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Eighth Annual
Research Week

Event Proceedings



University of the Incarnate Word
4301 Broadway San Antonio TX 78209

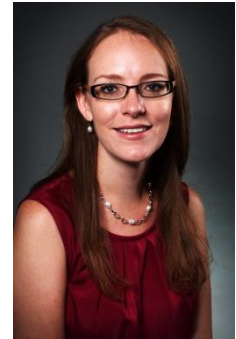
Eighth Annual
Research Week

February 23 – February 27, 2015

Event Proceedings



University of the Incarnate Word
4301 Broadway San Antonio TX 78209



Dear Colleagues,

It is with great pleasure we welcome you to the University of the Incarnate Word's Eighth Annual Research Week. In the Office of Research and Graduate Studies, there are many opportunities for us to showcase the work of our community, but few as comprehensively as Research Week. Over the years, we have intentionally designed and redesigned the Research Week events to be more inclusive, diverse, and representative of the UIW faculty and students whose scholarly work we now present.

As you attend the week's events and interact with the work of our community, immerse yourself in the incredible variety of expertise represented. These projects are not merely a reflection of singular work, but of an entire university of faculty, students, and staff committed to creating, developing, and disseminating knowledge. These individuals breathe life into the research mission of the university.

This annual celebration would not be possible without the support and effort of many individuals: the members of the Faculty Research Awards Committee, the administrators and staff of the Office of Instructional Technology, and many others. To those who contribute to the planning, implementation, and success of this week's events, we offer our sincere gratitude. To all presenters and attendees, we thank you for your contributions and engagement with our community of scholars.

Sincerely,

Kevin B. Vichcales

Kevin B. Vichcales, PhD
Associate Provost and Dean
Office of Research and Graduate Studies

Rebecca Ohnemus

Rebecca Ohnemus, MAA, CRA
Research Officer
Office of Research Development

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Event Schedule

Tuesday, February 24, 2015

Podium Presentations

Marian Hall Ballroom

12:00pm – 4:45pm

Wednesday, February 25, 2015

Formal Poster & Visual Arts Presentations

Marian Hall Ballroom

2:00pm – 4:00pm

Graduate & Professional Student Session

Marian Hall Ballroom

5:30pm – 7:00pm

Thursday, February 26, 2015

Podium Presentations

Marian Hall Ballroom

12:00pm – 4:15pm

Thursday Night Live: Fine & Performing Arts Presentations

Seddon Recital Hall

5:15pm – 8:00pm

Poster and Visual Arts Exhibits

Poster and Visual Arts Exhibits will be available for viewing by individuals or groups.

Monday, February 23, 2015

12:00pm – 7:00pm

Tuesday, February 24, 2015

8:00am – 7:00pm

Wednesday, February 25, 2015

8:00am – 7:00pm

Thursday, February 26, 2015

8:00am – 5:00pm

Podium Presentation Schedule

Tuesday, February 24, 2015

- 12:00pm **Welcome**
Kevin B. Vichcales, Ph.D., Associate Provost and Dean, Research and Graduate Studies
- 12:10pm **Fostering an Active-learning Environment by Using Technology to Flip the Classroom**
Harmsen, Roberts
- 12:35pm **A Model of Wellness Assessments and Recommendations to Promote Refugee Health and Community Integration**
Barr, Olexa, Ruiz, Gilada, Lopez, Whitaker, Rosales, Nguyen, Rivas, Gonzales, Denton
- 1:00pm **Impact of Educational Interventions on Nurse Self-Efficacy in Evidence Based Practice Implementation**
Dols, Kolb, DeStefano
- 1:25pm **14-3-3 and the Finding of Therapeutic Treatments**
Mesa, Casali
- 1:50pm **Gender Kaleidoscope: The Feminine Man, the Masculine Woman, the Genderless Human**
Ayala
- 2:15pm **Enforced Expression of Rad52 by Retroviral Transduction Decreases Class Switch DNA Recombination**
Guerrero, Tat, Taylor, Hayama, Hong, Casali
- 2:40pm **Feminist Pedagogy in the College Classroom: An Application of Elisabeth Schussler Fiorenza's "Wisdom Ways"**
Miller
- 3:05pm **Harmful Effect of Everyday Visible Blue Light to the Mood and Eyes of Humans**
Aitsebaomo
- 3:30pm **Spiritual Change Readiness: A Critical Review**
Mercer
- 3:55pm **Results of the 2014 Society of Information Management IT Trend Study**
Kappelman, McLean, Johnson, Gerhart
- 4:20pm **Rupturing the Familial: Social Ties and Gender Performance**
Gómez

Thursday, February 26, 2015

- 12:00pm **Welcome**
Kevin B. Vichcales, Ph.D., Associate Provost and Dean, Research and Graduate Studies
- 12:10pm **Fabry's Disease in the Eye**
Kasraie
- 12:35pm **A Bilingual Poem: Learning Experiences of Latina PhD Students**
De La Portilla, Guajardo
- 1:00pm **The Effect of Footwear on Joint Pain in Older Adults with Osteoarthritis: A Systematic Review**
Luna, Wagner
- 1:25pm **Through Their Eyes: Service-Learning for Pre-Professional and Professional School Students**
Schmiedecke Barbieri, Coates, Ibarra
- 1:50pm **M/otherland Palestine: Edward Said's Memoir Out of Place**
Stampfl
- 2:15pm **Impact of Early-Exposure Environmental Education on a Child's Selection of Words**
Fisher
- 2:40pm **A Study of Doctoral Student Learning of Research through Co-Authoring with Faculty**
Blanton, White
- 3:05pm **Solar Power in Rural Peru: A Feasibility Study for Reducing the Use of Polluting Bio-Fuels**
Whittemore
- 3:30pm **Taxation for Inclusive Development**
McGuire
- 3:55pm **Just One More Episode: The Uses & Gratifications of Binge Watching Television**
Krieg

PERFORMING ARTS ABSTRACTS

Ekphrasis: The Art of Artistic Response and Collaboration

Manuel Doria, Nicole Karrody, and Ivonne Ayala, undergraduate students
Joshua Robbins, PhD, MFA, and James Borders, PhD, MFA

Inspiration for Doria’s “Man” came from discussions on gender studies and the idea of overcoming one’s struggles regarding identity. The poem speaks of the frustration which arises when outside forces overwhelm a person’s perception of who they are. “Man” conveys this anger with physical and even violent imagery, highlighting the physical strain of an emotional struggle, shedding light on the turmoil that arises from the experience of manhood and the pressure to maintain an air of masculinity.

Korrody’s ekphrastic response to the poem “Man” began with mind and canvas blank. The first word, the title “Man,” created a male figure who continued to change and transform. His body moved around and twisted as though in agony; his mood and facial dimensions shifted in and out of expressions; his body changed and pulsed from one color to the next. The male figure finally settled and his mood cooled to sadness.

Ayala’s ekphrastic response to the sculpture “Untitled” by Korrody takes the form of a poem, “A Canyon Made of Wood”. Although Karrody’s sculpture is made of a strong material, it stands delicately with a fragile appearance. The sculpture’s form evoked images of canyons, a skeleton, and breasts; emotions incorporated themselves freely. “A Canyon Made of Wood” distills these images and emotions into a blended poetic form, drawing comparison between the erosion of a canyon and the struggle of eating disorders. The poem’s speaker marvels at her own body’s disappearing form, using common, earthy details to draw parallels with the difficult subject.

Banalités, a group of songs by Francis Poulenc

Orit A. Eylon, DMA
William Gokelman, MM on piano

Performance and lecture on Banalités a group of songs by Francis Poulenc, written in 1940. Unlike most song cycles, this work is a group of songs as there are no connections or musical links between any of the songs in this set binding them together, they do create, however, a performance-ready group of songs with a common theme of travel. Poulenc often turned to Apollinaire’s poetry, as they both served in WWI, and always matched his music to the poet’s style. Poulenc could read between the lines of Apollinaire’s poetry and convey the emotion in music and text. Poulenc intended these songs to be appreciated not as abstract modern music but as a complex verbal-musical work of art.

Nocturne and Scherzo

Ken Metz, PhD

Gary Fair, DMA on clarinet and Laura Salfen, MM on flute

This piece explores the dialectic possibilities between the two instruments. The first movement is a nocturne which typically evokes a brooding, enigmatic, almost dark atmosphere. The stage is then set for the Scherzo (which means joke) which provides a lighter and excitingly quirky aspect to the overall work. The piece continues my exploration of composing for clarinet, following up last year's work on Slippery Slopes, which reflected on the musical and metaphorical connection between gesture and meaning.

After Theodicy: Poems

Joshua Robbins, PhD, MFA

Poetry is in trouble. At best, it exists on the margins of American life and only becomes visible during great tragedy as when Yeats's "September 1913" found its way into the email inboxes of indifferent housewives and retirees during the weeks following 9/11. At worst, poetry is irrelevant in public spheres and relegated to university lecterns. Recent poets and critics have written about what is at issue concerning the future of the American lyric poem. The primary ambition of my current project is to write poems which use the lens of theodicy through which to examine injustice and the problem of evil. These poems offer a new framework for the lyric poem—the lyric as theodicy—in an attempt to find new ways to make poetry relevant again.

These poems are from a manuscript titled "After Theodicy," a collection of original poems which respond to various theodicies. I am particularly interested in the ways in which issues of faith and doubt manifest themselves in the rhetorical and formal structures of the contemporary lyric poem. Lyric poetry arises from the human condition and experience of *agon*: the difference between *what-is* and *what-should-be*. In philosophy of religion, theodicy arises from the same liminal space. Strictly defined, "theodicy" is a term created by Gottfried Leibniz who combined the Greek terms *theos*, "god," and *dike*, "righteous," as a technical term for attempts to solve the philosophical problem of evil. Traditionally, the problem of evil has been presented as the following dilemma: If God is all-good, then God must wish to eliminate evil; and if God is omnipotent, God must be able to eliminate evil. And yet, evil exists; therefore God cannot be both all-good and omnipotent.

The poems in this performance represent a variety of my responses to theodicies by, among others, Augustine, Irenaeus, John Hick, and Alvin Plantinga as well as contemporary process theodicy. Primarily developed by David Ray Griffin, this theodicy maintains the position that God is not omnipotent, but is capable of interacting with and influencing a universe God did not create. Since the world and humans were not created *ex nihilo*, the ultimate reality is a process of creativity that is continually ongoing. In process theodicy, everything, every actuality, every moment in time, is imbued with creativity, and therefore to exist is to struggle to create.

The connection between process theodicy and lyric is clear: in the face of an intractable world filled with suffering, poets must struggle to create and respond to this suffering. In fact, poets, particularly Christian poets such as myself, are obligated to respond to injustice because that is poetry's metaphysical and ethical purpose. Although a lyric poem may not be able to end evil in the world, it does participate in a process trying to oppose evil. Process theodicy is a radical departure from the traditionally theological characteristics of God, and in terms of poetry, this theodicy is primarily an aesthetic one which aligns itself well with the creation of lyric poetry, the type of poems presented here.

Two Inventions on a Theme, II. Recitative and Aria after Plath and Hughes

Kevin M. Salfen, PhD

Gary Fair, DMA on clarinet and Laura Salfen, MM on flute

This is the second movement of a two-movement work for flute and clarinet. The first movement is entitled "Canonade" and features various contrapuntal approaches applied to a musical theme. That same theme provides the basic material for "Recitative and Aria after Plath and Hughes." Whereas the first movement of the work (not heard today) tends toward abstraction, the second movement encourages associations, asking the listener to make connections with the world beyond the notes themselves. That a "recitative and aria"—two types of vocal music—should be written for two instruments suggests a lyricism inspired by the human voice and also dramatic, narrative, and specifically operatic models. This suggestion of a wordless drama is heightened by the reference to poets Sylvia Plath and Ted Hughes. At an obvious level, the reference points out a connection between the musical theme of this duet and a song cycle I'm writing that features Plath and Hughes's poetry. But the reference might also suggest the relationship between the two instrumental parts. This doesn't mean that one instrument "equals" Plath and the other Hughes, but instead that the relationship between the two instruments' lines might at times suggest a conversation or relationship between people, with the flute and clarinet frequently shifting roles.

PODIUM PRESENTATION ABSTRACTS

Gender Kaleidoscope: The Feminine Man, the Masculine Woman, the Genderless Human

Ivonne Ayala, English Student

In my Women's and Gender Studies course this Fall I conducted experiential research on gender. The main idea was to experiment on one's own definition of, and what Judith Butler calls the performance of, masculinity and femininity. The methodology for the project included a two week experimentation phase during which time I performed and observed the exaggeration of my feminine and masculine sides. The reactions of people and my own thoughts and feelings were recorded and analyzed.

The rationale of addressing gender lies in the speculation that gender is not constructed but seen as something natural. However, society is seldom aware that we all take part in our gender performance. In his essay "Gender Display" Erving Goffman explains the ways in which we are perceived by others in accordance to the gender we portray as individuals. Every morning we make unconscious decisions on what we wear, what lipstick we use, the color of our tie, etc. Yet, society has limited gender by the establishment of certain expectations; a notable one is color. Blue is the color for boys and pink is for girls, a man has to show masculine characteristics or else will be classified as gay and a woman who is not feminine will be looked at as lesbian.

This paper reflects my changing understanding of gender and ultimately explores the possibility of a genderless society. In the process of this project I have revised my definition of gender, and I now disassociate the word masculine and feminine from men and women. In observing the importance that society places on gender, the thought of being genderless like the baby in Lois Gould "X: A Fabulous Child's Story" was examined. Would it be possible to be genderless, and what would this mean? The ultimate task was to deconstruct the implied ideas of gender that society had placed in my mind since I was a small girl. The concluding findings indicate the importance of recognizing different definitions, the constructed nature, and performance of gender.

Rupturing the Familial: Social Ties and Gender Performance

Leah Mercedes Gómez, English Student

There is a trope rooted in Chicano/a families which defines “gender” as the biologically fixed qualities of “men” and “women.” As a Chicana, I was raised to believe that because I am a “girl” I should behave in a “feminine” way. That is, I should wear dresses and never leave the house without make-up. However, I have come to understand that “gender” or “masculinity” and “femininity” is culturally presupposed. I have adopted Judith Butler’s ideology that gender is a reiterated social performance rather than an expression of reality. Thus, in this project I sought to explore how my own gender performance impacts “me” and those around me.

Throughout the course of two weeks, I manipulated my “gender performance.” For example, I attempted to spend the first seven days of this project without wearing make-up but still maintaining my otherwise “feminine” way of dressing and journaling the responses I received from those around me. For the second week, I reversed “roles.” That is, I dressed in a “masculine” fashion limiting myself to jeans, t-shirts, and collard-button down tops but this time my face was fully armed with make-up.

As I evaluated the reactions I received, I noticed that people in my intimate circle of family and friends were always armed with comments and concerns as I performed “out of character.” As I tried to tease out patterns in my results, I ended up with more questions about the multi-faceted nature of “gender.” I came to the conclusion that in order to change the way the family views “gender,” I need to liberate myself first from the constraints I have internalized from my culture. Most of all, I realized the importance in educating my family on gender politics.

**Feminist Pedagogy in the College Classroom:
An Application of Elisabeth Schussler Fiorenza’s “Wisdom Ways”**

Julie B. Miller, ThD

The work of Elisabeth Schüssler Fiorenza is well-known in the fields of feminist studies in religion. While her work is usually located in the field of biblical studies, it has also been highly influential for the feminist theology and the study of religion more generally. The analyses and theoretical challenges she poses are deep and broad in scope, impacting fundamental issues such as authority, power, and meaning. What I will do in this presentation is to explain how I integrate many of her insights into my college classroom in the course “Introduction to Theology and Ethics.”

In her book *Wisdom Ways: Introducing Feminist Biblical Interpretation*, Schüssler Fiorenza articulates her pedagogical theory and praxis. Fundamentally, she sees feminist teaching as a process of conscientization, or consciousness-raising, which she describes as “the discovery that the personal is political.” (*Wisdom Ways*, 93) The general assumptions underlying Schüssler Fiorenza’s pedagogical model are simple: that “knowledge is publicly available to all who can think and that everyone has something to contribute to knowledge.” (32) The goal of this model of education is to engage students in critical thinking and to help them to see that they can be capable contributors to knowledge-production and action. Ultimately the purpose is not only individual but also communal and even global emancipation.

There is a richness to her pedagogical theory that eludes simple quantification or horizontal analysis as if the process of conscientization moves along a straight path. For this reason, she utilizes the metaphor of dance to describe the complexity of this process. I see five of these steps as particularly relevant for the introductory college religious studies course. They are: 1) Learn to not take the bible literally; 2) Learn to question how we have been taught to read the bible and other patriarchal texts; 3) Develop strategies to overcome roadblocks to conscientization; 4) Develop resistant readers/readings by reflecting critically on personal experience; and 5) Create liberating and emancipatory theologies and actions.

