVC) with order counterbalanced across subjects. Repeated-measures ANOVA was used to compare VEP amplitude and latency across VC and NVC conditions.

There was no significant difference between VC or NVC groups in terms of VEP amplitude ($F=0.08$, $p>0.78$) or latency ($F=1.29$, $p>0.25$) and no significant interactions ($p>0.81$). These findings are consistent with the results of our previous study using standard black-white VEPs measured with and without VC. While hands-free phone communication can decrease performance and delay response time on letter recognition tasks, the site of this effect resides at a higher level of processing than that measured by color and luminance VEPs.

Neural Compensation for Color Deficiency: Binocular Enhancement of Cone-Specific Color Visual Evoked Potentials (VEPs)

Jeff Rabin, O.D., MS, Ph.D., Andrew Kryder, BS, Dan Lam, BS

Our purpose was to determine if central nervous system (CNS) control mechanisms operate developmentally to optimize function in hereditary color vision deficiency (CVD) by comparing binocular to monocular cone specific color VEPs.

Central nervous system (CNS) degeneration often precedes glaucomatous retinal changes suggesting that glaucoma is a CNS disease. Moreover, preservation of the binocular field in glaucoma as well as cognitive function in Alzheimer's disease are mediated by CNS control (1, 2). Hence we wished to determine if comparable CNS control mechanisms operate developmentally to optimize function in hereditary CVD by comparing binocular to monocular cone specific color VEPs.

Red (L), green (M) and blue (S) cone specific VEPs were recorded in pattern-onset mode with colored checkerboards on a grey background (L&M cone: 1 deg. checks, S cone: 2 deg., 2 onsets/sec., Diagnosys LLC). Display luminance and CIE chromaticity were transformed to cone contrasts to selectively stimulate L, M and S cones. Subjects included 17 color vision normal (CVN) and 11 hereditary red or green CVDs confirmed to be CVD on a battery of tests. The ratio of binocular VEP amplitude (N1-P1) to mean (RE & LE) monocular amplitude was used to quantify enhancement.

CVDs showed binocular facilitation of VEP amplitude (enhancement >2X; mean = 3.1X) for the color corresponding to their CVD. Values exceeded enhancement for other cone types within CVDs (3.1x vs. 1.2x, $p < 0.003$) and compared to CVNs (3.1X vs. 1.2X, $p < 0.007$). Binocular facilitation of CVD VEPs remained high (2.4X) even when quantified as binocular amplitude/higher amplitude from right or left eyes (2.4X vs. 1.1X, $p < 0.008$). Dichromatic CVDs did show an enhancement effect. These findings indicate that hereditary CVDs with anomalous trichromacy show binocular facilitation of VEPs for the color corresponding to their CVD. This suggests neural compensation for CVD similar to preservation of function in glaucoma and Alzheimer's disease. Other congenital anomalies and rod-cone, macular and/or corneal dystrophies may be subject to neural compensation. Elucidation of underlying mechanisms could lead to new treatments for visually debilitating disease. (1) Crish et.al, PNAS 2010;107:5196–5201. (2) Sponsel et.al TVST 2014;1-13

Ubiquitin Carboxyl-Terminal Esterase L1 (UCHL1) Regulates Stem-Like Cancer Cell Populations in Pediatric High-Grade Glioma

Patricia C. Sanchez-Diaz, Judy C. Chang, Tu Dao, Yidong Chen, Jaclyn Y. Hung

Ubiquitin Carboxyl-Terminal Esterase L1 (UCHL1) is a deubiquitinase enzyme of the ubiquitin/proteasome (UPS), a pathway involved in protein turnover. UCHL1 has been found to be deregulated in some cancers and aberrant activity of the UPS pathway has been demonstrated to mediate cancer cell survival and proliferation. In this work we used human cell lines to study the function of UCHL1 in pediatric high-grade glioma cancer stem cells (CSCs).

Pediatric high-grade gliomas (HGG) represent 8–12% of all primary tumors of the nervous system in children. Five-year survival for these pediatric aggressive tumors is poor (15- 35%) indicating the need to develop better treatments for pediatric HGG. Cancer stem cells (CSCs) represent a highly tumorigenic subpopulation within the tumor responsible for its relapse. Depicting the pathways that regulate maintenance of these CSCs may lead to novel therapies and improved patient outcomes.

SF188 cell line was kindly provided by Dr. Daphne Haas-Kogan of the University of California at San Francisco. SJ-GBM2 was obtained from the Children's Oncology Group (COG) Cell Culture and Xenograft Repository. Stable UCHL1 knockdowns (KDs) were obtained through a lentiviral transduction system (Addgene) using puromycin as marker for selection. Two different shRNA constructs targeting UCHL1 coding region were used. Cells infected with shTurboGFP vector were included as control in all experiments. Cell invasiveness was measured using CytoSelect 24-Well Cell Invasion Assay (Cell Biolabs). Sphere formation was used as CSCs read-out assay. One-way ANOVA (SPSS, IBM) was used to determine statistical significant differences in these in vitro assays. RNAseq (Illumina) and Ingenuity Pathway Analysis (Qiagen) were conducted to identify UCHL1-associated gene networks.

UCHL1 depletion caused an impairment in sphere formation (65% and 90% reduction in SF188 and SJ-GBM2 respectively) compared to the cells expressing the control shRNA construct ($p < 0.01$). A 90% decrease in invasiveness was also observed in all the UCHL1 KDs ($p < 0.001$). Preliminary transcriptome comparisons of UCHL1 KD versus vector identified approximately 300 differentially expressed genes including: *ACTA2*, *FBXL7*, *FBXW11*, *LIF*, *POSTN*, *GDF15*, *HMOX1*, *KIT*, *RAC1*, *WNT5A*, *PIK3R1*, *SOX5*, *PIP5K1C*, *NURP1*, *CDKN1A*, *AQP4*, *AQP3*, *CXCL12*, *DLL1*, *DLK1*, *DLX4*, *ITGA11*, *ITGB8*, *MTSS1*, and *TLR4*. In silico gene ontology analysis of the identified genes revealed significant enrichment of the processes involved in cell adhesion, invasion, and motility. In addition, and using a TCF-dependent TOPflash reporter activity assay, we found a 30% reduction in Wnt signaling activity in the UCHL1 knockdowns compared to controls.

UCHL1 inhibition impaired invasiveness and sphere formation in pediatric high-grade glioma cell lines. Gene expression and bioinformatic analyses identified cell adhesion, invasion, and motility as potential biological processes regulated by UCHL1. Our results suggest that UCHL1 may regulate CSC self-renewal in pediatric HGG. Thus targeting UCHL1 might complement current therapeutic regimens by attacking the tumor at its root.

Flipped classroom and its association with student performance

Patricia C. Sanchez-Diaz, DVM, Ph.D., David S. Fike, Ph.D., Susan M. Hall, Ph.D.

A flipped Biochemistry and Molecular Genetics course was used to evaluate the impact of pre-class work in student course performance.

Teaching basic sciences to health care professional students can be challenging. Blended-learning and flipping the class are becoming popular strategies that aim to prepare students for higher-order thinking activities during class.