I will demonstrate how I attend to these steps through my use of the two creation stories found in Genesis 1-3. This is a particularly rich text which forces students to recognize that, since these chapters contain two very different creation stories, they cannot be read literally, for both cannot be literally true (step one). Further, by delineating how this text has been interpreted to argue that Eve/woman is responsible for evil and is thus justly subordinate to Adam/man, students learn to discern the rhetorical strategies and ideologies embedded in such texts (step two). Third, students often resist this new knowledge and so strategies must be utilized to address “roadblocks” to their learning, be they an “instinctive” defense of men or a loss of spiritual certainty that leads to emotional angst (step three). Fourth, students must be encouraged to reflect on their own experiences as sources of “truth” in order to help them start “thinking theologically” (step four). And finally, students must be introduced to new, liberating and empowering readings of biblical and traditional texts in order to give them hope and encourage them toward action. In demonstrating how I do this in practice, I hope to encourage others to do so as well.

M/otherland Palestine: Edward Said's Memoir *Out of Place*

Tanja Stampfl, PhD

Edward Said's *Out of Place* serves as an individual and a communal memoir, at once depicting the author's early years and resurrecting a lost homeland: Palestine. By rescuing and recreating lost places, Said carves out his own place in the narrative, a place that allows for change and movement and that constitutes what Helene Cixous in *Rootprints* has called the *entredeux*, the in-between. While the narrative is highly fragmented and characterized by multiple movements between places, the one constant, extending into the present time of the author penning the memoir is his mother, Hilda. Even the idea of this memoir was born when Said, diagnosed with a fatal disease, writes a letter to his dead mother. This letter is the first attempt to establish a new bond with the places of his past. Said thus connects Palestine, his lost homeland, with Hilda, his late mother, to create a what I call m/otherland that envisions an alternate community based on loyalty and belonging and that can be expanded to include the reader. It becomes a utopian meeting ground, a new place to belong.

In understanding the m/otherland it is important to distinguish it from national mother tropes, such as Mother Palestine, which according to Elleke Boehmer reduce actual mothers to shallow stereotypes. The m/otherland I am envisioning here, therefore, is not the same as the Mother Nation, but rather an effort to recreate a history and culture that has been silenced and misunderstood. This m/otherland is at once a very local concept, tied to particular memories and places in time, but carries global implications and applications, especially in response to colonial and imperial oppression. For, when telling this story, Said not only emphasizes a single experience, but *Out of Place* lends voice to the Palestinian Diaspora. Resurrecting a Palestinian identity calls for his involvement with the past, the rectification of the Palestinian image entails an active engagement with the present, and the reconstruction of a Palestinian narrative leads the path into the future.

The m/otherland, however, because it is lost or inaccessible, consists of disparate memories, pieced-together fragments of time and people; it is a cacophony of voices. The challenge in finding and holding on to the m/otherland then is its inherent fragmentation. It is here where the text itself acts as the repository for these disparate voices. Said's journey through time and place is not a solitary adventure, but he takes us, the readers, with him and his memoir is an intersection between writer and reader that exists out of place and out of time. The text is a true meeting point because the narrative does not aim to immerse the reader blindly in Said's childhood but rather highlights both the character's and the author's fragmentation. In its ability to counteract loss and to unify disparate memories, the m/otherland opens up new spaces for thinking and writing about this memoir and about scholarship on mothering.

A Study of Doctoral Student Learning of Research through Co-Authoring with Faculty

Edwin L. Blanton and Lawrence J. White, Doctoral Students

The purpose of our research was to explore the doctoral student experience of learning of research while co-authoring with faculty members. The findings will inform and inspire other doctoral scholars and their supervisors, and will contribute to contemporary discussions of doctoral publication practices (e.g., Aitchison & Lee, 2006; Kamler, 2008; Powell, 2004; Wilson, 2002).

The approach we chose was a qualitative study of the ethnographic perspective. The ethnographic perspective focuses on how social groups and individuals within groups create patterned ways of constructing knowledge, professional and social identities, and ways of being a member of a group. This approach enabled us to examine what happened at particular moments of learning and interaction. We conducted interviews with doctoral students and doctoral faculty members who had co-authored with one another. By interviewing both students and faculty members, we hoped to gain further understanding of both sides of the co-authoring experience. Over a two-week period we developed the interview questions, modifying them several times. After receiving feedback from colleagues, and conducting mock interviews, we arrived with two sets of questions that we believed would lead us to gathering data on how doctoral students learn through the co-authoring process. Some interview questions were asked of all participants, while others were developed specifically for a faculty member or a student. For example, students were asked how and why they decided to co-author with a faculty member; and faculty members were asked how the experience influenced their teaching of research. All four interviews were started with an “around the world” question, as described by Brenner (2006). The purpose of having these broad questions first was that they would prompt further questions to arise which could be followed-upon.

The interviews were conducted individually within a three week period. All interviews were held on-campus with the faculty members being interviewed in their offices and the students being interviewed in a study room in the library. The interviewees signed a consent form after being fully informed of the rationale and goals of the project and were assured of confidentiality, anonymity and the right to leave the research at any point.

All interviews were audio-recorded and then transcribed. The researchers placed their transcripts into Microsoft Excel in an effort to better analyze the included terms, cover terms, domains, and taxonomies (Spradley, 1979). During this process, the following domains emerged: faculty mentoring of doctoral students, working with others, challenges, and learning of participants.

Four main conclusions came from this study. First, it is imperative for doctoral students to learn to write as scholars. Second, proficient scholarly writing can be accomplished through faculty-student co-authorship. Third, students need to take initiative as leaders in shaping their academic self and doctoral development. Finally, co-authorship can transform students to independent scholars.

A Bilingual Poem: Learning Experiences of Latina PhD Students

Ana Maria De La Portilla and Andrea D. Guajardo, Doctoral Students

Despite the population trend indicating that Latinos in the United States will comprise a majority minority by the year 2050 (US Census Bureau, 2010), few Latin American women are pursuing a doctoral degree in research or other advanced degree programs in higher education (Cuádras, 2005; González, Marin, Pérez, Figueroa, Moreno & Navia, 2001; Rodríguez-Chapman, 2012).

The authors conducted a qualitative study using an ethnographic interview technique to examine experiences and events that motivated or influenced four Latina students currently seeking a doctoral degree. The four participants, identified as Latina or Hispanic, have been in the PhD program for at least two years at the time of the interview.

Most literature related to the topic of Latina doctoral research learning approaches the subject from a critical perspective; however, findings from the study indicate that the presence of supportive relationships, adaptability to challenges, and a heightened sense of self-efficacy contributes to long-term success and sustainability in the program. The findings also indicate a transformative learning experience that culminates with the completion of the program.

Spiritual Change Readiness: A Critical Review

Wanita N. Mercer, Doctoral Student

Followers have a role in organizational change and it is important for researchers to consider the role followership has in preparing organizations for change. Followers are the majority members of any organization and carry out the daily tasks of implementing change.

How should organizations and their leaders best prepare followers for change?

Cultural models of change demonstrate the importance of organizations fostering change readiness through the reinforcement of its values and beliefs to the individual follower, thus a need to explore theories of change followership. Workplace spirituality is an organizational culture that creates an environment where employees discover meaning in work, feel a connection with the organization, and ultimately experience self-realization.

This presentation summarizes the findings from a critical review that was recently submitted for publication. The findings of the critical review inspired a three-stage model of spiritual change readiness in which followers are likely to demonstrate change supportive behaviors such as willing to learn and embrace change, adapting to meet the needs of the organization, responding positively to change, and actively participating in transformation. Implications of this research and applications for practice are also discussed.

Fostering an Active-learning Environment by Using Technology to Flip the Classroom

Earl Harmsen, MBA and Scott Roberts PhD

There is a tremendous amount of research that suggests engaging students in an active-learning process enhances their educational experiences. To accomplish this, course instruction needs to have a more student-centered approach. Flipping or inverting the classroom is one way that instructors can achieve these educational goals, without marginalizing the course objectives.

Flipping the classroom requires students to learn course material before they come to class and use in-class time for questions, applications, and evaluation. This more inclusive student role requires a shift in the allocation of time on task and mandates the use of technology in the process. The results are usually an increase in the student's attention, focus and participation. This in turn fosters a higher level of motivation, better communication skills and improves the critical thinking process.

This presentation will examine both the implementation of the flipping pedagogy in a management and marketing course, and the implications of using a variety of technologies to enrich both the students and instructors experience.

Results of the 2014 Society of Information Management IT Trend Study

Leon Kappelman, PhD, University of North Texas, Ephraim McLean, PhD, Georgia State University, Vess Johnson, PhD, and Natalie Gerhart, Doctoral Student, University of North Texas

The Society of Information Management (SIM) is an organization of over 5,000 CIO's and IT professionals from around the nation working in a wide range of industries. For the past two decades SIM has sponsored the SIM IT trend study. This study provides important information insight to practitioners with respect to the current state of IT and future trends. For researchers, the study has consistently highlighted areas where academic research is needed.

The 2014 survey focused on six main areas: IT management key issues and concerns, largest and most important technology investments, structure of the IT organization, role of the CIO, budget and staffing trends, IT delivery trends, CIO reporting relationships, time allocation, background, tenure, and performance measures, and skills needed for the success of CIO's, mid-level IT professionals, and new hires. The survey was developed using a Delphi method working with the SIM Enterprise Architecture Working Group.

The final survey was sent to over 5000 SIM members. 1002 responses were collected. Over 400 CIOs and 700 unique organizations were represented.

Findings indicate that organizations continue to invest in IT to improve operations, reduce costs, and enable business strategies. IT budgets, hiring, and salaries are modestly increasing and back to pre-2008 levels. However, the outlook for 2015 is mixed. Overall, the Study finds that IT is becoming more strategic and business-focused. CIO's and IT leaders are spending more of their time working with upper level business management on strategic issues that impact the business as a whole.

Taxation for Inclusive Development

Michael McGuire, PhD

Latin America has long suffered extreme poverty and inequality, but there is a solution. The Basic Needs Approach to Development seeks to integrate the disenfranchised into the development process by satisfying the basic needs of the poor that enhance their productivity. This generates the opportunity to participate more fully into the production process and to earn incomes necessary to emerge from poverty.

Governments inevitably play a major role in satisfying key basic needs of the poor such as education, health services, potable water, sanitation, and housing. Satisfying these needs requires revenue. Revenue implies taxation.

What is the best form of taxation? The issue is hotly debated in the economic community. Some argue that the tax system should be progressive, i.e., one in which the wealthy pay a relatively large share of their income.

Others claim that progressive taxation is impractical in Latin America: the politically powerful obstruct it, and administrative capacity is too weak to implement it. Consequently, reality calls for emphasizing regressive sales taxes that fall relatively heavily on the poor to raise revenues, and then spending the revenues to satisfy basic needs. According to the World Bank, the regressive sales tax approach is the “consensus” of development economists.

Regressive taxation inevitably slows the satisfaction of basic needs and the implementation of an inclusive development process. It takes with one hand and gives with the other. It delays the satisfaction of basic needs indefinitely.

The ultimate aim of this research is to provide an empirical test of the tax system that best satisfies basic needs. Regression analysis on panel data for 14 Latin American countries indicates that progressive – not regressive – taxation is far more effective in satisfying basic needs and implementing an inclusive development process. This update tackles issues in the “consensus” tax program and suggests practical ways to increase tax progressivity that are both effective and fall within the “consensus” tax policy of development economists.

Impact of Educational Interventions on Nurse Self-Efficacy in Evidence Based Practice Implementation

Jean Dols, PhD, RN, NEA-BC, FACHE, Sara Kolb, PhD, RN, and
Michelle DeStefano, RN, BSN, MPA, NEA-BC, CNO, Methodist Specialty and Transplant Hospital

This study of RNs employed by a faith-based hospital system in Texas explores whether the barriers to implementing evidence based practice can be reduced by educational intervention. Two major barriers to evidence based practice (EBP) implementation by nurses are nurses' weak beliefs about the value of EBP and a lack of nurses' confidence in their ability to implement EBP. As these are characteristics that may be influenced, this study evaluated two educational interventions to determine if one or both are effective in strengthening nurses' beliefs about EBP and their confidence in their own ability to implement EBP.

EBP is the concise and judicious use of current 'best' evidence in the care of patients and the delivery of services. EBP leads to high quality care and best patient outcomes through the use of the best evidence available, clinician expertise, and patient preference. Where research is designed to generate new knowledge, EBP is designed to change practice to utilize the 'best' evidence using clinician expertise and considering patient preferences. While numerous barriers to the implementation of EBP have been identified, two of the major impediments are nurses' weak beliefs about the value of EBP and a lack of nurses' confidence in their ability to implement EBP. A nurse's belief in their capability to use research and practice EBP is an individual characteristic that may be influenced. Self-efficacy, the concept described by nurses confidence level and beliefs, has been shown to be altered by educational interventions.

Seventeen RNs participated in the study with 7 RNs in the comparison (education only) group and 10 in the experimental group. The experimental group's median scores increased on the EBP Beliefs Scale from a pre-survey score of 57 to post formal education intervention and post unit specific education intervention with mentoring survey scores of 67 and 67.5. The control group's median scores decreased from a pre-survey score of 65 to a post formal education intervention survey score of 63. The experimental group's median scores increased on the EBP Implementation Scale measuring the implementation frequency from a pre-survey score of 10.5 to a post formal education intervention score of 15 and post unit specific education with group mentoring score of 22. The control group's median scores on the EBP Implementation Scale decreased from a pre-survey score of 15 to a post formal education intervention score of 12. The results demonstrate that the formal education followed by unit-specific education accompanied with mentoring improve beliefs related to EBP and the ability to implement EBP. The change in scores for the comparison group may reflect over-inflated initial scores possibly related to an incomplete understanding of EBP on the pretest scores. The sample size was small and the differences in the comparison and experimental groups (age, length of time out of school, and level of education) may limit generalizability of these findings.

Knowledge of effective methods to speed the implementation of evidence-based practice will enable nurse leaders to facilitate improvement of the quality of healthcare provided.

Future studies will focus on the efficacy of these approaches with nurses in non-hospital settings and aspects of evidence-based practice not addressed with this study.

Impact of Early-Exposure Environmental Education on a Child’s Selection of Words

Reid Fisher, EdD, ATC

Environmental education researchers have long identified a connection between formative play experiences in nature settings and pro-environmental behaviors (i.e., career paths) of their subjects later in life. Most studies have been post-hoc retrospective looks that have not had the ability to assess causation.

As more children are removed from free-play wilderness opportunities, some schools are seeking means to create those formative experiences within the educational setting, but research has not been conducted to address the impact that this approach has on developing particular environmental behaviors. This study identifies the impacts that a forest-immersion pre-kindergarten has on the connection of the child with the natural world.

Twenty-seven pre-kindergarten students from two academic programs participated in a quasi-experimental study in which they responded to age-appropriate divergent-thinking tasks. Measures of fluency, flexibility, originality, and creativity were compared. Parents completed a survey containing open-ended questions and a 5-point Likert-scaled instrument on ecological perceptions.

A significant difference was found between the two groups. The forest-immersion group used more nature-based words in their ideations, which reflects a cognitive impact stemming from their educational environment. Despite both programs employing a Reggio Emilia-inspired teaching philosophy, the students in the forest-immersion program expressed greater numbers of ideations and higher creativity scores as well. Forest-immersion programs used in early-childhood education have the potential to impact the cognition of the child as reflected in language use.

Subsequent studies need to be conducted to follow these children as they progress through their education to identify lasting impacts that may arise in the form of pro-environmental behaviors.

Harmful Effect of Everyday Visible Blue Light to the Mood and Eyes of Humans

A. Philip Aitsebaomo, OD, PhD

To classify the visible light spectrum generated by household Light Emitting Diode (LED) and electronic tablets such as the iPad, in order to estimate potential damage of these light sources to the eye and the physical well-being of humans. The study will also explore ways to prevent the damaging effect of these light sources.

There is a shift from incandescent and fluorescent lighting to LEDs in most homes. This change is fueled by the fact that LED use result in reduced utility bill as they consume very little power. Additionally, LED bulbs last much longer than traditional lights. However, LED bulbs emit more energy in the near-blue spectrum than other light sources. Ultra Violet (UV) light, including visible blue light, has been implicated in the development of Age Related Macular Degeneration (AMD) and other debilitating diseases in humans. The amount of light entering the eye depends on several factors, including pupil size. We know that pupil size is largest in infants and gradually decreases with age. With the increased use of LED lights at home, humans are now being subjected to excessive blue light at an early age. It is no secret that young people are very dependent on handheld electronic devices that emit blue light. It stands to reason that there is an increased risk of AMD and disruption of circadian rhythm, both of which have been shown to be related to UV and blue light exposure. If we could prevent the harmful rays from reaching the eye, it might be possible to mitigate the harmful effect of visible blue light.