Approach to course flipping: Using Blackboard, we created weekly course learning modules for students to complete prior to class. Each module was released to the students at least one week before class and contained a brief description of the learning module, the instructions to complete the pre-class assignments, a discussion board for students to indicate the muddiest points of the module, and a pre-class quiz. During class, we used “just-in-time teaching”, clinical cases, interactive multiple-choice questions, and some lecturing to further clarify the main concepts.

Evaluation of student performance: Frequency of pre-class work completion (specifically reading assignments) was collected from students via a five-point Likert survey (1= Never; 2= Rarely; 3= About half of the times; 4= Most of the times; 5= Always). For each individual student, in-class performance was measured over the entire semester using TurningPoint Technologies (i.e. average score of >70 multiple-choice items distributed along 10 face-to-face sessions). Individual midterm and final exam scores were also included in the statistical analysis.

Statistical analysis: Linear regression analyses (IBM SPSS 22) were performed using “course performance” (either as in-class, midterm, or final exam grade) as dependent variables and “frequency of completing pre-class work”, “gender”, and “ethnicity” as independent variables. A *P* value of .05 was used as cutoff for significance.

Frequency of completing pre-class work was correlated with in-class performance ($P = .045$) and in-class performance with final exam performance ($P < .001$). However, we did not find a statistically significant correlation between frequency of completing pre-class work and students’ performance in any of the two exams.

So, our findings suggested that, while pre-class work may have an impact in short-term learning, its effect might be diluted when considering subsequent high-stakes assessments. By asking students to become an active part in the learning process we might be able to increase in-class learning. In-class performance can be a predictor of course outcome. Thus, activities that increase in-class performance may directly or indirectly impact student learning.

Development of Normative Values for a Novel Test of Dark Adaptation

Carolyn Talbert, BS, Brooke Houser, BS, Ruh Patel, BS, Jeff Rabin, O.D., MS, Ph.D.

The purpose of the study is to establish normative values for a new test of two-color dark adaptometry (DA) which can be administered during the dark adaptation phase of flash electro-retinograms (ERGs).

DA is a clinical test to determine the lowest intensity light one can see after adapting to darkness. DA is extremely useful for the diagnosis of blinding retinal diseases including retinitis pigmentosa (night blindness), congenital stationary night blindness, rod monochromatism and age-related macular degeneration. Hence it is incumbent upon us to make this rarely utilized test clinically available with well-defined limits for normal and abnormal DA. DA is typically conducted in patients also requiring the flash electroretinogram (ERG), an objective electro-diagnostic response to light under dark and light adapted conditions. We developed a novel test of DA which can be administered during the standard 20 minute dark adaptation period of the standard ERG using a red light to measure DA mediated by the retinal cone (daytime) photoreceptors and blue light to measure rod (nighttime) photoreceptors.

The Diagnosys LLC visual electro-diagnostic system in the UIWRSO Visual Neurophysiology Service was used to measure DA on 21 visually normal subjects. The stimulus was presented with a Ganzfeld (white dome stimulus) with chin and headrest; the same stimulus used for ERGs. Each subject was positioned comfortably in the Ganzfeld and initially underwent 75 seconds of bright light adaptation (1000 cd/m^2) to ensure equal states of initial light adaptation. The 20 minute DA period then commenced and the subject pressed a button each time she/he detected a brief flash of light which diffusely illuminated the Ganzfeld. A beep accompanied each flash of light which alternated between red and blue and increased and decreased in intensity in staircase fashion (like a hearing test) to determine the lowest intensity the observer could detect at each point in time. Approximately 25 DA thresholds were recorded during the 20 minute DA period. The system stored digital results and printed individual results/DA curves for clinical evaluation.

Mean ($\pm 2SD$) red and blue DA was computed across all subjects for each of 25 successive points in time during the 20 minute adaptation period. Subjects were initially 1.9 log units more sensitive to blue vs. red light and 2.6 log units more sensitive to blue at the 20 minute point of DA ($p < 0.0001$) emphasizing greater sensitivity of rods to dim light when using blue light to which rods are more sensitive. Classical DA curves were plotted for red and blue stimuli with 95% confidence intervals bounding each point for comparison to patients with ocular disease. The new DA test has already proven useful in diagnosis of several eye diseases.

Understanding the Factors Influencing Students' Decision to Practice Low Vision

Matt Valdes, OD, FAAO, Stephanie Schmiedecke, OD, FAAO

The purpose of this study is to compare students' interest and perceptions about low vision before and after exposure to supplemental laboratory low vision modules.

The idea of flipping the classroom model, students learning material through video tutorials prior to attending class, emerged in the 1990s (Estes, 2014, p.2). Traditionally, optometry students have received their knowledge and information from textbooks and lectures. For a variety of reasons, educators are experiencing a significant push towards digital content (i.e. Information is changing at a rapid pace and material is outdated or out of print as is the case for many low vision textbooks). Educators relying on traditional teaching methods may need to consider other alternatives. According to an article in the New England Journal of Medicine, the last modification to medical school education was documented over 100 years ago in the Flexner report (Prober, 2012). We set out to examine factors influencing optometric students' decision to practice low vision upon graduating and determine if an improved understanding of the materials played a role. To our knowledge, research for using the flipped classroom model in low vision coursework has not been reported.

Students (n = 52) enrolled in the low vision course at UIW were given access to supplemental video tutorials to be viewed prior to each week's lab. Instructors used laboratory time to facilitate discussion, answer questions, and provide final instructions prior to initiating hands-on activities. Data was evaluated using SPSS Statistics 21, comparing students' responses to key indicators regarding their knowledge about low vision before and after exposure to the flipped classroom model. Anonymous surveys were distributed through the password-protected Course-Eval system prior to and after the completion of the low vision course. A 5 point Likert scale measured students' understanding, appreciation, interest and effectiveness of the low vision curriculum.

Pre/Post assessment scores regarding *understanding* and *appreciation* of Low Vision Rehabilitation (LVR) positively improved ([pre/post]: [2.88/4.23], [4.35/4.62]), reaching statistical significance (t [p-value]: t = 16.45 [p = <.0001], t = 3.44[p = 0.0012]). Questions regarding the use of video tutorials (*content delivery*) positively improved [3.94/4.43]reaching statistical significance (t = 17.69 [p = 0.0001]). Interest in LVR showed little change [3.03/2.90] and did not reach statistical significance (t = 0.8035 [p = 0.4236]). Initial findings suggest interest in practicing low vision goes beyond traditional didactic content. No correlation was observed between an increased understanding or appreciation for LVR and the desire to practice low vision. Of note, a majority (52%) of students completed their surveys using a mobile device. Future research on developing resources and content through mobile devices may lead to an increased interest in providing LVR.

The effects of sex hormone levels and menstrual cycle phase on intraocular pressure and central corneal thickness

Peter S. Wagoner, BS, Kristen McCraw, BS, Brian K. Foutch, O.D., Ph.D., FAAO, M. Lourdes Fortepiani, M.D., Ph.D., FAAO

The purpose of this study is to analyze the effects of ovarian hormone levels, estrogen, progesterone, and testosterone, as well as menstrual cycle phase and contraceptive use on intraocular pressure and central corneal thickness. Intraocular pressure (IOP) is an important factor in most forms of glaucoma, and improving our understanding of physiological predictors of IOP can aid in glaucoma diagnosis and treatment. Ovarian hormones provide one group of such predictors. There have been multiple investigations of the effects of menstrual cycle phase on IOP in human subjects. In addition, there have been multiple animal studies attempting to correlate hormone levels with IOP. The results of these studies have been equivocal, with little consistent support for a positive or negative correlation of any hormone with IOP. We hope to improve on the current evidence and provide more consistent results on these effects.

We have recruited and obtained informed consent from 22 female subjects (10 contraceptive users & 12 non-contraceptive users) that were either RSO students or optometric patients at RSO clinics. Prior to any data collection, each volunteer was screened for endocrine or cardiovascular disorders that may affect hormone levels using clinical patient history. Two experimental sessions were then scheduled for each subject to coincide with follicular phase (days 5-8) and luteal phase (days 19-26) of each subject's menstrual cycle. At the beginning of each experimental session, blood pressure and fasting blood glucose levels were measured in each subject prior to any further data collection. Each subject then provided a saliva sample, and the following measurements were taken on each eye: Intraocular pressure (IOP) measured with the iCare tonometer, central corneal thickness (CCT) measured with a handheld tonometer, and macular thickness (MT) measured via Cirrus spectral domain optical coherence tomography (SD-OCT). Saliva samples were stored at -20 degrees, and assays were performed to determine hormone levels for the first 20 subjects. Hormone levels were correlated with all other experimental outcomes. One way analyses of variance (ANOVA) were also performed to determine the effects of contraceptive use and menstrual cycle phase on IOP, CCT, MT and fasting blood glucose levels (BGL).

IOP and CCT were not correlated with hormone levels, but did correlate positively with each other for subjects overall ($R = 0.39$, $p < 0.01$). MT positively correlated with BGL for all subjects ($R = 0.26$, $p = 0.02$) and for contraceptive users ($R = 0.46$, $p = 0.01$). MT also correlated positively with estrogen levels for contraceptive users ($R = 0.40$, $p = 0.05$). Contraceptive use moderated the effect of estrogen levels on BGL. BGL correlated positively with estrogen for contraceptive users ($R = 0.36$, $p = 0.05$) but negatively for non-contraceptive users ($R = -0.59$, $p = 0.001$). Non-contraceptive users did have significantly higher IOPs (mean = 16.3 mmHg) than contraceptive users (mean = 14.5 mmHg). There were similar trends for CCT but no significant effects. The opposite was true for MT, with contraceptive users having a greater macular thickness (mean = 259 μm) than non-contraceptive users (mean = 247 μm). When BGL was considered separately by contraceptive use, there was no effect of menstrual cycle phase in non-contraceptive users (both means ~ 86 mg/dL). However, in contraceptive users, BGL was higher during the follicular phase (mean = 85.2 mg/dL) than in the luteal phase (mean = 78.0 mg/dL). While there were several significant findings overall, perhaps most interesting and clinically relevant is the significant effect of contraceptive use on IOP and MT. Future studies could easily investigate this without the aid of hormone collection.

Expression and Characterization of Functional Domains of Community-Acquired Respiratory Distress Syndrome Toxin (CARDS toxin)

Consuelo Azuaje, Biology Student, Thirumalai Kannan, Associate Professor

The goal of this study is to contribute to the growing body of knowledge surrounding *Mycoplasma pneumoniae*'s CARDS toxin and the mechanisms by which it is able to intoxicate host mammalian cells and inflict damage. Falling under the category of bacterial ADP-ribosylating exotoxins (bARES), CARDS toxin can transfer ADP-ribose portions of NAD⁺ to target proteins of intoxicated eukaryotes, ultimately yielding nicotinamides and H⁺ ions. CARDS toxin is exceptional among bARES, as the only known bacterial toxin which is capable of both ADP-ribosylation and of inducing vacuolization in host cells.

Although previous research has shown that MPN372 evokes vacuolization in mammalian cells and possesses key amino acids associated with NAD binding and ADP-ribosylating activity, further functional studies are still needed to delineate exactly how CARDS toxin function and which processes activate it.

An atypical bacterial pathogen, *Mycoplasma pneumoniae* causes acute and chronic respiratory infections, including tracheobronchitis and community acquired pneumonia, and is also linked to asthma. It is known to cause epidemics that emerge at three to seven year intervals and can last two years or more. Outbreak rates of *M. pneumoniae* among military recruits and other closed or semi-closed populations are high, and, as shown in some studies, *M. pneumoniae* is also the leading cause of bacterial pneumonia among hospitalized and non-hospitalized military personal. A 68 kDa protein, CARDS toxin was identified recently as the principal virulent factor in *Mycoplasma pneumoniae*, and possesses properties which can lead to inflammatory processes in the airway and also result in ciliostasis, loss of tissue integrity and injury, and cell death. The amino terminal ADP ribosylating region of CARDS toxin shares highest homology with *Bordetella pertussis* toxin S1 subunit, which retains all the essential amino acids necessary for ADP-ribosylating activity. The carboxy region of CARDS toxin does not share homology with any known protein, but exhibits vacuolating activity.

To identify the functional amino acids necessary for vacuole formation, the CARDS toxin gene was cloned into the expression vector, pET19b, after eight TGA codons within the coding region of CARDS toxin were changed into TGG to express in *E.coli*. Recombinant His-tagged protein was purified by nickel affinity column chromatography. HeLa cells were grown in minimum essential medium (MEM) supplemented with 5% fetal bovine serum at 37°C until 60-75% confluency was attained. Afterwards, they were intoxicated with 10µg/mL of rCARDS toxin for 24 hours and observed for CARDS toxin-induced morphological changes.

Results show that HeLa cells display highly vacuolated phenotype. To further characterize the functional properties of CARDS toxin, single amino acid mutations can be made using site directed mutagenesis and evaluate their efficacy as novel vaccine candidates against mycoplasma pneumonia induced infections.

Quantification by ELISA of the Levels of DNA Topoisomerases I, II α , and II β in the Nuclei of HuT 78 Cells Treated with Interleukin-2

Paul D. Foglesong, Ph.D., Rajeev S. Nair, M.S., Nikita K. Gupta, M.S.

This study examined whether the previously observed transient increases in the activities of these enzymes was due to changes in the amounts of the proteins (synthesis/degradation).

The changes in activities of the protein could be due to either changes in their amounts (synthesis/degradation) or by attachment of chemical groups to them; this study addresses the former mechanism.

The amounts of these enzymes in nuclear extracts of Interleukin-2 (IL-2)-treated HuT 78 cells were determined by quantitative ELISA using specific monoclonal antibodies, and the results were compared to the profiles of specific activities of the three enzymes from 0-12 hours after treatment with IL-2.