Blue light has been shown to contribute to development of AMD, a disease that has little or no treatment, and is one of the most common causes of blindness in the United States. Ultraviolet light, as well as blue light, has also been shown to affect the rhythmic production Melatonin, a hormone that is responsible for regulating sleep pattern in mammals. If sleep pattern is disrupted, humans can experience severe debilitating mood swing. It is therefore necessary to explore ways to reduce the amount of UV and blue light that reach the eye.

It appears that we can reduce the amount of UV and blue light that enters the eyes by adding blue light filters to eye glasses.

Fabry's Disease in the Eye

Narges Kasraie, OD, FAAO, Diplomate of the American Board of Optometry

Vortex keratopathy or corneal verticillata is also known as whorl keratopathy. It is considered a corneal condition in which characteristic faint golden brown or grayish-white whorl-like deposits may form on the cornea. There are various factors that have been linked to the formation of these corneal deposits, including the intake of certain systemic medications, plus a known systemic disease called Fabry's disease.

Fabry's disease is considered an X-linked genetic disorder in which the body lacks the ability to break down certain fat molecules, leading to a buildup of fat molecules in lysosomes in various cells throughout the body. This buildup leads to potentially life-threatening conditions.

In this presentation, a sort introduction will be given on these corneal changes, some of the systemic medications which are known to lead to their formation, and a detailed discussion of the Fabry's disease itself.

Since certain ocular findings may be the only, or one of the earliest, signs of this disorder, Fabry's disease's associated ocular and systematic manifestations, which can be used by health care providers to rule out the presence or make earlier diagnosis of this life-threatening disease in patients who present with corneal changes, will be discussed.

Through Their Eyes: Service-Learning for Pre-Professional and Professional School Students

Stephanie Schmiedecke Barbieri, OD, FAAO, Russell Coates, OD, and Jessica Ibarra, PhD

Service-learning is an instructional strategy that allows students the opportunity to practice critical thinking skills and apply learning in real-world settings, while meeting authentic needs in the community. At the University of the Incarnate Word, service-learning is linked to the school's mission. Three professors took that mission statement to heart and worked to develop service-learning opportunities for communities locally, nationally, and internationally, incorporating optometry interns and undergraduate biology students.

Faculty developed unique programs to promote service-learning on a local, national, and international level. Locally, the program involved building and operating a low vision clinic. Nationally, the program coordinated and conducted science outreach. Internationally, the program offered vision services in Sierra Leone, Africa. Meaningful effects of service-learning on the participants were documented through personal reflections in oral presentations, self-portrait drawings, and personal writings.

On the local level, interns who served the blind and visually impaired on San Antonio's Southside at the San Antonio Lighthouse for the Blind were given surveys at the end of their rotation. Responses included that they didn't realize that optometrists could help people with permanent vision loss that cannot be treated with glasses or surgery. Some even decided to continue their optometric education by pursuing a residency in low vision rehabilitation, which is currently an underserved area in the optometric field.

On the national level, prior to the PhUn week event, teachers collected drawings done by K-12 students of scientists to capture student's perception based on their social, cultural, and educational influences. In response, K-12 students drew the stereotypical mad scientist: older male, crazy hair, and wearing glasses and a lab coat. After PhUn week, K-12 students drew a scientist again, but this time drew "themselves" as the scientist.

From the international optometry mission trip to Sierra Leone, Africa, students shared that the experience changed their career plans upon graduation to include more mission outreach. It motivated them to encourage their classmates to participate in mission trips, even if these trips were short.

It is the opinion of the authors that student learning was enhanced through these service-learning projects. Moreover, the core values of the University's mission were also met. From inspiring K-12 students to consider science as a potential career, to motivating a future doctor to dedicate their career to the blind and visually impaired or to serve the community internationally, developing exposure to service-learning opportunities was impactful.

Future study of this topic area will include quantitative data to document whether program and program goals were met and examining measures to increase involvement and support for these qualitatively proven outcomes.

14-3-3 and the Finding of Therapeutic Treatments

Chloe Rae Mesa, Biology Student and
Paolo Casali, MD, University of Texas Health Science Center at San Antonio

In our research, we are observing mechanisms of antibody and autoantibody responses based upon somatic hypermutation and class switch DNA recombination of immunoglobins of B cells.

14-3-3 is a class of abundant proteins expressed in all eukaryotic cells. 14-3-3 is significant because it is involved in cell cycle, cell proliferation, differentiation, DNA repair, and survival. In our previous studies, 14-3-3 proteins have been implicated in B-cell class switch DNA recombination (CSR) and antibody maturation. 14-3-3 proteins associate with a highly mutagenic enzyme, activation induced cytidine deaminase (AID) which targets switch regions on the *IgH* locus to create deoxyCytidine to deoxyUracil mismatches, allowing for the generation of double-stranded breaks in the switch regions. Resolution of these double stranded breaks results in the recombination of the constant exon clusters which encode for the five classes of antibodies, therefore diversifying the biological effector function of the secreted antibody.

The mice used in this study are transgenic with two isoforms of 14-3-3 knocked out: 14-3-3 γ and 14-3-3 σ . Polymerase chain reaction is used to amplify specific DNA sequences to determine mouse genotype.

After a 96-hour stimulation of B-cells *in vitro* with primary and secondary stimuli, CSR will be quantified using Fluorescent Assisted Cell Sorting (FACS) in which cell markers (B-cell receptors) are labeled with a fluorophore-conjugated antibody and processed through a flow cytometer. CSR is hypothesized to be impaired when 14-3-3 proteins (specifically 14-3-3 γ and 14-3-3 σ) are knocked out in mice.

This study will elucidate the role of these two isoforms in B-cell CSR, potentially identifying the specificity of these isoforms to CSR and suggesting a structural specificity for their function in immunity and potentially autoimmunity.

Enforced Expression of Rad52 by Retroviral Transduction Decreases Class Switch DNA Recombination

Justin Guerrero, Biology Student, Connie Tat, PhD, University of California at Irvine,
Julia Taylor, University of Texas Health Science Center at San Antonio (UTHSCSA),
Ken Hayama, University of California at Irvine, Zan Hong, PhD, UTHSCSA, and Paolo Casali, MD, UTHSCSA

Systemic lupus erythematosus (SLE) is an autoimmune disease derived from pathogenic autoantibody production along with B-cell hyperactivity and impaired B-cell homeostasis. SLE is characterized by high affinity anti-dsDNA IgG antibodies, which are mutated and class switched from IgM in naïve B-Cells. Our experiments have shown that class switching by DNA recombination and gene somatic hyper-mutation (SMH) are central to autoimmune persistence and greatly up-regulated in SLE mouse models.

Class switch DNA recombination (CSR) is a process of immune system antibody maturation required for a dynamic response to diverse stimuli and antigens. This process diversifies germline immunoglobulin heavy chain exon clusters and is initiated by activation-induced cytidine deaminase's (AID) ability to generate double stranded DNA breaks (DSBs) at specific switch-regions (S-regions) for recombination. Recombinant isotype transcripts are formed after non-homologous DSB resolution of S-S regions mediated by a Ku70/Ku86 heterodimer complex. Rad52 is an important member of the DSB repair machinery, and when deficient, significantly elevates CSR in vitro and in vivo. Contrarily, forced expression of Rad52 has been shown to impair CSR. Our experiments have shown that increased CSR in Rad52^{-/-} B-cells is due to opportunistic recruitment of Ku70/Ku86 complexes to S-region DSB ends. Rad52 can thus compete with Ku70/Ku86 in binding to S regions to resolve AID-mediated DSBs and terminate CSR at reduced levels.

Rad52^{-/-} mouse model splenocytes are harvested, introduced to diverse stimuli that initiate CSR, incubated for proliferation for four days, and examined by flow cytometry. Overexpression of Ku70/80 by retroviral transduction will be performed as well as treatment and assessment of the autoantibody response when treated with NAD, an HDAC inhibitor in the mouse model

Our experiments have shown that increased CSR in Rad52^{-/-} B-cells is due to opportunistic recruitment of Ku70/Ku86 complexes to S-region DSB ends. Rad52 can thus compete with Ku70/Ku86 in binding to S regions to resolve AID-mediated DSBs and terminate CSR at reduced levels.

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Solar Power in Rural Peru: A Feasibility Study for Reducing the Use of Polluting Bio-Fuels

Alison Whittimore, PhD

My research focus is sustainability, with a specific emphasis on solar energy. I oversaw the design of the LEED Platinum UIW Solar House, which is used as a research lab for the Senior Engineering Capstone.

In July 2014, I traveled to Peru with the Women’s Global Connection to study the feasibility of using solar powered devices in rural areas. I presented workshops on the use of solar energy to engineering students at the Universidad Nacional del Santa and to the Pushaq Warmi, “Guiding Women”, a group of WGC partners. Many of these partners do not have easy access to electricity in their homes. It is a common practice to “jump” a wire from public electrical lines, a dangerous and illegal practice. There is no electricity at all in the isolated community of Costa Blanca, and local families use expensive propane and polluting bio-fuels such as wood and kerosene for cooking and lighting needs. While solar devices cannot entirely replace the need for bio-fuels, e.g., cooking and heating at night and during inclement weather, they can replace a significant percentage of costly fuels with the free power of the sun.

On a sunny June day here in San Antonio, I built a solar stove created out of cardboard and reflective material (the inside of potato chip bags). Beginning at 12 noon, I used the stove to heat a large pot of water from 70°F to 180°F in less than 2 hours. This high temperature easily allows the slow cooking of vegetables or stew, much like in a crock pot. In Costa Blanca, I gave a demonstration of how to construct the same stove using local materials. My plan was to recreate the San Antonio experiment there. The conditions were not ideal for the experiment; the local residents had an elaborate reception waiting for us and we did quite a bit of socializing at the expense of formal technical protocols. I was not able to begin heating the water until 3:30 pm, well after the most intense sun of the day. However, the cardboard and foil stove heated a pot of water from 70°F to 118°F in 45 minutes. I am certain our results would have been similar to the results in San Antonio if we had performed the test in the middle of the day. Students from UNS were at the demonstration, and they promised to recreate the experiment at an earlier time of day. The residents of Costa Blanca were very enthusiastic about the solar stoves and the potential of using solar energy and free materials to heat their food. I hope to get an update from them to see if they are building and using the stoves.

In this UIW Research week presentation, I will discuss solar stoves and the public presentations at UNS and at the isolated Costa Blanca settlement. I will also give a live demonstration on how to build a solar stove with a cardboard box, potato chip bags, and some tape.

Just One More Episode: The Uses & Gratifications of Binge Watching Television

Kimberly Krieg, Communication Arts Masters Student

Subscription-based streaming platforms such as Netflix, Hulu and Amazon Prime alter the way in which audiences consume television series. In recent years, more and more people admit to binge watching television programs through online streaming website such as these. This exploratory study aims to identify the demographic characteristics of a binge viewer and evaluate how availability of a diverse amount of technology devices, accessibility to vast amount of content, and parasocial relationships impact on individuals binge watching behaviors. The researcher utilizes a uses and gratification (U&G) theory approach to provide a framework in which one can assess how viewers engage in binge watching television, and the needs it satisfies.

The specific phenomenon of binge watching television series on subscription-based streaming platforms such as Netflix, Hulu and Amazon Prime, although under studied by scholars, continues to penetrate American culture, and the way in which we view television. Companies like Netflix, Hulu and Amazon Prime utilize a consumer-friendly “all-you-can-stream subscription model,” where the consumer pays a monthly fee enabling them to stream as much content as desired. The term binge watching provides a number of definitions. For the purposes of this study, the researcher defines binge as overindulging in an activity to the point of excess. Binge watching more specifically describes when a person views three or more, 20-30 minute episodes in one sitting, or two or more, 45-90 minutes episodes at one time.

Previous scholarly research on the specific topic of binge watching proves limited, however ample research on the uses and gratifications of television viewing, prolonged television viewing, technology and content accessibility, and parasocial relationships allows for relevant assessment. The present study investigates the effect of several factors – including the ease of accessibility to internet-connecting technology devices, abundance of television series content and parasocial relationships – on binge watching individuals that utilize subscription-based services such as Netflix, Hulu and Amazon Prime.

A Model of Wellness Assessments and Recommendations to Promote Refugee Health and Community Integration

Kelly Barr, Hope Olexa, Dion Ruiz, Marie Gilada, Denisa Lopez, Tiffany Whitaker, Faith Rosales,
Martin Nguyen, and Matthew Rivas, DPT Students
Jaime Gonzales, PT, DPT, OCS, SCS and Jason Denton, PT, DPT, MS

The United States offers asylum to individuals from countries around the world who have suffered persecution or fear that they will suffer persecution. Refugees are relocated to new contexts in which they initially possess less social capital, transition to new roles, and are at risk of potential disruptions of their health. Health and social risks include: hypertension, diabetes, depression, general deconditioning, social isolation, and unemployment.

The purpose of this study was to describe the implementation and outcomes of a Wellness Assessment project designed to serve the refugee population of San Antonio. In partnership with Catholic Charities, Archdiocese of San Antonio Refugee Services program, 52 UIW DPT students performed Wellness Assessments of local refugees. Students spent 3-4 total hours with refugee clients over two contacts. During the 1st contact UIW DPT students in groups of 2-4 performed Wellness Assessments including examination of: health behaviors and beliefs, medical history, wellness dimensions, depression screens, vital signs, and physical performance measures. After concluding the 1st meeting students developed recommendations with an emphasis on integrating wellness behaviors into their clients' new social environments. During the 2nd contact students performed client education to facilitate integration of wellness behaviors into their clients' lives.

During the presentation a programmatic summary will be provided complimented by student narratives and case examples. Refugee participants included individuals from Iraq, Iran, Sudan, Malaysia, and Bhutan. Recommended interventions included smoking cessation, aerobic exercise, dietary adaptations including identification of affordable food sources, identification of community and religious organizations for social integration and spiritual wellness, and preliminary steps for employment.

Health needs were identified which required referral to an additional health provider and recommendations were made and communicated to associated case workers. These needs included access to medications, depression care, cardiovascular disease risk, orthopedic care including back, knee, and shoulder pathologies.

The Texas Physical Therapy Practice Act does not allow for unfettered direct access and as a result physical therapists are not able to treat individuals for conditions which are currently symptomatic without a physician referral. While physical therapists are ideally prepared to advise a client about how to treat conditions such as knee osteoarthritis, shoulder pathology, and low back pain, collaboration with an allopathic or osteopathic medical program or provider is required to perform that level of care. Future efforts to improve local refugee health would likely be enhanced through collaboration with Nursing, Pharmacy, and Medical students and faculty. Given the mission of UIW and the existing and developing health professions programs, we as a University may be optimally positioned to serve local refugees through interdisciplinary student volunteer Wellness Assessments.

The Effect of Footwear on Joint Pain in Older Adults with Osteoarthritis: A Systematic Review

Sarah Luna, PT, DPT, GCS and Amy Wagner, PT, DPT, GCS

According to the Centers for Disease Control and Prevention, 52.5 million adults in the US reported being diagnosed with arthritis by a physician, and this is estimated to increase to 67 million by the year 2030. At last estimate, the total cost associated with arthritis and other rheumatic conditions is \$128 billion per year. Osteoarthritis (OA) is a common condition among older adults, and in view of an aging population, conservative (non-surgical) lower-cost management options warrant further investigation. The purpose of this systematic review of the literature was to extract reported effects of footwear, including shoe inserts, for reducing lower extremity (knee and foot) joint pain and improving function and gait in older adults with osteoarthritis.

The CINAHL, SPORTdiscus, PubMed, RECAL, and Web of Knowledge databases were searched for publications from January 1990 to September 2014 using the terms, “footwear,” “gait”, and “joint pain”. Results were narrowed by the factor “age,” extracting cohorts that were 50 years old or older. Outcomes of interest included measures of pain, comfort, function, or gait. Excluded studies contained reports relating to patients with rheumatoid arthritis, amputation, diabetes, multiple sclerosis, using modified footwear or custom orthotics as well as studies that explored the impact of footwear on balance or falls only. Single case studies, qualitative narrative descriptions, or expert opinions were also excluded from this analysis.