There was no direct correspondence in the amounts of DNA topoisomerase I or DNA topoisomerase II β with their specific activities in the nuclear extracts. However, the amount of DNA topoisomerase II α increased after treatment with IL-2 with a peak observed at 6 hours after IL-2, but the amounts of the enzyme did not correlate with its specific activities. These results indicate that the mechanism for the observed activation of DNA topoisomerase I and DNA topoisomerase II β is not synthesis/degradation of the proteins, but rather post-translational modification. However, the changes in the activities of DNA topoisomerase II α in the extracts appear to be due to both increased synthesis/degradation of that enzyme and also post-translational modification. It is hypothesized that phosphorylation of these proteins by protein kinases activated by IL-2 is the primary mechanism for the observed variations in their specific activities.

Biological Activity in the San Antonio River

Gabriela A. Hernandez Gonzalez, Biology/Environmental Science Student, Dr. Gerald Mulvey, Chair,
Department of Atmospheric Science and Physics

The study aims to substantiate the hypothesis that different land use of the San Antonio River's watershed ultimately affects levels of biological activity within the river.

Through history, the San Antonio River has had an interrelated role with people inhabiting the state of Texas. It began as the root of missions' development through its course and plays a main role in today's society. Since human exploit of natural resources has proven to have an effect altering their natural state and availability, among others qualities, monitoring becomes a priority to prevent further resource damage. Recent concerns regarding the decreasing availability of potable water makes water quality a main concern. This study searches to confirm a correlation among human alteration and use of land, and its effects over biological activity. It calls attention to provide further measures to control the adverse effects that lack of regulations can have over natural resources.

Land use and biological activity was analyzed in two parts: first by the relationship of bacteria and water quality, and then by water quality with surrounding land use. Data including bacterial count of *E.coli* strains, nitrogen and phosphorus concentrations were retrieved from the San Antonio River Authority's database. Measurements are collected through multiple monitoring stations localized though the river's course and its tributaries. For this study, only the upper and lower San Antonio River watersheds were analyzed. The measurements are recorded three to four times each month, and are available from 1998 to date according to the individual station. Biological activity and water quality relation was analyzed through correlation testing by individual station. Stations' sample size varied from thirty to fifty measurements. T-tests were performed to determine statistical significance of the correlations values for evaluation of null hypothesis.

Data regarding land use of the river's watershed was obtained from the Environmental Protection Agency's database, and visualized as a GIS file through the BASINS software developed by the EPA. Land use categories (urban, agriculture, forest, etc.) were further divided into three levels: high, medium, and low, according to presence over- surrounding watershed area by percentage per individual station. Land use relationship with water quality was assessed by comparison of these three levels. Water quality levels per station were categorized as well into high, medium, and low. These levels were assigned according to the variance of individual stations' mean from overall mean of measures through the river. Stations analyzed were selected based on location to be representative of particular land use.

Our preliminary results show a direct correlation (aprox. 0.76) between bacteria (*E.coli* MPN/100mL) and nitrogen levels (Kjeldahl mg/L) in agricultural land, where levels of nitrogen and phosphorus increase, thereby strengthening our hypothesis. Modification to data analysis will be made to account for a time delay between nitrogen and bacterial population growth according to runoff deposited in the river on previous dates.

Analysis of beta catenin gene expression and identification of beta catenin full coding sequence in the regenerating annelid *Lumbriculus variegatus*

Fernando A. Hernandez, Biology Student, Robert A. Miranda, Ph.D., Veronica G. Acosta, Ph.D.

Regeneration is the process of renewal, restoration, and growth that makes cells and organisms more resilient to natural fluctuations or events that cause disturbance or damage. The purpose of this study is to better understand the mechanisms involved at the cellular and molecular level that lead to successful regeneration in the annelid *Lumbriculus variegatus*. Our study aims to test the hypothesis that gene expression of the dual functioning protein, beta catenin, is changed during different time points in regeneration of our model organism.

The abilities of regeneration are limited in many higher phyla, and its mechanisms are not fully understood. *Lumbriculus variegatus* has regenerating abilities that allow it to grow and develop new tissue and tissue function after amputation or injury. Our model organism specifically has the capability to regenerate a new worm from three segments of the original worm, and can recover both structural and functional abilities along its anterior-posterior axis. Previous proteomic studies in our lab suggest that beta catenin, a cell-cell adhesion and transcription factor regulator, may play an important functional role in the regenerating mechanism of our model organism. In our study, we focus on measuring beta catenin mRNA expression during regeneration. The data obtained in our study can help us better understand regeneration and its mechanisms involved in *Lumbriculus*.

In order to further investigate the role of beta catenin and evaluate its gene expression, we developed a quantitative polymer chain reaction (QPCR) assay using bioinformatics tools and molecular techniques. Bioinformatics tools were used to create a consensus gene sequence from related organisms, which lead to the development of degenerate primers that were used to amplify and identify specific sequences in *Lumbriculus*. After identifying the partial coding sequences, we developed specific primers for our QPCR assay. In addition, to better understand the role of beta catenin, and elucidate its protein structure and amino acid sequence, we performed a rapid amplification of cDNA ends (RACE) PCR to identify its complete coding sequence.

Degenerate primers created for reference genes and beta catenin were run through PCR, cloned, and sequenced to create *Lumbriculus* specific primers. The specificity of these primers was tested through PCR, cloning, and sequencing. Results from this sequencing confirmed our amplification of beta catenin and validated our QPCR assay. We currently have regenerating tissue populations set up, and plan on extracting RNA from these tissues and running a QPCR. Results from this reaction will show the quantitative changes in levels of beta catenin expression throughout the regeneration timeline. Additionally, preliminary results for primers we designed for RACE PCR indicate that these primers are amplifying beta catenin. Our overall aim is to translate the data obtained from our model organism onto higher phyla, in hopes of subsequently identifying cellular and molecular regeneration mechanisms that may be conserved throughout these species. This will allow us to have a better understanding of regeneration and its mechanisms.

Weight Bearing Capacity of a Lightweight Bridge

Van Heye, Engineering Student, Nelson Sanmiguel, Engineering Student, Ande Sreedevi, Ph.D., P.E.

The goal of this project is to understand the importance of engineering design process in designing, building, and testing a model lightweight bridge that has the highest weight bearing capacity. Several prototypes were designed, built, and tested to understand the structural integrity of the model bridge.

Engineering design process is considered as the heart of engineering. It is a step-by-step method to produce a device, structure, or system. This project will detail each step that was followed in completing this project. Working on this project enabled the team to understand the importance of design process in engineering by hands on experience. In addition, it allowed them to recognize that there is more than one solution to a problem.

The project looks at several aspects of civil engineering by designing, constructing, and testing bridge designs that will support the most weight possible given certain building criteria. Designs will be tested to conclude the maximum load limit of each constructed bridge. To determine the maximum load limit, 100g weights will be placed at the center of the structure until its failure. All bridges must be built using glue, popsicle sticks, and paper with the legs of the bridge spanning a minimum distance of 300mm x 400mm.

Through the understanding of what shapes hold weight the best, the team constructed a simple truss bridge with the base structure of a triangle. The compression weight at the top of the bridge applies force to the sides and creates a tension force through the base beam/side of the triangle. This allows weight to be distributed evenly around the structure. This also means that the triangle structure is more stable than any other.