Seven studies fulfilled the inclusion criteria. The following results were observed in individuals with osteoarthritis (OA): (1) two randomized controlled trials with small sample sizes and one quasi-experimental study reported lateral wedge insoles may have some pain relieving effects at 4 weeks to 3 months follow-up, but a randomized controlled trial with a large sample size reported that lateral wedges provided no knee pain relief compared with flat insoles when worn for 12 months; (2) hardness of shoe soles was not reported to significantly affect joint comfort in the foot in a quasi-experimental study; (3) a quasi-experimental design investigating shock absorbing insoles showed reduction in knee joint pain with 1 month of wear; (4) a cross-sectional prognostic study indicated poor footwear at early ages exhibits an association with hindfoot pain later in life.

Due to the limited number of randomized controlled trials with a large sample sizes, it is not possible to make a definitive conclusion about the long term effects of footwear on pain caused by OA. There is mounting evidence that type of footwear worn early in life may prevent lower extremity joint pain in older adults, including shock absorbing insoles and avoidance of high heels and sandals, but there is no conclusive evidence that lateral wedge insoles will provide long-term relief from knee joint pain in older adults with OA. More randomized controlled trials are needed to study the effectiveness of footwear on joint pain and function in older adults who have osteoarthritis.

POSTER PRESENTATION ABSTRACTS

Effect of Ratemyprofessors.com and University-Administered Student Evaluations of Teaching on Professors' Self-Efficacy

Stefanie S. Boswell, PhD, Danielle R. DeLuna, Psychology And Criminal Justice Student,
Antoinette King, Psychology Student, and Asia Aguirre, Psychology Student

This project investigated effects of student evaluation type (Ratemyprofessors.com [RMP] vs. university-administered student evaluations of teaching [UASET]) and evaluation valence (positive commentary vs. negative commentary) on professors' teaching self-efficacy (SE) for an upcoming course. A type by valence interaction was hypothesized; professors would report the highest SE after exposure to positive UASET commentary and the lowest SE after exposure to negative UASET commentary.

On RMP, students anonymously rate instructors on easiness, clarity, and helpfulness; they also 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. No extant literature has investigated the effect of evaluation type (RMP/UASET) and valence (positive/negative) on professors' expectations about teaching. This study sought to address that gap in the literature.

Recruitment emails were sent to 822 randomly selected instructors at American universities. Respondents ($n=125$) participated via SurveyMonkey.com; they were randomly assigned to one of four experimental conditions: 1) RMP positive, 2) RMP negative, 3) UASET positive, or 4) UASET negative. All participants read five evaluative comments and imagined that they were the teacher being evaluated as they answered questions about SE. UASET condition participants were informed the comments originated from UASET; RMP participants were told they originated from RMP. Negative condition participants read negatively worded statements (e.g., "You will learn absolutely nothing"); positive condition participants read positively worded statements (e.g., "Explains everything really well"). Participants utilized 9-point, Likert-type scales to rate their SE for tasks associated with teaching; they rated 8 items using a scale created by the primary researcher for this study ($\alpha=.97$). They also answered questions about how seriously they consider RMP and UASET comments when making choices about teaching and how accurate they consider each type of commentary to be.

Participants reported that they consider UASET results to be more accurate than RMP ($t=12.21, p<.001$) and take UASET feedback more seriously than RMP feedback ($t=19.93, p<.001$) when making decisions about how to teach courses. Despite their report that they consider UASET to be more serious and accurate, participants did not discriminate between UASET and RMP commentary in the experimental manipulation. Multivariate analysis of variance (MANOVA) revealed no effect of evaluation type on SE or an evaluation type by valence interaction. Only commentary valence affected SE, $F(8,115)=17.73, p<.001$. Follow-up univariate analysis of variance found that valence had a significant effect on each SE question; those who saw positive evaluation commentary reported higher SE than those who saw negative commentary.

“Hotness,” Rating Volume, and Students’ Perceptions of Professors

Stefanie S. Boswell, PhD, Antoinette King, Psychology Student, and
Danielle R. Deluna, Psychology and Criminal Justice Student

This study manipulated professor “hotness” (chili pepper icon/no chili pepper icon) and rating volume (high volume, several ratings/low volume, few ratings) on fictitious Ratemyprofessors.com (RMP) profiles to investigate their effect on student cognition.

On RMP, students rate professors on easiness, clarity, and helpfulness. Students also rate instructors as either attractive (*hot*; denoted by a chili pepper icon) or unattractive (*not hot*) (RMP, 2014). Physically attractive professors receive higher overall student ratings than their unattractive counterparts (Riniolo et al., 2006). Moreover, Freng and Webber (2009) found that attractiveness (presence of the chili pepper icon) uniquely explained 8% of RMP quality rating variance. Volume, or number of ratings, may also affect students’ attitudes toward professors. Li and Wang (2013) found that rating volume interacted with rating valence to affect students’ attitudes toward a fictitious professor; students exposed to a high volume of positive information reported the most favorable attitudes toward a fictitious professor when compared to those exposed to high volume of negative information or a low volume of either positive or negative information.

Undergraduates ($n = 73$, 81% female) viewed the RMP profile of one fictitious professor. Attractive/“hot” professors showed a chili pepper icon; unattractive/“not hot” professors showed no chili pepper icon. Rating volume was manipulated through the number of ratings shown for the professor. High volume profiles showed that 33 ratings were made; low volume profiles showed that three ratings had been made. Participants were randomly assigned to one of four profiles: 1)chili/high volume, 2)chili, low volume, 3)no chili/high volume, or 4)no chili/low volume (see Appendix for profiles). To control for effect of helpfulness, clarity, and easiness, ratings for these variables were held constant and rated in RMP’s *average quality* category (ratings: 2.5-3.4) (RMP, 2014). After viewing the manipulated profile, participants used 9-point, Likert-type scales (1 = *low*, 9 = *high*) to rate intention to take the professor’s course, participate in the professor’s course, and ask for help from the professor. They also rated their beliefs that they would earn an A and “learn a lot” in the professor’s class. They completed a demographic questionnaire.

A mixed-model multivariate analysis of variance found no multivariate effect for hotness, volume, or hotness by volume interaction. Participants did not vary their ratings, regardless of hotness of rating volume. Results were not consistent with previous findings about professor attractiveness and volume of ratings. It is possible that presence of the chili icon may be insufficient to produce an effect for physical attractiveness. A future manipulation could investigate the effect of a description of a fictitious teacher accompanied by a photograph of an *unattractive* or *attractive* face. With regard to volume, it is possible that volume of ratings alone may not be sufficient to effect students’ perceptions. Previous research (Li & Wang, 2013; Scherr et al., 2013) suggests that volume may need to interact with a third variable, valence (positivity or negativity of rating commentary) to produce an effect.

Ratemyprofessors.com versus University Evaluations of Teaching: Effect on Students' Self-Efficacy and Intentions to Invest Effort into a Course

Stefanie S. Boswell, PhD, Antoinette King, Psychology Student, and
Danielle R. DeLuna, Psychology and Criminal Justice Student

This study investigated the effects of student evaluation origin (Ratemyprofessors.com [RMP] vs. university-administered student evaluation of teaching [UASET]) and valence (positive/negative) on undergraduates' self-efficacy for a course using a mixed-model design. Given that students perceive RMP to be of greater validity than UASET (Brown et al., 2009) and are more affected by positive comments, it was hypothesized that participants would show the greatest effect for positively valenced RMP comments.

On RMP, students provide anonymous instructor evaluations. Exposure to ratings similar to RMP affects students' motivation to learn (Edwards & Edwards, 2013) and attitudes about courses (Kowai-Bell et al., 2011; 2012). Moreover, students are affected more by positively valenced comments than negatively valenced comments (Kowai-Bell et al., 2012). Because UASET results are seldom public, students may utilize RMP because they have no alternative information-gathering tool for decision making about instructors (Kindred & Mohammed, 2005). However, if UASET results were available, students may be more influenced by these ratings.

Undergraduates ($n = 75$, 80% female) read a set of positively and negatively valenced evaluative comments (counterbalanced) about a fictitious teacher. Half were informed the comments originated from RMP; half were informed they originated from UASET. After reading each comment set, participants used 9-point, Likert-type scales (1 = *low*, 9 = *high*) to rate six items measuring self-efficacy for the teacher's course (e.g., I will participate in class, ask for help if needed, do well on assignments, do well on exams, earn an A, learn much information) and one item about intention to invest effort into the class. They completed a demographic questionnaire.

A mixed-model multivariate analysis of variance yielded a significant effect for comment valence (negative/positive), $F(7, 67) = 57.22$, $p < .001$, but not origin or origin by valence. Follow-up one-way univariate analyses of variance revealed significant univariate effects ($df 1, 82$) of valence on participants' self-efficacy for participation in the class, soliciting the professors' help if necessary, performing well on assignments and exams, earning an A, and learning a great deal of information in the course; it also affected intention to invest effort into the course (all $p < .001$). Participants provided significantly higher ratings on all variables when comments about the teacher were positive. Descriptive statistics and analyses summary tables will be presented on the poster.

Positive evaluative comments about the teacher affected students' self-efficacy for tasks associated with academic success. These results are consistent with other studies demonstrating an effect of evaluative comments on students' expectations about upcoming courses as well as results supporting that students are most affected by positive evaluative commentary (Kowai-Bell et al., 2011; 2012). Positive evaluative comments also affect students' intentions to invest effort into a course. Given that self-efficacy influences willingness to invest effort into a task (Bandura, 1977), and effort is a strong predictor of academic success (e.g., Larson et al., 2014), these results suggest that exposure to evaluative commentary may have significant consequences for students' academic performance in a course.

Effects of an Active-Learning, Course-Based Instruction of Social Science Research Methodology

Stefanie S. Boswell, PhD, Lisa K. Lockhart, PhD, and
Danielle R. DeLuna, Psychology and Criminal Justice Student

This study used a mixed-model (time: pre-test/post-test; group: experimental/control) quasi-experimental design to investigate the effect of an active-learning, course-based approach to the instruction of social science research methodology on the dependent variables of undergraduates' research self-efficacy (RSE), feelings toward and perceived utility of research, intention to conduct an undergraduate research project, and interest in conducting research later on in one's career. A significant group (experimental/control) by time (pre-test/post-test) interaction on the dependent variables was hypothesized. Specifically, it was hypothesized that the experimental group would report gains in the dependent variables over time; however, the control group would not.

Much of the extant RSE (confidence in one's ability to successfully execute research-related tasks) literature has focused on graduate students; this study explores RSE in a new population, undergraduates.

Engaging students in an experiential approach to research training may improve undergraduates' RSE (Ciarocco et al., 2013). Improving undergraduates' RSE may be one of the best ways to increase their future involvement in scholarship (Love et al., 2007), potentially affecting their attitudes toward research (Lambie & Vaccaro, 2011).

Experimental group participants ($n=36$) completed the semester-long social science research methods course involving didactic and experiential components including a 10-step process for the development of an original research project. Control group participants ($n=36$) were enrolled in social science courses whose foci were not research methodology. On the first and last day of the semester, all participants completed measures of the dependent variables, the RSE Scale (Bieschke et al., 1996), scales assessing feelings toward and perceived utility of research (Sizemore & Lewandowski, 2009), and 7-point, Likert-type ratings of intent to conduct undergraduate research and interest in conducting research in one's career.

Multivariate analysis of variance revealed a significant multivariate group, time, and group by time interaction on the dependent variables. Follow-up univariate analysis of variance revealed a significant time and group by time interactions on RSE; post hoc *t*-tests found that the experimental group's RSE increased more over the semester than the control group. Group affected feelings toward and perceived utility of research. Experimental group participants reported more positive feelings toward and perceived utility of research throughout the study. It is possible that students who enroll in the required Research Methods course are optimistic about the usefulness of the class and the skills that they will obtain in it. The importance of methodology is emphasized early on in our program; perhaps by the time students enroll in the junior-level Research Methods course they are convinced that it will be a beneficial experience. While the experimental and control groups' RSE were statistically equivalent at the beginning of the semester, the experimental group's RSE significantly increased by post-test. It is heartening to know that their sense of RSE increased significantly after their active learning in the course. These findings have implications for the positive effects of experiential learning in the classroom.

Physiological Responses and Devaluation of Alternatives: Differences by Relationship Commitment

Victoria Cooremans, Psychology and Biology Student, Stefanie S. Boswell, PhD, and
Harold Rodinsky, PhD

The purpose of this study is to evaluate the differences in physiological and verbal responses to attractive photos between committed and non-committed individuals. The hypotheses of the current study were 1) Changes from baseline of heart rate, respiration rate, and skin conductance (GSR) will not be significantly different between committed and non-committed (single) individuals, however, 2) Committed individuals will verbally rate the alternatives as significantly less attractive than the single individuals.

Within relationships, commitment is conceptualized as the desire to continue involvement with an individual, despite any temptations that may arise. Temptations arise when an individual is presented with an attractive alternative partner outside of their current relationship. Devaluation occurs when an individual involved in a romantic relationship claims that individuals outside of the relationship are less attractive than they are typically seen to be. Research investigating the relationship between perceived attractiveness and physiological response suggests that there is more to attraction than conscious decision-making (Hughes et al., 2010; Silver & Parente, 2004). Individuals can choose, as they do in devaluing alternatives, to ignore or deny their attraction to an alternative. While devaluing has been demonstrated by individuals involved in committed relationships, the body has automatic physiological responses that may be indicative of an individual's actual response to stimuli no matter their relationship status.

A total of 45 undergraduates, ages 18-23, were recruited from the UIW Honors Program and introductory psychology classes. Participants were shown 6 photos of opposite-sex faces and asked to give a verbal rating ranging from 1 (not at all attractive) to 5 (extremely attractive). In addition, heart rate, respiration rate and skin conductance were recorded as each participant viewed photos of attractive individuals using a pulse transducer, respiratory belt transducer and galvanic skin response (GSR) respectively. Participants' heart rate, respiration, and GSR were allowed to return to baseline after viewing each photo.

A MANOVA tested for physiological differences between single and committed participants; there was no multivariate effect of relationship status on average heart rate, average respiration rate, and average GSR, $F(3,41)=.621$, $p=.61$. Committed and single participants did not vary in their physiological responses to the photo presentations. This supported the first hypothesis that physiological changes from baseline of heart rate, respiration rate, and GSR are not significantly different between committed and single individuals. A one-way ANOVA tested for differences in verbal attractiveness ratings between single and committed participants and found no significant differences, $F(1,43)=1.20$, $p=.28$. Single and committed individuals did not differ in the attractiveness ratings that they verbalized when viewing the photos. These results do not support the second hypothesis that committed individuals rate alternative partners as significantly less attractive than single individuals. Results of this study suggest that individuals respond similarly to attractive alternatives, regardless of relationship status. It is possible that individuals in current generations are more accustomed to expressing their opinions about attractiveness (Rautio, 2009), thus minimizing evidence of devaluation. In addition, physiological responses to attractive photos were recorded in a controlled lab setting which may vary from the physiological responses elicited by personal interaction with attractive individuals.

Integrating Visualization into Higher Education Classes

Mariam Aleide and Basmah Habtar, Adult Education Masters Students

Contemplative practices in education offer alternative ways to approach learning. The significance of contemplative and related disciplines in higher education shows how these disciplines have been formulated as significant tools for imagination and creativity. Committed and creative educators attempt to bring different forms of contemplative practices into classroom. However, applying these practices in higher education requires more innovative insights and theoretical framework. One of these contemplative practices is visualization. Visualization has a powerful impact not only on education but also on personal development as a whole. In educational contexts, the importance of visualization lies in one's ability to visualize the input. Subsequently, this practice promotes learners' awareness of the learning process, which facilitates learning. The study aimed to investigate the literature related to the impact of visualization on education. Findings were utilized to formulate a visualization model that addresses the learners' needs.

The researchers reviewed 23 scholarly journal articles and books. Some of articles focused on a contemplative practice in general, and the significance of such practices in higher education as students in college age make critical decisions in their life. Contemplative practices promote students' awareness and the development of the whole person. However, the main focus of the research is visualization impact on the learning process. The reviewed literature supported the implementation of visualizing techniques into classrooms. Although that this application is highly recommended in applied contexts like engineering and physics, visualization training assists in constructing meanings of abstract concepts and practices. Visualization has a positive influence in promoting students overall learning by assisting in creating meaningful learning. Based on the findings of the reviewed literature, and the 'continuity of the learning' presented in Kolb's experiential learning, a model for visualization is proposed (Figure 1). Since meaningful learning has a significant role in constructing learning, the proposed model emphasized the role of prior knowledge. Another important aspect of the proposed model is considering learners' prior knowledge. Logically, learners cannot visualize the input or output when they lack an adequate knowledge about it. Modeling visualization is essential to the proposed model. Students may benefit from observing a physical representation of visualization to better comprehend the practice.