This project will showcase engineering design steps along with the evaluation of different designs in building a lightweight bridge. Project data collected in early December 2015 showed that the truss bridge supported approximately 28lbs before failure. The failure was caused due to several factors, which will be discussed in the poster.

miniGEMS - UIW Engineering Summer Camp for Middle School Girls

Dr. Sreerenjini Nair, Associate Professor, Dr. Michael Frye, Associate Professor

miniGEMS (Girls in Engineering, Mathematics, and Science) was a free five-day engineering summer camp organized and run by the Autonomous Vehicle Systems (AVS) Laboratory at the University of the Incarnate Word (UIW) for middle school girls during the week of July 6 to July 10. The primary goal of the camp was to introduce more females into the field of engineering through robotic projects and competitions, guest speakers, and field trips. The camp had additional emphasize on providing learning and research opportunities for girls from underrepresented communities.

miniGEMS was the first camp ever in San Antonio, TX for middle school girls with a special focus in engineering and research. Despite being held for the first time, there were 26 middle school students from various school districts of San Antonio. The program was funded by a grant from the Texas Higher Education Coordinating Board Engineering Summer Program. The camp was planned, coordinated, and directed by the authors who were also the principal investigators of the program. Additionally, four engineering research assistants from the AVS Laboratory and three middle school teachers from San Antonio school districts helped with the daily robotics projects and competition.

The first half of the week focused on the EV3 Lego Mindstorms robots for the campers to learn about robotics, autonomous land navigation, and computer programming. The students also had the opportunity to build and compete using the SeaPerch underwater robots, provided by a grant from the Office of Naval Research. This was the first time that the SeaPerch was used for a middle school girls' competition in Texas. The campers had hands-on experience in building robots as a team which could be guided through an underwater obstacle course. The last day of the camp consisted of a field trip on digital art and engineering, and an awards presentation and banquet for outstanding research achievements.

Daily and final program surveys were conducted to assess the effectiveness of miniGEMS 2015. The daily surveys indicated the program execution efficiency and allowed immediate corrective actions, if necessary. Based on the results of the final program survey questions, we feel that the objectives of miniGEMS were met and that the week-long camp was a success.

The students' interest in engineering as a potential career increased considerably, partially due to popular, hands-on, robot projects and the daily guest speakers, as were reflected in the post-survey results. The miniGEMS students' understanding of engineering greatly increased along with what courses to take in high school to prepare for a college engineering program. Analytical skills were developed through the robot design competition which required building and then programming the robots. An overall understanding of the skills needed to be an engineer were reflected in the answers on the daily surveys, the lab notebooks, the final essay and presentation, miniGEMS summative survey, and results from the post-survey.

**Comparative Respiratory Systems in Terrestrial Arthropods:
A Laboratory Exercise in Animal Physiology**

Sara Tallarovic, Associate Professor of Biology & HSI-STEM Project Director, Karly M. Brightwell, Student, Caitlin Schlagal, Student

In this laboratory exercise, students compared CO₂ consumption rates between Madagascar hissing cockroaches, *Gromphadorhina portentosa* as a representative insect, and giant hairy desert scorpions, *Hadrurus arizonensis* as a representative arachnid. Students hypothesized that insects would have a higher metabolic rate than arachnids, and therefore predicted that *G. portentosa* would have a higher rate of CO₂ production than *H. arizonensis*.

This laboratory exercise was developed and researched in order to be completed in a behavioral or physiological laboratory setting. The lab is designed to have students working with live animals that are easily handled and need not be euthanized at the end of the experiment.

Metabolic data were recorded using Vernier LabQuest 2 handheld data collectors with Vernier CO₂ gas sensors and stainless steel temperature sensors. Our metabolic chambers consisted of 709.7 ml “Snap n’ Store” plastic food storage containers with holes cut to fit the CO₂ sensor and stainless steel temperature sensors. Approximately 2 cm of the barrel of the CO₂ gas sensors were wrapped in several layers of Parafilm to ensure a tight fit with the metabolic chamber. (Note: earlier pilot studies revealed the Vernier brand 250 ml chambers to have too narrow of an opening for maneuvering scorpions and cockroaches in and out of the container, and the 1000 ml chambers were too large for accurate CO₂ readings.) Students recorded CO₂ production and temperature for 30 minutes in both the cockroaches ($n = 8$) and the scorpions ($n = 7$). Using the analysis tool in the LabQuest 2 software, students fit a linear function to their recorded CO₂ data and used the slope and their animal’s mass to calculate a metabolic rate per unit weight for each subject. Rates of CO₂ production per unit body weight were then analyzed between the two groups (cockroaches vs. scorpions) in an unpaired, one-tailed T-test in MS Excel.

Our results supported the hypothesis that Madagascar hissing cockroaches have a higher metabolic rate than giant hairy desert scorpions. This difference is likely related to differing anatomy of their respiratory systems but may also be influenced by the feeding strategies and life histories of each species. While both species are primarily nocturnal, we observed anecdotally that the cockroaches are much more active than the scorpions in general during both the day and night cycles in the laboratory. Higher activity levels would be expected in a species that forages each night rather than waiting for a more stochastic feeding opportunity.

The Thermic Effect of Food in Scorpions: A Laboratory Exercise in Animal Physiology

Sara Tallarovic, Associate Professor of Biology & HSI-STEM Project Director, Karly M. Brightwell, Student, Caitlin Schlagal, Student

In this laboratory exercise students compared CO₂ production of giant hairy desert scorpions before and after feeding. Measuring CO₂ levels is not a direct measure of SDA, but does provide an indirect measure of metabolic rate. Students also measured temperature in the metabolic chamber during the experiment. Students formulated the hypotheses that giant hairy desert scorpions would exhibit a higher rate of CO₂ production and produce more metabolic heat after feeding compared with those that had not been fed.

This laboratory exercise was developed and researched in order to create a lab activity that can be completed in a behavioral or physiological laboratory setting. The lab is designed to have students working with live animals that are easily handled and need not be euthanized at the end of the experiment.

All scorpions were fasted for at least two weeks prior to the laboratory experiment. Half of the subjects for this laboratory were fed a live cricket (*Acheta domestica*) several hours prior to the start of the laboratory period, and were the “fed” treatment group. Scorpions that were not fed prior to the laboratory period were the “fasted” treatment group. Scorpions were weighed immediately prior to the start of the experiment.

Metabolic data were recorded using Vernier LabQuest 2 handheld data collectors with Vernier CO₂ gas sensors and stainless steel temperature sensors. Our metabolic chambers consisted of 709.7 ml “Snap n’ Store” plastic food storage containers with holes cut to fit the CO₂ sensor and stainless steel temperature sensors. Laboratory groups measured one fed and one fasted subject for 30 minutes each. Using the analysis tool in the LabQuest 2 software, students fit a linear function to their recorded CO₂ data and used the slope and their animal’s mass to calculate a metabolic rate per unit weight. Data for all groups were pooled to create a class data set. Data were analyzed using an unpaired, one-tailed T-test in MS Excel.

The results indicate that *H. arizonensis* has a significant increase in postprandial metabolic rate compared to the fasted state. These results are consistent with a study on specific dynamic action in scorpions (Belanich and Secor, 2013) in which *H. arizonensis* was included. Although CO₂ production increased markedly within an hour or two of feeding, we did not see a consistent change in temperature. This may be due to too much fluctuation in the air conditioning in the laboratory. Running this experiment in a temperature controlled environmental chamber might produce better results.

For potential extensions to this laboratory exercise, students can make comparative measurements of a large-bodied arthropod that forages continuously rather than undergoing long periods of fasting. Pilot studies in our laboratory used Madagascar hissing cockroaches, *Gromphadorhina portentosa*, as a comparative model system. In pilot studies we saw no significant difference in CO₂ production between the fasted and fed state in hissing cockroaches, and furthermore, metabolism did not appear to drop at all during periods of fasting.

Rain Activated – Automobile Window Circuit

Wisdom Wallandi Trekpah, Engineering Student, Shawn Melendez, Engineering student, Sreedevi Ande, Ph.D., P.E.

The objective of this project is to use a rain-detector circuit to enable the window of an automobile to roll shut, when left opened on a rainy day. This concept will be further analyzed for flood warning and control purposes.

The interior of an automobile will be damaged if the windows are left open on a rainy day. To prevent the damage, a mechanism is designed based on Ohm's law and the forward and reverse polarity of a D.C. motor. The idea behind this project is water damage and flood control. The chosen circuit is to exploit the conductive properties of water to detect an imminent water damage or possible flooding situation to activate control measures.

A rain-detector circuit is analyzed to incorporate it in the window mechanism of an automobile. The rain activated circuit is tested in an unattended automobile on a rainy day or a simulated rain situation to ensure the circuit will stop water damage by rolling shut the windows of the automobile.

The circuit analysis which is used to develop a rain activated circuitry is based on Ohm's law and Kirchoff's law and the forward and reverse polarity of a D. C. motor, taking advantage of the conductive properties of water as a trigger to drive the window motor of an automobile shut. An audio device and a light-emitting-diode (L.E.D) are incorporated for visual and auditory purposes.

The circuit responds to water in a lab test by triggering an L.E.D indicator. The design proved to be successful. The experiment and the results will be discussed during the poster presentation. This concept can be utilized in flood prone areas as a warning system, or to activate flood control barriers, helping to reduce flood related deaths.

Air pollution and visual function – Preliminary report

Jordan M. Wetz, B.S., Philip Aitsebaomo, O.D., Ph.D., Carlos A. Garcia, Ph.D.

The physiological status of the mammalian retina can be assessed by the electroretinogram (ERG). Previous work in our laboratory has demonstrated that exposure to the gaseous air pollutant ozone (O_3) decreases the concentration of the neurotransmitter dopamine (DA) in the retina. The purpose of this study is to investigate the effects of O_3 on the status of the retina and thus visual function in the dark and light adapted retina of Long Evans rats.

Millions of people live in air polluted environments. Many in this population also suffer from retinopathies. The recent investigations in our laboratory suggest that O_3 may be altering the synthesis of DA by directly inhibiting the enzymes involved in DA synthesis or altering the structure of intermediate compounds involved in DA synthesis. The previous work also proposed O_3 exposure disrupted vision. The current work demonstrates changes in the function of the retina. It also provides useful data in establishing air quality standards to better protect the populations living in air polluted areas and prevent the oxidative stress that too often contributes to retinopathies and blindness.

Age- and sex-matched rats were randomly separated into two groups (n=6 rats); three control (clean air) and three acute O_3 -exposed groups (0.4 ppm for 4 hours). In each rat, the scotopic and photopic ERG was recorded. Both eyes were sequentially recorded in each rat. Recordings were performed under general anesthesia (ketamine 70 mg/kg, xylazine 2.5 mg/kg, IM). The active corneal electrodes were designed for use in rats. A ground needle electrode was placed subcutaneously in the real flank of the animal. Pupils were dilated with 2.5% phenylephrine and 1% tropicamide eye drops. Lubrication and proper electrical conductance of the active electrode were maintained with 0.6% povidone and 1.4% polyvinyl alcohol (Refresh lubricant eye drops). Rats were dark adapted for 30 minutes before scotopic responses were measured. The scotopic, photopic and oscillatory potential ERG was measured in each rat.

Preliminary data indicates an acute exposure to the air pollutant O_3 disrupts retinal function as demonstrated by changes in the ERG response. Alterations in the inner retina oscillatory potential ERG indicates dopaminergic amacrine cell involvement possibly due to a drop in dopamine utilization. This clinically significant work demonstrates O_3 -induced oxidative stress aggravates retinopathies and contributes to vision deficits in sensitive populations living in air-polluted environments.

Solar in the city: Applying Chinese solar technology on the UIW campus

Alison F. Whittemore, Chair, Department of Engineering

The purpose of the study was to observe the use of photovoltaic panels and water heaters in urban areas of China and assess the possible applications of that technology on the UIW main campus.

Renewable energy is a ubiquitous topic in the discussion of the energy future of South Texas. Solar-powered devices bring a pollution-free supplemental energy source to users who receive electricity from a city power supply. A portable solar panel, small enough to be held in one's palm, can provide a full day's worth of power for a lamp, a radio, a cell phone charger, or a laptop computer. One commercial 200 watt solar panel, 5' x 2' in size, can supply approximately 0.75 kWh per day. The average home uses about 33 kWh of electricity per day.

The flat rooftops of the UIW campus are prime real estate for installing solar water heaters and solar panels for electricity. This research analyses the costs and benefits of photovoltaic installations on campus. While solar devices cannot entirely replace the need for bio-fuels, e.g., transportation, heating and cooling at night and during inclement weather, they can replace or supplement a significant percentage of bio-fuels with the free power of the sun.

I toured five cities in China, including Shanghai and Beijing. I observed urban rooftop solar installations. I recorded data on the energy production of solar water heaters and photovoltaic panels. I took a small, hand-held photovoltaic charging panel with me on the trip and recorded its efficiency in Shanghai and Beijing. Shanghai has a latitude of 31 degrees N; Beijing, 40 degrees N. I compared the panel data with similar charging situations in San Antonio, at 29.5 degrees N. As I expected, there were comparable efficiencies between Shanghai and San Antonio. I believe photovoltaic data from Shanghai can be accurately interpolated for similar sun exposure in San Antonio. This data will be used to predict the potential energy production for an installation of rooftop systems on the UIW campus.

The UIW main campus has approximately 600,000 square feet (56,000 square meters) of rooftops with full southern exposure. San Antonio has an average of 220 days per year of full sun. Using commercially available solar panels of 200 Watts each, there is a potential to produce up to 15,000 MWH (MegaWatt Hours) per year. Electricity rates in South Texas are 7.2 cents/KWH (KiloWatt Hour), comparable to rates of 8 cents/KWH in Shanghai. A full complement of panels could produce \$5,000 of electricity per day, or more than \$1 million per year with average sun exposure. Monthly campus electrical usage is currently being analyzed. Hot water usage in dormitories and classroom buildings is also being explored. Expenditures for the installation depend on the cost of panels, water heaters, and labor, which are being investigated at the time of this proposal. This study concludes that solar panels and solar water heaters could be a viable means of supplementing electricity and hot water on campus and reducing our public utility bills.