The reviewed literature indicated a direct link between creativity, meaningful learning and visualization. To fully utilize the visualization technique, learners should be able to engage in each of the stages in Kolb's experiential learning. Concrete experience refers to learners' ability to be fully engaged into the new learning. This will help students to reduce tensions and assumptions, which eventually enable them to concentrate on their senses and enhance creativity as they process the input. The second concept of Kolb's experiential learning is reflective observation. It indicates learners' willingness to reflect on experiences from different point of views. In regard to visualization, students will move from being receptive to knowledge as abstract facts to be able to consider their thoughts by transferring these thoughts into visual representation. It is a stage where they will take an active part of learning. While abstract conceptualization refers to the students' ability to relate their observations to theoretical frameworks. The students reflect on their visualization and process the output to connect it to theories or to abstract facts. This will help students to experience a meaningful learning. The last stage of Kolb's experiential learning is active experimentation where one applies the learning to practice in order to overcome a problem or make a decision. Students will apply the visualization or the mental images to arrive to conclusions and meanings.

Hierarchy of Follower Attributes and Gender Effect in a Corporate Latin-American Culture

Absael Antelo, PhD, Rodrigo A. Zarate, EAN University, and Margaret Sheridan, Trinity College

The purpose of this presentation is to share the results of a study of followership conducted in Colombia. Emphasis is placed on both a hierarchy of followers' attributes and gender effect in this Latin American culture.

Leaders neither exist nor act in a vacuum without followers (Kelley, 2008). This statement underpins the importance of followership in effective organizational leadership. Assessment of followers' attributes is therefore relevant in exploring the interactive nature of the leadership process. Follower attributes may determine how followers or team members participate in natural leadership situations to achieve organizational effectiveness and reach the goals of the organization. To ignore the attributes of followers ought to therefore be deemed Kafkaesque.

A survey research design was utilized to assess the attributes of Colombian employees. Nearly 400 employees were surveyed. The participants are individuals who met the pre-established criteria for selection and are currently working as members of corporate organizations.

A survey research design was utilized to assess the attributes of Colombian employees. Nearly 400 employees were surveyed. The participants are individuals who met the pre-established criteria for selection and are currently working as members of corporate organizations.

Preliminary results reveal that Colombian employees are less flexible when changes in the workplace are introduced. Furthermore, the role played by cultural indicators in the engagement of emotional intelligence is of great significance. High context cultures such as the Latin American culture are typically characterized as having a high attention to the social process first and then to the task at hand. The inability to control and manage their emotions in such a process seems to imply either about a cultural problem or a training need. In addition, the study demonstrates that women ranked high in emotional intelligence and in a focused statistical inspection of the data some interesting differences between genders emerge.

The Role of Mentoring in the Doctoral Students' Learning Process

Erika O. Bowen and Karen Walker, Doctoral Students

The purpose of this study was to explore what role mentoring has on the doctoral students' learning process.

The attrition rate for doctoral students in the United States has been reported as high as 50% (Creighton, Parks, & Creighton, 2008). There is an absence of reliable or comprehensive information examining the doctoral student's relationship with faculty, and what information is available tends to focus on the beginning and end of doctoral study. There is little information discussing what gets the student to degree completion, and very little attention is given to "how" the student learned (Nettle and Millett, 2006). To address this gap, this study examines the doctoral student's relationship with faculty, and peers, through the lens of mentoring, and explores "how" their learning process, as a current student, is unfolding. The role of mentoring was chosen since the lack of mentoring has been cited as one of the most important factors influencing program attrition (Golde, 2000). Additionally, the doctoral process itself is disturbed without mental support, inspiration, and encouragement provided through mentoring (Peura, 2008).

This was a qualitative study using purposeful sampling. Participants selected for this study were UIW School of Education Doctoral Students, who as students, have previously produced scholarly work. Examples of scholarly work included publication, conference presentation, research poster presentation, and research symposium presentation. The researchers felt it important the participants had previously produced scholarly work since mentoring has been shown as a cause of higher mentee research productivity (Paglis, Green, & Bauer, 2006) and "how" they learned to do this was important to the purpose statement. Participants agreed, by self-report, they have experienced mentoring during their academic stay in the UIW Interdisciplinary Doctoral program. In an effort to provide data variability, participants were selected from two of the three Doctoral concentrations. Five students were interviewed. Interview durations ranged between forty-five and sixty minutes. Audio recordings were transcribed by the researchers manually or with Audacity. Spradley's Domain Analysis was used for data analysis.

Much of the data were mentee descriptions of their mentor's way of being; way of doing; and way of communicating. These mentoring ways were always in the context of experiential learning guided by the mentor. The mentee's mentoring experiences have been positive and valued, whether formal or informal. Mentees do recognize peers as mentors and view their peer mentors as a source of validation, verification, and social support. There was a clear expression for more of this type of peer interaction. Mentees expressed confidence in their ability to produce scholarly work because of their mentoring experiences and intend to do more. Mentees believe mentoring was vital to their successful development as scholar. Without it, their education would not have been the same. Conclusion: Mentoring by faculty provided experiential learning for the mentee. Because of these experiences, mentees expressed a sense of self-efficacy in producing scholarly work with an intention to produce more. Peers as mentors were seen as source of support and validation. Mentees desired more peer mentoring experiences. Recommendation: A formal faculty-student mentoring program be established by UIW, and the Doctoral Student Association (DSA) facilitate the development of peer mentoring relationships.

**Award Winning Children’s Literature:
A Comprehensive List of Patterned Books for the Elementary Classroom**

Crystal Frost, Honors Student, Interdisciplinary Studies and Stephanie Grote-Garcia, PhD

Readers who comprehend well use a number of strategies such as activating prior knowledge, generating questions, drawing inferences, creating summaries, and identifying the text structure (NICHD, 2000; Pressley, 2000; Smolkin & Donovan, 2002). In fact, research from the past thirty-five years suggests that comprehension is enhanced when the text is organized into well-known structures (Kintsch, Mandel, & Kozminsky, 1977; Mandler & Johnson, 1977; Thorndyke, 1977). As a result of such findings, authors of children’s literature often arrange the structure of their stories into predictable patterns, such as circles-tales or rhyming text.

Although research has identified that predictable patterns can increase reading comprehension (Gately, 2008), there is not a comprehensive list of predictable patterned books for teachers to use when planning reading instruction for their elementary students. Thus, in the present content analysis we examine over 200 award winning picture books and identify those with predictable patterns. The product of our analysis is a comprehensive list of award winning patterned text, published within the last five years (i.e, 2010-2015). Ideally, this list can assist elementary teachers in selecting high-quality patterned text for reading instruction.

The author may assist the reader with building meaning by creating purposefully crafted conversations that are organized in predictable patterns also known as patterned books. Zipprich, Grace, and Grote-Garcia (2009), remind us that “the idea behind instruction with patterned books is that the hierarchical components represent frames or patterns that readers can use to store information in long-term memory, thus increasing comprehension” (p. 294). These types of texts engage readers on various levels because they “contain a repeated linguistic or story grammar pattern that English language learners or elementary students with learning disabilities in areas of reading can use to support their reading” (Zipprich, Grace, & Grote-Garcia, 2009, p. 294). Patterned books have also been reported to be effective instructional tools for students who are autistic and are often challenged with language and integrated aspects of communication to gain meaning in social situations (Gately, 2008).

Additional research supports the use of patterned books in the elementary classroom. In an evaluation of multiple instructional programs, Williams (2005) suggest that “at risk children in the primary grades can achieve gains in comprehension, including the ability to transfer what they have learned to novel texts, when they are given highly structured and explicit instruction that focuses on text structure” (p. 6). Similar findings are reported in a meta-analysis of strategies used to improve the reading comprehension skills of students with learning disabilities. In the research findings, Sencibaugh (2007) reports that, two important findings emerged from the synthesis: (a) auditory/language dependent strategies have a greater impact on the reading comprehension skills of students with learning disabilities compared to visually dependent strategies and (b) questioning strategies involving self-instruction and paragraph restatements along with text-structure-based strategies yield the most significant outcomes” (p. 6).

In light of all the research supporting the use of patterned children's literature in the classroom, we find it highly important to compose a comprehensive list of the most recent award winning patterned text.

Millennials and Destructive Leadership

Rhonda M. Martin, PhD and Absael Antelo, PhD

The purpose of the interpretive qualitative study was to describe how participants interpreted the consequences of destructive leadership behavior through their lived experiences and perceptions. Their perceptions and lived experiences are emphasized in an effort to describe the meaning-making process millennials engaged in during their interactions with these leaders.

By 2018, 40% of the workforce will be the millennial generation. These future leaders are greatly impacted by destructive leaders who adversely affect their followers. One of the many consequences of destructive leadership is high turnover of employees. It is costing U.S. companies more in the long-term versus removing the destructive leader. The significance of this research provides awareness to those in academia and corporations.

A growing body of literature and research are addressing the issues related to followership behaviors and the ways leaders impact the lives of followers. In this mutual process of relationships, the organizational accomplishment of a common purpose is affected by the quality of the interactions within the leading process.

Given the purpose of this study a qualitative research design was the appropriate choice. The specific interpretive design helped to assess the human experience and how individuals construct meaning in their lives at a particular point in time. (Hesse-Biber, 2010; Merriam, 2002). Thus the study explored the consequences of destructive leadership through the followers' experiences. Data were collected through 10 personal interviews, transcripts analyses, and observations.

Findings were consistent with previous research on susceptible followers such as conformers and bystanders. The followers' perceptions were documented as well as the destructive leaders and the conducive environment. Findings supported the theoretical framework and confirmed that destructive behaviors of a leader are detrimental to and violate the legitimate interest of the follower's role and commitment to the organization. This research also articulates how destructive managerial behaviors adversely impact the life, career choice, approach to ethical dilemmas, levels of trust, and respect expressions of followers about destructive leaders. In consequence, followers do not trust leaders, get involved with unethical behaviors induced by fear, and are losing faith and interest in the organization. We need to educate and mentor millennials on how to be courageous followers. For those in leadership roles today, start educating employees on how to be successful followers who will in turn be great leaders.

An Exploration of the Efficacy of the Use of Explicit Number Names in Preschool and Kindergarten

Suzanne Meche, Doctoral Student and Judith E. Beauford, PhD

The purpose of this quasi-experimental study is to explore the efficacy of preschooler's and kindergartener's use of Mandarin based explicit number names in early childhood numeracy acquisition with a specific focus on acquisition of tens and ones place value concept.

International tests of mathematics have established that children from Mandarin language heritages enter formal education at least two full grade level equivalents ahead of children in the United States. Acquisition of the place value concept is foundational to all subsequent mathematics concepts and has been connected to future success in mathematics. Currently, the U.S. Common Core Mathematics Standards address teaching of place value foundations in kindergarten and first grade. This study demonstrates that these concepts can be readily taught in prekindergarten and reinforced throughout kindergarten, thus accelerating place value acquisition by as much as two years. The kindergarten Common Core standard addressing fundamental concepts of place value, CCSS.Math.Content.K.NBT.A.1, was specifically addressed by this intervention in the prekindergarten classroom. Six first grade Common Core mathematics standards, all addressing place value using tens and ones, were specifically addressed in both the prekindergarten and kindergarten classrooms.

Preschool and kindergarten students at St. Peter Prince of the Apostles School in San Antonio received the intervention from August 2011 through May 2014. Children were taught the eleven vocabulary words (zero through ten) necessary for naming numbers using the explicit number naming system. This is in contrast to the one hundred unique words necessary for the traditional naming system. In the explicit number naming system, numbers and quantities are identified according to their quantity and place value. For example, twenty-seven is named two-ten seven, thus stating the exact quantity and in place value order. Instruction was conducted in English and Spanish and coupled with the use of explicit number names for everyday speech. Monthly visits to the classrooms were conducted in order to develop relationships with the students and teachers, train teachers and aids, and gather feedback from the teachers in order to provide needed supports. Acquisition of numeracy concepts such as rote counting, reading numbers, identifying ones and tens place value and modeling of numbers using tens bundles and ones were assessed at the end of the fall and spring semesters each year.

Assessment results demonstrated that the more experience children had with explicit number names, the better they were able to concretely model numbers using tens and ones with correct place value order. Children who had used explicit number names were able to rote count, identify place value, read numbers using both explicit and traditional names and correctly model numerals using tens bundles and ones units with high rates of accuracy.

First Semester Results of Graduate Students' Perceptions of Preparedness for Creating Research Proposals

David W. Moffett, EdD and Laura L. Varela, Doctoral Student

The study purpose is to measure master's students' perceptions regarding their preparedness for creating research proposals. Research question: Should all students be engaged in research during their undergraduate experiences to ensure all graduate students are prepared to conduct it?

Aguado (2009) noted empirical research is quite different than what students have experienced and understand research to mean. Furthermore, in addition to students' lack of preparedness to conduct research and confusion over what research actually is, some students also have negative perceptions and a high level of anxiety when it comes to the topic of research in general (Carifio & Erikson, 2007). Furthermore, Campbell (2000) revealed that less than 11% of undergraduate programs required students to complete a research methods course.

Based on informal observations and student discussions in several master's level introduction to research courses, the Investigator developed the research question pertaining to many students unpreparedness for creating research proposals. Students expressed frustrations regarding their lack of preparation for conducting research. There is a limited amount of research available examining master's students' perceptions of preparedness to conduct research.

This mixed methods study utilized pretest and posttest questionnaires. Participants quantitatively identified ratings of their perceptions regarding research on a Likert scale, and also provided short answer responses, including a closing open-ended question response. Participants were master's students (n=9) enrolled in Introduction to Educational Research during the 2014 summer semester. The study was conducted at a Division I university located in the southwest United States. Data from open-ended responses were analyzed using word processing software. While, data from Likert scale items were analyzed using descriptive statistics.

First semester study pretest results revealed an average 3.4/10 regarding previous research experience, and a pretest average 5.1/10 regarding perceived preparedness to do research. Several participants' start of class scores supported literature regarding many undergraduates not having prior research experience. Pretest to posttest significant gains occurred in perceptions of preparation of planning and conducting research, along with perceived ability to conduct research. However, female participants' pretest and posttest scores were lower than males regarding perception of research success. There were also differences across races regarding perceived success. Written responses supported the quantitative results.

As hypothesized, some students perceive they are not adequately prepared for planning and conducting research, when entering the graduate level introduction to education course, while others perceive they are prepared.

More research is needed regarding gender and race differences, how much prior research planning experience students have had, how prepared students feel to plan and conduct research, how successful their research planning experience was in the course, and how prepared students feel to conduct future research.

Learning through Collaborative Writing in Doctoral Education: Student Perspectives

Jessica Rangel, Denise K. Ramon, and Lisa R. Rodriguez, Doctoral Students

A professor and three Ph.D. students who worked collaboratively on writing a chapter for publication present how their understandings of qualitative research were transformed through the writing. Our research skills, novice to advanced, grew as we drafted, gathered information, analyzed, discussed, and wrote on qualitative perspectives in classroom discourse and interaction research. We are preparing to share our perspectives on learning through collaborative writing among doctoral students and experience working with faculty. This study on collaborative writing stems from approaches to participatory inquiry in which researchers are participants studying their practice (Cochran-Smith & Donnell, 2006). The study is also guided by an ethnographic perspective which seeks to make visible what is often invisible to insiders while the insiders go about their daily life and work (Delamont, 2008; Green, Dixon, & Zaharlick, 2003). Through reflexive analyses (Lichtman, 2013) of the processes of collaborative writing we demonstrate what was accomplished during the writing and what became visible in post-hoc reflexive analyses.

The study draws on two bodies of work. The first is work on doctoral education that calls for understanding processes through which doctoral students develop as scholars and stewards of their disciplines (Walker, Golde, Jones, Bueschel, & Hutchins, 2008). The notion of stewardship requires that students are capable of generating, conserving, and transforming knowledge (Golde, 2006). These capacities develop through academic socialization (Duff, 2010) and collaborative work (Garbati & Samuels, 2013; Storch, 2011; Swartz & Triscari, 2011). The second theoretical perspective calls for understanding writing and language as social and historical phenomena in which no text is truly a text by a single author (Ede & Lunsford, 1990) since all words have histories and texts develop in and through human interaction with other texts, histories, and each other (Bakhtin, 1979/1986; Bazerman, 2006).

Data sources include documents created during the collaborative writing process as well as the reflections on the learning written after the chapter was submitted for publication. Data include personal notebooks, printed analysis documents (including paper strips, post-its, spreadsheets), and all writing resources stored on in a shared google drive folder. The shared documents included literature review logs, literature used for writing, notes of tasks, and all drafts of the writing-in-progress.

Three primary areas of learning became visible through our analyses of the processes and outcomes of collaborative writing. First is the importance of networking and learning from and with peers. Second is the hands-on experience of engaging in doing research and writing for publication, and third is the deeper understanding of qualitative research, its processes, and its historical development. These three findings demonstrate how collaborative writing and project-specific mentoring provide opportunities for doctoral student development as scholars. Moreover, by showing the learning that occurs through collaborative writing, we also demonstrate how the final text was enhanced and co-constructed in ways that would not have been possible if written by a single author.