Costuming Hitchcock

Carla J. Anderson Perez, Fashion Management Faculty

The purpose of this study was to conduct a systematic investigation into the role of costumes and costumers used by Alfred Hitchcock in his films ($n = 37$) which cited costumers. Costumers and the costumes they develop are instrumental to the success of the director's vision. Costumers were first credited in Hitchcock's films beginning in 1935 (**39 Steps**) and continued for 44 years through his last film, **The Family Plot** (1979).

What actors wear is instrumental to a film's story line; therefore, the director's choice of costumer and in turn the costumes they select also plays a vital role in communicating the film's message. Costumes consist of articles of clothing (cloak, jacket, and undergarments) and accessories (scarf, tie, ring, and necklace). The visual aspects (color, line, and texture) of costumes can be selected by the costumer to further express a film's storyline and characters' personas.

All 37 Hitchcock films produced between 1935 and 1979 were viewed and reviewed by the researcher. The specific costumes and costumers of each film were identified and listed in association with the films in which they appeared. The roles of the costumes were then interpreted by the researcher. How costumers assisted Hitchcock to communicate the films' messages was investigated. The data were systematically organized, categorized, and analyzed for content.

Alfred Hitchcock's choice of costumer was as critical as the other selections (story, actors, and sets) were to each film; he was a master planner. Costumes both assisted actor's interpretation of their characters as well as played their own roles ranging from elusive to blatant. Costumes were observed to play pivotal roles in Hitchcock films. Many articles of clothing and pieces of jewelry were found to have pivotal roles and/or be used as clues in Hitchcock's films. Costumes were found to communicate emotion, reveal a character's motives, and as foreshadowing devices. In conclusion, costumes were observed to play pivotal roles in many Hitchcock films.

Fashion Students discover their heritage in garments designed with Mexican Textiles

Theresa A. Lopez, Sr. Instructor

An initiative to develop fashionable attire for a younger target market began with the “Somos” organization and design and merchandising students of UIW. Several issues were raised by students concerning the type of fabrications used, the sizing of the Mexican garment samples, and the outdated silhouettes. How can UIW Fashion Design students create modern designs that incorporate Mexican imported textiles?

A strong interest exists in the fashion industry to incorporate embroidered textiles and garments imported from Mexico in today’s fashions. Renowned designers such as Lydia Lavin, Carla Fernandez, and Carmen Rion are incorporating Mexican woven prints, designs, embellishments and floral appliques into their garments and introducing these modern styles in their collections in Europe, South America, and the United States.

At the 2015 Second Annual International Rebozo Conference in Mexico City (El Arte del Jaspe y El Rebozo) , anthropologists, museum curators, designers, faculty, and established artisans presented their textile research. The conclusion reached at the end of the conference was that the creation of the organic textiles and weaving designs are becoming extinct as the elder family members pass on and have no one to carry on the traditional textile craftsmanship.

Data was collected from nineteen students in the Textile Product Analysis Class, which reflected the following ethnicity: 80% Hispanic/Latino, 10% Black, 10% White. Students were asked: How would you redesign the Mexican garments? What Mexican textiles would you incorporate in your silhouettes?

The students created 78 designs ranging from daywear to evening garments. Fifteen sketches were selected as a collection, and garment specifications, flats, and findings were developed. As an additional assignment, two seniors created 15 final sketches, the patterns, followed by garment prototypes. Final garments are in the process of completion for half of the collection, with the remainder to be completed by volunteer students in the first quarter of 2016.

Learning outcomes included the appreciation of the handcrafts of the artisans. As students began working with the Mexican textiles, they studied stories of the artisans and developed a connection to their own Hispanic heritage. From a global perspective, discussions of the student’s work traveled through community organizations that support the sustainability of Mexican artisan’s work. As a result, The Pan American League will showcase the student collection at their Fiesta Fashion Show in April 2016. The Institute of Texan Cultures also expressed interest in displaying student garments in their collection of Mexican textiles of the future.

As a result of this ongoing project, an opportunity exists to provide internships in Mexico for students to work with artisans and exchange their knowledge of patternmaking while learning about the handiwork of the artisans. These internships have been offered to UIW by two of the international designers that have established working relationships with the Mexican artisans.

In 2016, a second group of design and merchandising students will be challenged to create a Fall collection with the popular Mexican rebozos. This will serve as the capstone project for Product Development majors scheduled to graduate in spring, 2017.

Levels of Student Empathy, Grit, & Burnout in an Entry-Level, Problem-Based Learning Doctor of Physical Therapy Program

Jennifer C. Kish, PT, DPT, SCS, COMT, CSCS, Jessie L. Dugan, PT, DPT, Sarah E. Luna, PT, DPT, GCS, Nathaniel A. Brown, PT, DPT, CSCS

The purpose of this study is to describe baseline levels of empathy, grit, and burnout exhibited by physical therapy student pre-professionals during didactic education and at various points of professional practice education (PPE).

Uncertainty prevails in today's healthcare environment along with increased risk for provider burnout and calcification in patient care. Physicians and medical students exhibit high rates of burnout and attrition. Little research has focused on burnout rates, risk factors, or levels of empathy and grit in practicing physical therapy clinicians or students. Risk factors for burnout include lost drive, depersonalization, and low sense of accomplishment and may be addressed successfully with empathy and positive psychology-focused student educational interventions. Historically, Physical Therapy (PT) as a profession has consistently ranked high in career satisfaction scores with good student retention rates in PT entry-level education programs. The transition in physical therapy education from entry-level masters training to entry-level doctoral training over the last decade has resulted in longer total curriculum time and PPE clinical assignments. Not much is known on how this might impact the potential for burnout or low levels of empathy in physical therapy education.

Pen and paper surveys were administered to University of the Incarnate Word (UIW) Doctor of Physical Therapy (DPT) students at the end of Academic Year 3 (AY3) and to a separate group of students at the start of Academic Year 1 (AY1). Surveys included the Jefferson Scale of Empathy, Health Professional Version (JSE), the 12-Item Grit Scale, and the Burnout Self-Test/Maslach Burnout Inventory (MBI) which is made up of three sub-scales: burnout, depersonalization, and personal achievement which combine for an overall score on the self-test. The pen and paper surveys were de-identified and administered in a large lecture hall by the lead author.

This is a prospective, longitudinal research design with plans to continue to track these cohorts into Academic Year 4 (AY4). The initial student cohort group samples included 51 AY3 students and 47 AY1 students. Descriptive statistics drove analysis of variables.

UIW AY1 and AY3 DPT students report high levels of grit and empathy. Female and AY3 students scored slightly higher than male and AY1 students. All participants reported low levels of *overall* burnout on the MBI. However, some students (mostly male and AY1), reported high scores for depersonalization (9%) and burnout (5%) and low scores for personal achievement (4%) within the in MBI sub-scales. Additional analysis is in progress to determine potential correlation relationships and statistical significance of these results.