Learning Qualitative Research Design through Doing Research

Audra Skukauskaite, PhD

Karen Walker, Clifford Gomba, Maria Cantu, Lawrence White, Richard Ruiz, Andrea Guajardo, Ana Maria De La Portilla, Denise K. Ramon, Erika O. Bowen, Edwin Blanton, Mary Pattie Davis, and Alma Fernandez, Doctoral Students

The purpose of the study is to examine what doctoral students learn about qualitative research while conducting research studies within a Qualitative Research Design class.

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). In the 2001 special issue of *Educational Researcher* scholars have called for studies that examine the preparation of researchers in doctoral programs (Pallas, 2001, Young, 2001). Over the last decade, more research has been published about doctoral education (e.g., *International Journal of Doctoral Studies*), yet the majority of this research focuses on programs, support systems, supervision, and student experiences (Jones, 2013). 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.

This poster presentation is based on analyses of reflections students in the UIW Qualitative Research Design class wrote at the end of the semester, after they presented research studies they had conducted. In the class students worked in pairs to conduct qualitative interviews studies with other doctoral students or faculty. The studies were conducted under the larger program of study on doctoral student experiences and learning of research. This IRB-approved program of study was designed to encompass course projects that related to the overarching focus on doctoral education.

After all six projects were presented in class, the professor sent ten questions for students to reflect about their experience and learning of research by engaging in a focused team project with an umbrella topic. Reflections were analyzed using thematic analysis (Grbich, 2007) to identify key ideas of what students learned about research methodology, participants, themselves, and working in teams. Students also offered reflections about the challenges they faced in learning and conducting qualitative research within a class project.

In commenting on what they learned about qualitative research methodology, students emphasized three areas: qualitative research as a way of thinking; complexity of research; and the learning of techniques and practices needed to conduct a qualitative study well. In reflecting on what they learned about participants and participation in qualitative research, students emphasized the importance of meaning making and gatekeeping roles of participants. About themselves and their teams, students learned ways of listening and collaborating for a common goal. The challenges revolved around issues of time, technological tools, formulating good interview questions, and the complexity of learning research by doing it within one semester. Despite the challenges faced, all reflections demonstrated the value of engaging in actual research studies to learn the qualitative research design.

Readability of Over-the-Counter (OTC) Drug Labels

Daniel De Leon, Pharmacy Student, Brittany Wolda, Pharmacy Student,
Tina Lopez, PharmD, MSc, and Hien Ha, PharmD, BCPS

This study was conducted to evaluate the reading level of common over-the-counter (OTC) drug labels.

OTC medications are thought to be safe, but can potentially be dangerous if contraindicated or used incorrectly. Health literacy experts suggest consumer materials have a reading level of sixth to eighth grade. Some research suggests that many OTC drug information labels have a reading level above 8th grade. Revision of drug information labels may be necessary to ensure proper use by consumers.

Investigation of the reading level of 108 OTC drug information labels was conducted using the Simple Measure of Gobbledygook (SMOG) readability formula. Assessment of the OTC information labels was based on brand, generic, adult products, children products, liquids, pills, topical drug, and primary use of the products. Analyses were performed with chi-square or Fisher's exact as appropriate.

The most frequent reading level of the compiled OTC medications was tenth grade (45%), ranged from eighth grade to twelfth grade readability, and 93% were between ninth and eleventh grade readability. The one product with twelfth grade readability was Sudafed PE Pressure Plus Pain (acetaminophen and phenylephrine). The seven products with an eighth grade readability included Nasacort Allergy, Eye Itch Relief, Opcon-A, Nasal Spray (oxymetazoline), Prevacid, and carbamide peroxide (brand and generic). There was no significant difference in readability between brand and generic store-brand medication drug labels. In addition, there was no significant difference among the medication classes or adult/children products, drug information labels. There was a significant difference ($p=0.42$) among the liquids, pills, and topical products; however, this was likely due to the small number of topical products.

Identification of CNS Sites Involved in the Cardiovascular and Renal Responses Elicited by Nociceptin/Orphanin FQ in Conscious Hypertensive Rats via c-Fos Immunocytochemistry

Bernadette Hollister, Pharmacy Student, Tin Nguyen, Honors Student, Biochemistry,
Cynthia Franklin, MS, Yolanda Rangel, PhD, UTHSCSA, and Helmut B. Gottlieb, PhD

This study examined the changes in cFos expression in forebrain regions of angiotensin II high salt diet (ANGII) hypertensive rats following ICV administration of nociceptin/Orphanin FQ (N/OFQ) or saline vehicle.

Intracerebroventricular (ICV) administration of nociceptin, the N/OFQ peptide agonist, produces a free water diuresis (increase in the excretion of water without concurrent increase in sodium excretion), which is different than most diuretic drugs currently used. In addition, nociceptin also evokes a marked depressor effects on cardiovascular function and renal sympathetic nerve activity (RSNA). As such, this could have an impact on the therapy of diseases that increase water retention and high blood pressure. CFos is a maker for neuronal activation and it can be used as a tool to identify brain regions involved in the nociceptin-mediated diuretic and hypotensive effects. Cfos expression is up-regulated in ANGII rats, however, the effects N/OFQ receptor activation on cFos expression are yet to be determined.

14 days prior to the experiment day, rats were implanted with an osmotic pump filled with angiotensin II and placed on a 2% high salt diet. At the day of the experiments, animals were placed in a metabolic cage and allowed to habituate for 3 hours. Following habituation, then two 15 minutes control periods, rats were than microinjected with either saline vehicle or nociceptin. Ninety minutes after the ICV injection, animals were perfused. Alternate sets of forebrain sections were processed for cFos using a commercially available antibody (Oncogene AB-5). Expression of cFos positive neurons was quantified and data from the cell counts and urine measurements were analyzed by one-way analysis of variance with Student Newman-Keuls t-test for posthoc analysis of significance, which was set at $P < 0.05$. All values are presented as mean + SEM.

ANGII treatment significantly increased cFos staining in the magnocellular and parvocellular regions of the paraventricular hypothalamus and several other brain sites know to be involved in water and electrolyte balance. ICV N/OFQ produced significant decrease in c-Fos staining in these sites as compared to ANGII group microinjected with saline vehicle. Together, central N/OFQ receptor activation in these forebrain regions may participate in the neuropathways involved in the cardiovascular and renal effects of N/OFQ. The knowledge generated will be essential for the development of novel therapeutic strategies for the treatment of hypertension.

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Median Potassium Increases and the Effect of Patient-Specific Factors with Potassium Supplementation in Hospitalized Adults

Tina C. Lee, PharmD, MSCR, Rebecca L. Attridge, PharmD, MSc, BCPS, Jason M. Cota, PharmD, MSc, Cheryl K. Horlen, PharmD, BCPS, and Russell T. Attridge

Our primary objective was to identify changes in serum potassium after supplementation in hypokalemic, hospitalized patients.

Hypokalemia is the most common electrolyte disturbance, with more than 20% of hospitalized patients experiencing hypokalemia. It is traditionally defined as a serum potassium less than 3.5 mEq/L. Many clinicians practice that 10mEq of potassium will raise serum potassium levels approximately 0.1mEq/L in hypokalemic patients; however, this is mostly anecdotal and supported by limited research.

We performed a single-center, retrospective analysis between January 1, 2012 and March 1, 2014 at the Audie L. Murphy Memorial Veterans Administration Hospital in San Antonio, TX. We included patients who received ≥ 10 mEq of enteral or parenteral potassium chloride (KCl) for documented hypokalemia (≤ 3.5 mEq/L) and had repeat serum potassium levels within 24 hours. Exclusion criteria included dialysis, hemolyzed blood samples, surgical patients, and concomitant diabetic ketoacidosis. Descriptive statistics and the Wilcoxon Rank Sum test were used to analyze the primary outcome and differences among patients with comorbidities and concomitant potassium-altering medications.

Most of our 146 hypokalemic patients were male (91.1%) with a median age of 63 years (interquartile range [IQR] 49.75-73). Median initial potassium was 3.2mEq/L (IQR 2.9-3.4) and median KCl supplementation was 40mEq (IQR 40-50) per instance of hypokalemia. Median change in serum potassium per 10mEq KCl was 0.1mEq/L (IQR 0.05-0.15). Enteral vs. parenteral KCl supplementation had similar median potassium changes (0.08, 0.05-0.15 vs. 0.09, 0.03-0.17; $p=0.95$). There were no statistical differences in median potassium changes in patients with comorbid conditions (heart failure, cirrhosis, vomiting, diarrhea) or with potassium-sparing, potassium-wasting, or potassium-eliminating medications. Stratified by initial potassium of ≥ 3 or < 3 mEq/L, median changes in serum potassium per 10mEq KCl were significantly different (0.08 [0.05-0.15] vs 0.13 [0.10-0.18]; $p=0.0003$).

The median change in serum potassium per 10mEq KCl supplemented was consistent with anecdotal practice. Median changes per 10mEq KCl were similar for patients with comorbid conditions and for patients on potassium-altering medications; however, initial serum potassium level may have an effect on median potassium change.

A Central Composite Design of Experiments for BSA Stability at 40°C: The Predictive Quality of Preformulation Studies on Determining the Most Significant Excipients

Joel D. Manrique, Pharmacy Student, Ryan M. Brock, Pharmacy Student, and Adeola O. Coker, PhD

This project was designed to explore the predictive qualities of a design of experiments aimed at revealing both single factor and factor-factor effects of excipients important to the stability of model protein Bovine Serum Albumin (BSA).

Instability of protein therapeutics can occur due to a variety of chemical and physical stressors. The complex three-dimensional structure of proteins along with the reactivity of chemical moieties makes the preparation of liquid formulations a daunting process. Pre-formulation studies require an evaluation of a multitude of excipients and other factors with the potential for contributing to protein stability in a formulation. Evaluation of single factors one at a time is not only impractical but also inefficient at predicting the overall stability of the combined formulation. The significance of a multivariate design aimed at revealing excipient interactions affecting protein stability is to improve the time, cost, and energy required to develop quality protein formulations. The methodology established by this work has an application beyond liquid formulations and has a potential to be extended to a variety of protein dosage forms. This study focuses on the correlations between the effect of liquid conditions on BSA conformation, monitored using intrinsic fluorescence of the protein, and stability at 40 °C.

This study utilizes statistical software to create a central composite design (CCD) aimed at simultaneously exploring the effect of pH, and four commonly used excipients (sodium chloride (NaCl), methionine, sucrose, and polysorbate-80) in protein drug formulations. Both pre-formulation and accelerated stability experimentation of BSA were carried out separately using the same CCD model. Pre-formulation studies were done via intrinsic fluorescence monitoring of BSA's tryptophan residues. This was done using an excitation wavelength of 295nm and monitoring emission maximum (at room temperature) and intrinsic emission intensity ratio of 330nm/350nm (as a function of temperature). Accelerated stability of BSA (under storage for one month at 40°C) was assessed using size exclusion chromatography (SEC). A total of five factors were tabulated and input into statistical software, resulting in 46 samples (including four center points). Pre-formulation responses included emission maximum, intrinsic initial emission intensity ratio (330nm/350nm), and thermal transition midpoint. Accelerated stability responses included percent main peak and total area. All responses were compiled and analyzed using JMP statistical discovery software.

Analyses of excipient effects on BSA unfolding and accelerated stability were observed to be dependent on pH and excipient levels. The effect of the surfactant polysorbate-80 was the only statistically significant excipient observed consistently throughout all five responses. The pH*NaCl factor-factor interaction was also observed consistently throughout all responses. The intrinsic fluorescence data with respect to the pH*NaCl factor-factor interaction proved to be predictive of accelerated stability data. Low pH, high salt concentration conditions appear to worsen BSA unfolding monitored by intrinsic fluorescence and stability monitored by SEC. The results underscore the importance of a multivariate experimental approach to protein formulation design. This approach allows for the identification and characterization of excipient interactions early in formulation development, aiding the design of robust formulations.

Use of an Objective Structured Clinical Examination to Evaluate Clinical and Communication Skills

Elizabeth M. Urteaga, PharmD, Rebecca L. Attridge, PharmD, MSc, BCPS, and Amy P. Witte, PharmD

We used an objective structured clinical examination (OSCE) to evaluate how effectively second-, third-, and fourth-year pharmacy students' communicate and apply knowledge to simulations of commonly encountered patient scenarios. The progression of performance of second- to third-year and third- to fourth-year pharmacy students was evaluated. Students' perceptions were collected to explore the strengths and weaknesses of the assessment.

The use of OSCEs as assessment tools in pharmacy programs is very new so the data are not as robust. In 2010, 32 out of 108 US Colleges of Schools of Pharmacy reported using OSCEs.⁵ Our study will add to the literature available and will potentially allow the Feik School of Pharmacy to use OSCEs as a tool to train students to become highly skilled, culturally-competent, caring pharmacists in our community and beyond. 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 enrolled at the Feik School of Pharmacy completed an OSCE as part of their required courses in 2012 and 2013. The 2013 OSCE was followed by a short survey given to all students. Data were analyzed using the statistical program JMP 10.0®. Descriptive statistics were used to report student perceptions assessed through responses on a Likert scale. All other comparisons were considered statistically significant if the p-value was less than an a priori alpha level of 0.05.

In 2013, 274 pharmacy students completed the OSCE. The median communication and clinical scores out of a score of 100 ranged from 94.5-97.2 and 53.6-54.4, respectively. 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 ($p < 0.0001$). Two hundred and eighty-one students completed the anonymous survey. Over 97% agreed that the OSCE was a well-structured and practical experience; however, only 86% felt competent to provide the type of care seen in the OSCE. The results of this study demonstrate competence in communication skills and provide encouragement that clinical skills improve as the students' progress through the curriculum.

Work Ethic as a Predictor of Ego Depletion: Positive and Negative Associations

Joshua D. Bazy, Ph.D.

This study examined the ways in which varying dimensions of work ethic explained the degree to which participants were depleted of their self-control resource (i.e., ego depletion). It was hypothesized that *hard work* and *delay of gratification* would be positively related to ego depletion whereas *leisure* and *self-reliance* would be negatively related.

Research has identified self-control as not only a trait, but also a resource that can be depleted (Baumeister, 2002). Engaging in actions requiring self-control leads to depletion of this resource. This, in turn, inhibits one's ability to engage in future actions that also require self-control (e.g., resisting temptation, persistence following failure and task performance; Hagger et al., 2010). Previous research has sought to identify the degree to which ego depletion's impact varies as a function of traits and behavior. One finding is that those who regularly restrain their behavior are more susceptible to ego depletion (Baumeister et al., 2006). By extension, it was hypothesized that ego depletion ratings would vary as a function of work ethic dimensions that conceptually relate to behavioral restraint (i.e., hard work, delay of gratification, leisure and self-reliance).

Participants were 108 undergraduate students who completed the Multidimensional Work Ethic Profile (Miller et al., 2002). In a separate session, participants engaged in an ego depleting task (Wegner et al., 1987), followed by a depletion questionnaire (Muraven et al., 2006), measuring thought control and effort exertion. Analyses were performed using multiple regression.

The regression model explained a significant proportion of the variance in ego depletion ratings ($R^2 = .131, p < .01$). As predicted, hard work was positively related to depletion ratings ($\beta = .362, p < .001$), whereas self-reliance was negatively related ($\beta = -.190, p = .05$). However, delay of gratification ($\beta = -.058, p = .582$) and leisure ($\beta = .014, p = .882$) were not significantly related to depletion ratings, failing to confirm hypotheses.

Results show that individuals with stronger beliefs in the value of hard work are more likely to experience ego depletion. Conversely, more self-reliant individuals are less likely to experience depletion. These results have implications for organizational selection and job performance. Those who place greater value on hard work are in fact more likely to become depleted. This may provide insight into previous results finding a negative relationship between hard work and academic performance (Meriac, 2012). Perhaps individuals with a greater belief in the value of hard work exert themselves to the point of exhaustion, resulting in ego depletion and decreased performance. On the other hand, those less dependent on others appear less impacted by self-control exertion. Self-reliant individuals seem to be better able to resist potential self-control depletion and therefore should be better able to perform even under adverse conditions. Again, this fits with results finding a positive relationship between self-reliance and job performance (Miller et al., 2002). Organizations might be well served to seek employees with a need for self-reliance and autonomy more so than simply hard work.