The Effects of Creatine on the Well-Being of an Aging Population: A Systematic Review

Aaron C. Stares, SPT, CSCS, Mona Bains, Ph.D.

The purpose of this study was to answer the question “does Creatine supplementation enhance the healing efficacy of an aging population receiving physical therapy treatment?”

Numerous studies have analyzed the role of Creatine Monohydrate in the realm of young athletes and body builders. The results of these studies have established the ergogenic properties that Creatine Monohydrate supplementation possesses, including preferred energy storage, increased rate of protein synthesis, and accumulation of muscular hypertrophy, strength and endurance. These effects are not only vital components of sports performance, but also daily activity. However, there are relatively few studies about the effects of Creatine Monohydrate on an aging population, over 50 years old, or with moderate to low training stimulus. To our knowledge, this is the first systematic review to comprehensively present and discuss up to date research on the effects of Creatine Monohydrate on an aging population. This study could potentially reveal an advancement in physical therapy through enhanced patient care, accelerated healing time, a decrease in the number of treatment visits, and a decrease in the cost of healthcare.

For our literature review, the databases CINAHL, PubMed, Web of Science and SportDiscus were searched for the terms “Creatine supplementation”, “well-being”, “depression”, “safety”, “cognition”, “effects”, “body composition” and “adverse effects”. Articles were designated to a strength/endurance, body composition or cognition category for comprehensive review after meeting the inclusion criteria. All articles were critically appraised by two reviewers, cross referencing PEDro scoring, and number of times the article was previously cited on Web of Science.

Our study found that supplementation of Creatine Monohydrate is safe to use at appropriate dosage. Furthermore, Creatine Monohydrate may potentially enhance patient/client outcomes in an aging population, specifically in the areas of strength and endurance, body composition, and cognition when used in conjunction with moderate to low exercise intensity. These findings suggest that patients who are undergoing physical therapy treatment for neuro-musculoskeletal conditions may use Creatine Monohydrate to accelerate healing time in comparison to exercise alone.

EMG Activity of Abdominal Muscles in the Pilates “Hundred” Exercise

Amy Wagner, PT, DPT, GCS

This descriptive study aimed to investigate the activation of the abdominal muscles (rectus abdominus, external oblique, and rectus femoris) through surface EMG for the Pilates “Hundred” exercise with the hips at 5 different angles. This may inform future work designed to measure activation of muscle groups in this specific exercise in order to progress or modify it for individuals with injuries.

Pilates is an exercise method for strengthening the proximal trunk musculature. Prior literature on the Pilates Hundred exercise showed the rectus abdominus activity at 36.7% of a maximal voluntary contraction (MVC), and the rectus femoris at 33.0% MVC. Another study found that during the Hundred exercise, the rectus abdominus activation was 39.42 % MVC and rectus femoris activation at 56.28 % MVC with the legs fully extended. The position of the legs and hip angle may affect the activation of the abdominal musculature with the Pilates Hundred exercise. In order to justify positions to progress or modify the exercise, knowledge of muscle activity in different positions would be useful.

This study was a single subject design: the participant was a male in his 30’s with experience teaching Pilates and familiarity with the Hundred exercise. His skin was cleaned with alcohol prior to EMG electrode placement. Bi-polar surface electrodes were placed per protocol of Juker on the rectus abdominus (3 cm lateral to umbilicus), external oblique (15 cm lateral to umbilicus) and rectus femoris (8 cm inferior to inguinal ligament), right side. Delsys EMG was used at sampling rate of 1200/sec. The MVC was performed for 3 seconds in each muscle group, right side, per Juker protocol. The subject performed the Hundred exercise for 16 counts (4 in, 4 out, repeated twice) with arms pumping at side of hip with hips in tabletop, followed by 20 seconds rest. He repeated this with hips at 90° and knees fully extended, 60°, 30° and near 0 degrees. Hip angles were taken for descriptive purposes with video, with Dartfish software.

The percentage of MVC for the rectus abdominus was greatest with maximum extension of the legs. The rectus femoris was more active at mid-angle (70.1°) with 61.3 % MVC . The external oblique contributed minimally throughout, while the rectus femoris and rectus abdominus contributed similar amounts. In a trained subject, increased torque as measured by decreased hip flexion angle may increase recruitment of the rectus abdominus musculature with the Pilates Hundred exercise. An extreme limitation of this study is the single-subject design (n=1 sample size). More research with a larger sample size may reveal a trend in muscle activation with this common Pilates exercise in order to make evidence based modifications or progressions using the Pilates technique.

Breastfeeding Position Related Musculoskeletal Pain: A Pilot Study

Amy Wagner, PT, DPT, GCS

The purpose of this qualitative study was to identify aggravating and mitigating factors that contribute to post-partum (6 weeks to 12 months) musculoskeletal pain related to breastfeeding positions, also known as Breastfeeding Position Related Musculoskeletal Pain (BPRMSP), as well as the impact on quality of life and ability to breastfeed.

Breastfeeding is recommended by the American Academy of Pediatrics, the CDC, Healthy People 2020, and the World Health Organization for six months to two years as optimal feeding for children. It is common for post-partum women to have musculoskeletal pain, but very little is known about musculoskeletal pain in the population of women who breastfeed. Other occupations, such as dentistry and nursing, have conducted research regarding ergonomic risk factors for musculoskeletal pain, but not in relation to certain postures or positions associated with the occupation of breastfeeding in mothers. One study in Nigeria found a prevalence rate of BPRMSP in 15 to 20% of breastfeeding mothers. This may affect their ability to reach the breastfeeding duration levels suggested by leading health organizations. Although the prevalence has been determined, an open-ended investigation would be useful in understanding the nature of this problem.

A qualitative study was performed using purposive sampling. Twelve participants from La Leche League Conference in Texas were recruited. Inclusion criteria were delivery of a baby who was breastfed in the previous year, and being at least 18 years old. Exclusion criterion was surgery within the previous year. An open-ended survey on PsychData was conducted. Data was analyzed using a constant comparative process of analysis, and open coding on NVivo 10 software.

Themes from data analysis included: a decrease in duration in breastfeeding time due to pain; mothers preferred cradle and cross-cradle holds for younger infants, but side lying for older children; aggravators of pain including leaning/hunching forward, stress, excessive computer use, pumping frequently; and infrequent changing of nursing positions. Locations were back (lower, upper), neck, shoulder and upper arm to wrist; less frequent were buttock, hip and sciatic pain with prolonged sitting. Eases of pain included: use of pillows, particularly extensively throughout (not just one body area), ergonomic aids such as the “Boppy” pillow, frequent change of positions, and the use of manual therapies such as massage or chiropractic. These findings point towards a multifactorial cause of musculoskeletal pain with breastfeeding positions, and possible benefit of ergonomic aids for positioning. More research would be beneficial to investigate this phenomenon.

VISUAL ARTS ABSTRACTS

Scenic Model for The House of Bernarda Alba
Christopher McCollum

This is a finished, ½” scale model used to communicate to the Director and production team what the proposed design will look like. It also serves as an important tool for the scenic shop to understand the three dimensional details of the given design as well as specific finish treatments. Materials include: Illustration board, Foamcore, and acrylic paint.