¿Quiénes Somos?: A Portrait and Analysis of Attendees of an All-Day Saturday Workshop Series Within a Graduate Student Community at a Majority Hispanic Serving Institution

Carlos de Leon, MBA Student and David A. Ortiz, PhD

The aim of this study was to identify the profile of graduate students who attend an all-day Saturday Workshop. The researchers hypothesized that attendees would emulate the demographic make-up of all graduate students at the university.

In their 2009 publication, *Graduate Education and the Public Good*, the Council of Graduate Schools (CGS) stated that graduate schools must develop a more inclusive model of access and success. The format of an all-day Saturday workshop is designed to provide an inclusive and non-traditional approach to student academic services. The CGS goes on to further state that underrepresentation of Hispanics in post baccalaureate education is also a national crisis. According to Fry (2011) the rate of master's degree attainment among Hispanics lagged behind that of their peers among other races/ethnicities. In 2010 only 2% of Hispanics had completed a master's degree versus 8% of Whites, 18% of Asians/Pacific Islanders, and 5% of Blacks (Fry, 2011). As a majority Hispanic Serving Institution, UIW's ability to positively impact Hispanic student success in graduate school through innovative Saturday programming can significantly yield proven best practices strategies for academic success.

Descriptive and summary statistics were used to provide an overview of the sampled participants (n=87) throughout three Saturdays workshops offered in Fall 2013 and the general population of master's students enrolled at UIW during the Fall 2013 semester (N=846). The researchers analyzed Fall 2013 semester enrollment data from the Institutional Research Office's DASH system, which provided a breakdown based on a disaggregation by age, gender, and ethnicity for all students. This data was then compared to the age, gender, and ethnicity for all attendees of the three Saturday Series workshops under study.

Female students attended at a rate of 74.7% compared to a total female population of 60.4%. Hispanic students attend at a rate of 69% compared to a total population of 50%. The average age for Master's students was 31.1. Students under the age of 30 attended at a rate of 57.5% compared to a total population of 52.8%. Students over the age of 31 attended at a rate of 42.5% compared to a total population of 47.2%. However, students 50 and above attended at a proportional rate of 23.8% compared to 11.2% in the 18-29 bracket. In summary, this study suggests that female and Hispanic students are over represented at Saturday workshops. Further, due to the larger size of students younger than 30, their participation is numerically higher, however proportionally students older than 50 are attending at a higher rate.

Psychometric Properties of Two Instruments that Measure Health Professional Student Perceptions of Interprofessional Education

Daniel G. Dominguez, PhD, David S. Fike, PhD, Eric J. MacLaughlin, PharmD, Texas Tech University Health Sciences Center, and Joseph A. Zorek, PharmD, University of Wisconsin – Madison

To compare the validity and reliability of two instruments used to assess health professional students' perceptions of interprofessional education (IPE).

Health professional education programs incorporate IPE activities into curricula in response to evolving health policy and accreditation requirements, thereby creating a compelling need for valid and reliable instruments to assess student perceptions regarding IPE experiences. This study entails the evaluation of the psychometric properties of two instruments administered concurrently to the same sample of students.

Published studies document the validity and reliability of the Student Perceptions of Physician-Pharmacist Interprofessional Clinical Education (SPICE) and Attitudes Toward Health Care Teams (ATHCT) instruments. The 10-item SPICE and 21-item ATHCT instruments were revised (named SPICE-R, ATHCT-R, respectively) so that the instruments could be used to assess student perceptions of IPE within a broad range of health professional education programs. SPICE-R and ATHCT-R were administered concurrently to first-year UIW students (N = 221) in pharmacy, nursing, optometry, physical therapy, and health administration programs. Confirmatory factor analysis (CFA) was conducted to compare the psychometric properties of SPICE-R and ATHCT-R.

Based upon CFA models, SPICE-R demonstrated acceptable goodness-of-fit on several indices while ATHCT-R lacked goodness-of-fit. SPICE-R generally demonstrated higher item and factor reliabilities than ATHCT-R. SPICE-R outperformed ATHCT-R with respect to average variance extracted. Construct validity (including convergent and discriminant validity) were established for SPICE-R. This comparison of two instruments administered to the same student populations at the same time revealed that the parsimonious SPICE-R instrument displayed stronger psychometric properties than ATHCT-R. SPICE-R demonstrates promise as a valid and reliable tool for measuring health professional students' perceptions regarding the impact of IPE experiences.

Ethics in the Real Estate Profession: Agent Commission Disputes

Anida A. Duarte, DBA Student, J.T. Norris, CPA, CGMA, PhD, and Annette E. Craven, PhD

There is a dilemma within the real estate industry and who owns the rights to commissions. Consumers may work with multiple agents for various reasons and this leads to complicated legal disputes. The purpose of the study was to evaluate if there was a relationship between a real estate agent's years of experience and Procuring Cause Law (right of commissions). The presumption was that a real estate agent's years of experience protected their commissions versus the law. It may be concerning to real estate professionals that most individuals rely on their experience versus the law to protect their incomes.

The importance of this study will assist real estate agents and brokers in their right to commissions. As consumers become more empowered, they may inadvertently cross legal barriers they are unaware of. It is important to understand if agents are well prepared concerning Procuring Cause Law or if other variables influence these positive outcomes. Real estate agents would cease to exist without the tools to protect their rights to commissions. This type of research may bring more awareness to the importance of the law to consumers, agents, and brokers. Bringing more awareness will also protect the consumers in the long run.

A survey was sent to 100 respondents at various real estate broker offices in Texas from 12/1/13-1/31/14. The cities targeted for this survey were as follows: Dallas, Fort Worth, Houston and San Antonio. The response rate was 20% and a chi squared test of independence was conducted to analyze results. The survey was comprised of 12 questions which included demographic questions, industry specific questions, and fill in the blank responses. IRB approval was obtained prior to sending the survey.

We failed to reject the hypothesis and concluded that real estate agent experience and not Procuring Cause Law produced favorable outcomes in commission disputes. It is recommended that real estate agents and brokers focus their attention on ensuring the consumer understands Procuring Cause Law, and the corporate social responsibility of not intentionally cheating an agent out of commissions. Since the law is extremely vague, it is to the agent's benefit to assist consumers with this tool.

However, the statistical analysis of chi square test of independence did not meet the threshold of 95% confidence. This is due, in part, by a relatively small sample size and response rate. It is recommended that the survey be expanded, retested, and include a broader audience of agents and brokers across the United States.

Getting Things Done: A Comparison of Time to Degree Rates among Master’s Cohort vs. Non-Cohort Groups

Jessica Garcia, MHA Student, Inci Yilmazli, MAA Student, and David A. Ortiz, PhD

The purpose of this study was to examine the time to degree for master’s students in four separate graduate programs. Specifically, the researchers hypothesized that a structured cohort academic program would yield higher completion rates within two years compared to three non-structured cohort academic programs.

Lawrence (2002), Bochenek (1999), Saltiel and Russo (2001), and Brooks (1998) have all discussed the benefit of the cohort learning experience in adult degree programs. Cohort programs are becoming more popular in graduate schools as they allow students to work collaboratively and develop team-work skills. Cohort programs can have significant influence on the rates of persistence, graduation, and success in graduate schools (Lei et al., 2011; Maher, 2005). Moreover, Drago-Severson (2001) found that cohorts and collaborative groups made a critical difference to their academic learning, emotional, and psychological well-being, and ability to broaden students’ perspectives. Kegan's theory of adult development (1982, 1994) considers a person as a maker of meaning throughout his or her lifespan. We employ this framework to suggest why and how the use of cohorts in graduate education is important in building a framework of student success in Master’s degree programs. That is, programs which establish a cohort model increase the likelihood not only of graduation but also “timely” graduation. Graduate degrees that are completed within the purported two-year curriculum may increase the chances of recruitment and student satisfaction.

This study examined the time to degree rates for Master’s students in four separate academic programs at the University of the Incarnate Word’s HEB School of Business. We collected our data via reports obtained from the UIW Institutional Research Office. We included the MHA cohorts and the non-cohort academic programs of MAA Organizational Development, MBA Business Administration and MBA International Business that started in Fall 2011 and Fall 2012. We eliminated adult degree completion program (ADCaP) students as well as the students who started their education during Spring semesters to be able to compare programs under the same circumstances. Our sample size consisted of a total of 117 students for 6 non-cohort programs (average size of 19.5 students) and a total of 25 students for 2 cohort programs (average size of 12.5 students). Two-year time to degree rates were measured by a starting term and a graduating term which consisted of 4 continuously enrolled semesters excluding summers.

Graduation rates for the two MHA cohorts were 100% (FA 11) and 92% (FA 12). Comparatively, graduation rates among non-cohorts were: MBA Business Administration 50% (FA 11) and 26% (FA 12); MBA International Business 46% (FA 11) and 33% (FA 12); and MAA Organizational Development 61% (FA 11) and 12% (FA 12). In sum, the two-year time to degree rates for cohort models outpaces non-cohort models significantly. The findings present a model for student success via graduate cohorts. Further qualitative data is required to reveal the value of cohort education for individuals in order to explain the profiles of students who take longer to complete their programs and why.

Account Aggregation Tools: History and Use for the Future

James R. Green, CFP, DBA Student and Annette E. Craven, PhD

The purpose of this project is to review the history of account aggregation programs and the barriers to adoption by the consumer. The study then suggests adoption of account aggregation programs can be effective as part of financial planning software. Account aggregation, has experienced an ebb and flow to its adoption in the United States. Only in the last five years (2008-2013) has adoption of this technology significantly increased. Account aggregation is a way to help consumers, and if necessary their financial advisors, manage consumer finances. Though the concept of account aggregation has experienced slow adoption, the future appears to be open to new uses of the technology. The most promising is the concept of virtual financial planning. As data aggregation gets increasingly more reliable and accurate, account aggregation can form the foundation of more complex financial tools.

By understanding account aggregation programs we can better understand how these programs can facilitate the development of a broader, holistic, do-it-yourself financial planning program. Imagine being able to see on one document or one web page all of your financial account balances: balances from two banks where you have checking accounts; savings accounts and a certificate of deposit or two; the loan balances from a third bank where you have your car loan because of the good deal you got at the dealership; credit card balances from any of the major credit card companies; the latest balance of your investment accounts at your brokerage firm; your 401(k) balance at another brokerage firm; values of cash-value life insurance accounts; the market value of your house along with your outstanding mortgage balance; and even the airline miles from your airline rewards program. All of these financial accounts in one place, updated in near real time, and organized into Assets, Liabilities, and Net-Worth, giving you a clear and simple picture of your financial health. This service--account aggregation service--is available today even on your smartphone.

A thorough review of the literature describing the development of account aggregation software programs and how they can be integrated with financial planning software sets the framework for a more exhaustive study on efficacy of holistic do-it-yourself financial planning software.

Financial services companies now have more motivation to embrace account aggregation technology. Offering additional online financial tools can create customer loyalty. In this fast-paced electronic environment, the barriers to customer switching are low. Offering and then capitalizing on financial analysis tools tends to aid retention of current customers (Caswell, 2001). Driven by the ever increasing, fast-paced, technological advances in a mobile connected society, consumers are looking for financial tools providing immediate answers. Consumers have increasing time constraints, and their financial needs are becoming more complex. As a result, there is an increasing demand for efficient ways to manage their finances. The real power of account aggregation lies in its ability to establish the full financial picture and provide the foundation for more advanced financial analysis.

Service Quality Dimensions and Service Personal Values Conveyed in Medical Tourists' Online Testimonials: The Voices of Cosmetic Surgery and Stem Cell Therapy Patients

Michael Guiry, PhD and Sofia Vasquez Arroyo, MBA Student

The purpose of this study is to 1) determine the service quality (SERVQUAL) dimensions and service personal values (SERVPVAL) conveyed in medical tourists online testimonials, and 2) relate the communication of the SERVQUAL dimensions to the type of medical care received and SERVPVAL expressed in the testimonials.

Globally, medical tourism (MT) has become one of the fastest growing tourism sectors with over 50 countries having identified MT as a national industry (Rad et al., 2010). With this development, research on MT has increased significantly in recent years (An, 2013). Nonetheless, there is a need for more research to better understand the demand side of this growing industry (Gan & Frederick, 2013). Since both outcome and process SERVQUAL remain a concern for medical tourists (Lunt et al., 2011), MT providers need to better understand medical tourists' perceptions of their international patient experience (Guiry & Vequist, 2011). Previous research suggests examining SERVQUAL perceptions within the context of SERVPVAL (Guiry et al., 2011), and taking into account the type of medical treatment medical tourists travel for (Guiry & Vega, 2014). Therefore, this study extends previous MT research on SERVQUAL and SERVPVAL by investigating the research purpose stated above. The author has not identified any studies in the MT literature that have addressed these research issues.

Content analysis of 138 medical tourist testimonials, posted on a U.S.-based MT facilitator's website, was used to determine the SERVQUAL dimensions and SERPVAL communicated in the testimonials. Cross tabs with chi-square tests were used to investigate the relationship between the SERVQUAL dimensions cited and 1) types of medical treatment received, i.e., cosmetic surgery (CS) or stem cell therapy (SCT), and 2) SERPVAL mentioned.

Sixty percent of the testimonials are from CS patients; 40% are from SCT patients. Of the five SERVQUAL dimensions, reliability qualities were most frequently mentioned in the testimonials (95%), followed by assurance (54%), empathy (36%), tangibles (17%), and responsiveness (17%). CS patients were more likely to refer to tangibles ($\chi^2 = 6.16$, $p = .013$) and responsiveness ($\chi^2 = 7.89$, $p = .005$) aspects of their MT experience than SCT patients were. In contrast, SCT patients were more likely to mention reliability issues than CS patients were ($\chi^2 = 4.74$, $p = .029$). No significant differences were found between the two types of medical tourists regarding citing assurance and empathy qualities. Of the three SERPVAL dimensions, service value to peaceful life was mentioned most often in the testimonials (62%), followed by service value to social recognition (9%), and service value to social integration (7%). Testimonials referring to service value to peaceful life were more likely to comment on assurance ($\chi^2 = 13.10$, $p = .000$) and reliability ($\chi^2 = 7.25$, $p = .007$) qualities of their MT experience than not touch upon these dimensions. The results suggest that MT facilitators should concentrate on communicating the reliability and assurance dimensions of overseas MT providers when targeting prospective medical tourists as well as positioning MT as being a service that fosters a peaceful life. Furthermore, MT facilitators that provide information about traveling abroad for CS and SCT should focus on communicating the tangibles and responsiveness dimensions of CS providers and the reliability facets of SCT providers.

Transfer Pricing: Intangibles, Uncertainty, and Tax Minimization

April Poe, PhD, MPA, CPA

Due to increased globalization, transfer pricing issues have become more common, more complex, and more important to countries in protecting their tax revenue. This study is motivated by regulatory concerns that U.S. based multinational enterprises use transfer pricing to generate income tax savings beyond levels expected by taxing authorities. Transfer pricing is the intercompany price a multinational (MNE) charges itself as it moves good and/or services across borders among its subsidiaries.

This paper contributes to the accounting literature by furthering the understanding of the choices made by firms to influence their worldwide effective tax rate (WWETR), choices that are important to policymakers and taxing authorities. By lowering their WWETR, MNE's are avoiding paying income taxes, typically avoiding them primarily in high-tax countries such as the U.S. Intense focus is being concentrated on transfer pricing as a significant income tax issue by numerous governments and global organizations, and transfer pricing involving intangibles is a particular area receiving attention. The U.S. may be losing up to \$60 billion in tax revenue due to transfer pricing schemes.

The sample consists of all firm-year observations with the needed variables available in COMPUSTAT for 2000-2010, resulting in 11,523 total observations. The dependent variable, worldwide effective tax rate (WWETRVAR), is intended to capture the impact of both temporary and permanent book-tax differences. The variables of interest are research and development (RDIATVAR) and intangibles (INTANGVAR) and their interaction with a measure of foreign intensity represented by foreign assets reported. RDIATVAR is the measure of a firm's level of research and development activity defined as the ratio of research and development expenditures (R&D) to total assets. INTANGVAR is computed as total book value of intangible assets excluding goodwill divided by total assets. I use a truncated regression analysis to adjust for the truncation of the data at the top and the bottom.

These results indicate that intangibles, whether booked on the balance sheet or expensed as R&D, are relevant in explaining the WWETR for an MNE. At measures of foreign intensity of 10% and 20%, a significant level of foreign operations, the results are consistent. The results are consistent with utilizing intangibles to influence the worldwide effective tax rate in the presence of cross-jurisdictional transactions.

Decreasing Catheter-Associated Urinary Tract Infection Rates in a Hospital in South Texas

Marilou R. Albances, BSN, RN, MSN Student, Shiela M. Herrera, BSN, RN, MSN Student, and Jennifer Cook, PhD, RN, MBA

The purpose of this study is to assess the microsystems, and review the nursing documentation in the medical records regarding the use of the Catheter Associated Urinary Tract Infection (CAUTI) prevention/response bundle with patients who had indwelling urinary catheters while in the Surgical Intensive Care Unit (SICU) and / or who had an indwelling urinary catheter prior to admission to the Intermediate Intensive Care Unit (IICU) in an acute care hospital in South Texas.

The CAUTI rate for this acute care hospital was on a decreasing trend during the early part of this year but an increase has been noted the last few months. The significance of the study is that the facility has requested assistance with the identification of causes related to the increased incidence of CAUTI. Compliance with CAUTI protocol is directly related to prevention of catheter-associated urinary tract infection (CAUTI) which is one of the most common hospital acquired infections (HAI) (Meddings, et. al, 2012).

This is a descriptive study and quality improvement project. A full microsystem assessment was conducted using the Dartmouth model and the Five P assessment methods. CAUTI data was provided by the Infection Preventionist for the two units. Data regarding documentation of the use of the CAUTI prevention protocol was collected using retrospective chart review for patients diagnosed with CAUTI from indwelling catheters. Data gathered is being analyzed using SPSS and compared to the best evidence practice to prevent CAUTI.

The preliminary findings obtained from the EMRs show incomplete documentation of urinary catheter insertions, date of insertion and catheter management. Documentations regarding urinary catheters is in compliance with the protocol for length of time for dwell of the catheter.

Improving Central Line Infection Rates in Acute Care Environments in South Texas

Catherine O. Carandang, RN and Jennifer Cook, PhD, RN, MBA

The purpose of this study is to conduct a detailed microsystem assessment of an ICU and an Oncology unit in an acute care hospital in a metropolitan city in south Texas, to identify gaps in practice related to maintenance of central lines, that has led to an increase in the number of central line associated blood stream infections (CLABSI).

The hospital in south Texas has not been successful in keeping the CLABSI rate to zero percent. There has been an increase in the rate of CLABSI from less than 1% to greater than 2% per 1000 patient days despite having central line protocol in place. This increase in CLABSI rate makes this study significant.

This is a descriptive study and quality improvement project. A full microsystem assessment is being completed using the Dartmouth model and Five P assessment methods. It entails retrospective chart review of twenty-five (25) medical charts of patients with central lines who were diagnosed with CLABSI. Evidence of documentation of central line maintenance will be collected from EMR's. The data collected was analyzed for frequency of compliance with as well as deficits found in documentation of the protocol.

The preliminary finding of the study from EMRs is revealing a lack of documentation of compliance with protocol related to hand hygiene, central line maintenance. This includes documentation of timely sterile dressing changes, use of Chlorhexidine antiseptics, and lack of documentation to support continued need for central line. The finding of the observation of practices shows lack of 100% compliance in IV tubing's labeling practices, assessment and monitoring of the site for infection and lack of catheter hub care protocol adherence.

CLABSIs are among the most frequent health care-associated infections and cause significant morbidity and mortality as well as increased costs to the health care system. The reduction in rate of CLABSI is dependent upon compliance with the protocol, which stems from evidence in research.

Documentation of Sepsis Protocol in Medical Records of Patients Diagnosed with Sepsis

Gina Esquivel, MSN, RN, MSN Student and M. Danielle Gunter, PhD, CPN, RN

The purpose of this study is to gather information to identify causative factors related to an increase in sepsis by describing the use of the sepsis screening tools, treatment bundles and staff communication patterns within a general and medical-surgical microsystem at a southwestern hospital.

Sepsis is a systemic inflammatory response that arises from an infective process, which may be caused by bacterial, viral or fungal invasion (Steen, 2009). Alternatively an inflammatory response may arise from a non-infective process (severe burns, tissue damage/ischemia, surgery, complications related to adrenal insufficiency, or heart attack) known as systemic inflammatory response syndrome (SIRS) (Steen, 2009). SIRS and sepsis can lead to severe sepsis and septic shock (Tazbir, 2012). More than a million Americans become septic every year (2014, NIH). Estimates are that between 28%-50% of these die (2014, NIH). The Surviving Sepsis Campaign showed that early identification and aggressive treatment protocols have improved survival of sepsis patients. Even so, sepsis continues to be a leading cause of death and those survivors are more likely to have physical or cognitive deficits, and permanent organ damage (NCHS data brief, 2011). Sepsis was listed as the most expensive condition treated in hospitals by the AHRQ. In 2011, the cost was more than 20 billion (2014, NIH). As such, sepsis screening and prompt treatment to improve mortality is a priority for this Southwest facility.

This descriptive, observational study took place in a medical surgical unit & intermediate medical surgical unit in a hospital in the Southwest. Medical records of patients who were diagnosed with sepsis were reviewed for documentation of the implementation of the sepsis bundle. Facility data for sepsis rates, unit specific rates and use of the sepsis bundle guided the chart review. Representative samples of charts were reviewed and data abstracted into the data collection tool for analysis. The SPSS program was used for data analysis.

Preliminary findings from chart reviews are indicating incomplete or non-compliance with the sepsis screening tool, limited use of the sepsis order sets and poor compliance with the time metrics associated with the initiation of the sepsis order sets.

The Effectiveness of Cinema Education as a Tool to Teach about End of Life Issues

Irene Gilliland, PhD, RN, CNS, ACHPN and Bradi Frei, PharmD, MSc, BCOP, BCPS

The purpose of this study is to determine if viewing a faculty selected film about end of life issues, reflecting on the film, and debriefing after the film broadens student awareness and attitudes about end of life care.

Health care professional degree programs have devoted very little time in curricula to the care of the dying patient and the grieving family. With an aging population and shortage of health care resources, health care professionals need to be comfortable dealing with issues of death and dying in all practice settings. Movies, especially documentaries, can offer a realistic look at what a patient and family experience as the end of life approaches. The pervasiveness of video in the lives of today's students sets the stage for the use of films as a teaching tool.

Before movie "Fault in Our Stars", students were asked to write a one page reflection about how they feel about end of life issues and healthcare provider roles prior to the beginning of the movie. After students viewed the in-class movie, there was a 30 minute debriefing with the entire group discussing the movie and any changes in attitudes about end of life issues. After debriefing, the students were asked to write another reflection regarding their attitude about EOL issues.

Seventeen students participated in watching the movies, the discussions and the individual reflections. A majority of the participants were female (13; 76%); Christian (11; 65% although Muslim, Hindu and agnostic were also represented); and of varied ethnicities (35% White, 24% African American, 18% Hispanic). Ten out of 17 students initially were supportive of assisted suicide. Six students reported changing how they feel about assisted suicide as a result of the learning activity. They found the movie (a documentary) provided them with additional knowledge about the topic, and the discussions with classmates helped them see another side of the issue.

Themes identified in "Fault in our Stars" were changes in viewpoint about a terminal patient from one who was debilitated and bedbound to one leading a reasonably normal life. They were surprised by the portrayal of healthcare providers in the movie with MDs being portrayed as insensitive and the nurses compassionate. When faced with a terminal illness all but one student reported they would tell their family and very close friends and want to strengthen those relationships. Most students felt the movie helped them see life through a patient's eyes since very few have had an experience with death of loved ones.

Movies can be used effectively with sensitive topics such as death and suicide. Although the movies themselves did not change students' views about the topic, the subsequent discussion and reflection provided additional information that expanded their perspectives.

The Effect of Stroke Education on Stroke Readmission Rates

Felicity M. Guajardo, BSN, RN, MSN Student and Monica Vidaurri, BSN, RN, MSN

The purpose of this study was to compare impact of stroke education provided to patients at discharge in the years 2010 and 2014 on stroke readmission rates.

According to the American Stroke Association (2012) a stroke occurs approximately every 40 seconds, and a person dies of stroke about every 4 minutes. Stroke is the leading cause of adult disability and fourth cause of death in the United States (American Stroke Association [ASA], 2012b). Education and prevention is necessary in order for post stroke patients to recognize and identify symptoms of a recurrent stroke. Readmissions to the hospital are often caused by recurrent strokes or by medical complications of stroke (Ostwald et al. 2013). A comprehensive stroke education program was implemented after 2010 in a large faith based hospital in Texas. There was a need to measure the effectiveness of education for planning of future programs.

This quantitative descriptive study utilized a retrospective electronic chart review for data collection. Data was collected on readmission rates within 90 days of discharge, patient demographics, and type of education rendered to each patient at discharge for both 2010 and 2014. The sample consisted of a randomized convenience sample of 40 patients diagnosed with stroke at discharge. Twenty patients from each year (2010 and 2014) were randomly selected and assigned a number for confidentiality. Selected patient demographics included race, gender, age, and comorbidities. Readmission rates within 90 days of discharge after a diagnosis of stroke were compared between groups to determine if appropriate stroke education had significance on stroke readmission rates. Descriptive statistics were used to analyze patient demographic data and Chi square was used to determine effect of education on stroke readmission rates between the 2 groups.

Patient demographics for both groups were similar except for diabetes which accounted for 70% of patients in 2014, 20% for 2010. Both groups were predominantly Caucasian (56-75%), followed by Hispanic (15-25%) and gender distribution was equal in both groups (40% male, 60% female). The average age of the sample in 2010 was 74.5 and 2014 72.3. Although stroke-related readmission rates decreased from 60% in 2010 to 45% in 2014, this change was not statistically significant ($p=.342$). Stroke re-admission rates seemed positively associated with age. The small sample size and an incomplete stroke data base make implications hard to identify. A larger sample over a longer period of time is recommended before any changes are made to the current education program.

Social Support to Reduce Uncertainty in Childhood Cancer in South Texas: A Case Study

M. Danielle Gunter, PhD, CPN, RN

Determine the perceptions and meaning of uncertainty in both parents and members of the health care team within this childhood cancer program and determine types of supportive and educational measures found to be most helpful and feasible for families of pediatric oncology patients during the first three months after diagnosis.

Supportive and educational measures for families facing a new diagnosis of childhood cancer are needed to address uncertainty and adaptive behaviors. Previous evidence suggests support groups and formal class sessions are effective in facilitating adaptation; however, implementation is difficult and has thus far been fairly unsuccessful in the south Texas area. Traditional methods of psychosocial support do not meet the needs of parents and families in this situation or geographic region. Participants prefer more informal meetings and gatherings that are more social in nature where they can learn from each other and share experiences that will help them adapt. By investigating perceptions of uncertainty and discovering recommendations from within the childhood cancer program, interventions can be developed that will directly impact the families being treated here. Reducing their uncertainty and providing culturally appropriate and family-centered care is essential to facilitate their successful adaptation to life with a childhood cancer and return to normalcy within their family dynamic. This adaptation is crucial in facilitating positive patient/family outcomes.

A descriptive single embedded (i.e. multiple informants) case study was used to study uncertainty and social support for families with children treated at an inpatient, pediatric hematology/oncology/bone marrow transplant department in south Texas. The sample included 15 members of the health care team in a pediatric cancer/bone marrow transplant unit and 6 parents of children diagnosed with cancer. Data was gathered through interviews and observation of various family activities on the cancer unit carried out over a six month period. Data was analyzed through thematic content analyses and pattern matching using N-Vivo 9 software.

Five themes were identified demonstrating differences in health care team members' and parents' perceptions of facilitators and barriers to reduction of uncertainty and successful parental adaptation. Findings include recommendations for psychosocial and education support for parents and the immediate family that provide consistency and additional assistance during the diagnostic and transitional phases of the treatment plan. They also suggest changes in the institutional culture supporting a more family-centered approach. These outcomes are helping to guide nursing practice and interdisciplinary collaboration within this program, as well as development of guidelines for caring for Hispanic families going through similar circumstances in a more generalized population.

UIW Team for Kids: Asthma and Obesity

Linda D. Hook, Dr(c)PH, MSN, RN, Monica Ramirez, PhD, RN, Leticia Ybarra, MSN, FNP,
Delia Meyer, MSN and Cynthia Nguyen, PharmD

To implement a short-term community-based asthma and obesity intervention project using teams of health care professional students as health coaches among families with identified asthmatic children who attend an inner-city Head Start program.

Childhood asthma has significant health and economic consequences at multiple levels within our communities. The costs are high with impacts not only on the child but to health care systems, parents, and school systems. For the young child, ages 3-5, current medical knowledge supports family-centered asthma management through environmental trigger recognition and control along with effective communication of asthma action plans. In addition, research has supported a link between obesity and asthma. Future health care professionals must develop practice-ready skills of communication, teamwork, ethics and values to work with complex chronic diseases such as childhood asthma.

A prospective intervention cohort study of sixteen families with asthmatic children, ages 3-5 was used. The families were recruited from Tynan Head Start program, located in the Eastside San Antonio. The intervention included four weekly asthma education sessions and an environmental home assessment. The healthcare professional students – nursing, pharmacy, and respiratory care – were trained in ACCN’s Expert Panel recommendations for Interprofessional Education (IPE) core competencies, www.aacn.nche.edu, US Environmental Protection Agency Home Asthma Checklist, www.epa.gov, and Allergy and Asthma Foundation Wee Breathers curriculum, www.aafa.org. The weekly classes were led by a team of students in a small group discussion format with pre and post evaluation of the material presented. Families were given household supplies to use to reduce known environmental triggers, i.e., dust mops, wet mops, buckets, mattress and pillow protectors, and roach gel. A post-intervention evaluation home assessment was conducted to determine the families’ adoption of the intervention, using the EPA Home Asthma Checklist and elicited verbal responses. The healthcare professional students provided elicited verbal and written responses about the experience in relationship to IPE core competencies.

Twenty families participated in the intervention. The pre-assessment data reflected what has been cited in published literature, i.e., lack of knowledge of environmental triggers including cigarette smoke, dust and dust mites. In addition, there was deficiency in understanding asthma action plans, use of asthma medication delivery system-spacers and masks, and use of parent daily log of asthmatic symptoms. In addition, the pre-assessment responses suggested the parents knew about healthy eating but needed reinforcement about how to daily accomplish for child and family, like recipes and cooking ideas. The two evidence-based curriculums used were suitable and matched the learning needs of the families. This interprofessional intervention project supported the need for innovative community-based interventions to understand the multiple risk factors that contribute to the disparities seen in childhood asthma and obesity. The interplay of individual families, health care system, and environmental factors need further study to design effective systems of care.

This activity was supported in part by a purchase of service award from Promise and Choice Together (PaCT) Health and Wellness Mini Purchase of Service (POS) (www.eastsidepromise.org).

Influences of the Emergency Nurses Professional Association on the Socialization of Emerging Emergency Nurses

Michael D. Moon, PhD, MSN, RN, CNS-CC, CEN, FAEN

The purpose of this exploratory qualitative study was to investigate how the professional association for the specialty of emergency nursing influences the socialization of engaged emergency registered nurses, who have been in emergency nursing 5 years or less, herein referred to as emerging emergency RNs.

Little is known regarding the role that professional associations play in the socialization of new RNs. What is lacking in the literature are studies that examine how newly licensed RNs transition from novices in the profession to more experienced RNs. This study helps to better understand the role that the professional emergency nursing association plays in the socialization of emerging emergency RNs to the specialty.

A qualitative exploratory approach based on an interpretivist framework was used as the design for this study. Purposeful sampling, which included intensity and maximum variation sampling, was employed resulting in 14 participants who were identified and agreed to participate in the study. The methodological approach utilized was face-to-face semi-structured interviews. Descriptive, “in vivo”, simultaneous, and sub-coding techniques were utilized to analyze the data.

Five major themes and 12 subthemes were discovered supporting that the professional association for the specialty of emergency nursing does play a role in the socialization of emerging emergency RNs. The five major themes were *allows connections with other professionals*, *advocates for the profession and patients*, *provides professional development*, *fosters a sense of identity*, and *encourages community involvement*. Each of the themes with the exception of *encourages community involvement* had subthemes that supported the major themes:

The first theme, *allows connections with other professionals*, had four subthemes, which included *supports RN role transition*, *networking*, *sharing of advice and experiences*, and *promoting a broader perspective*.

The second theme, *advocates for the profession and patients*, had three subthemes, which included *sets the standards of practice*, *provides legislative resources*, and *keeps the profession safe and current*.

The third theme, *provides professional development* had three subthemes as well, which included *improves and validates knowledge*, *career development*, and *leadership development*.

The fourth theme, *fosters a sense of identity*, had two subthemes, which included *provides a voice for the specialty* and *promotes a sense of belonging*.

Two of these themes, *fosters a sense of identity* and *encourages community involvement*, and two of the subthemes, *career development* and *leadership development*, provide unique contributions to the body of knowledge on professional associations. This study highlights the complex role that the professional association for the specialty of emergency nurses plays in the socialization of emerging emergency RNs.

Cervical Cancer Prevention Quality Improvement

Patricia A. Obulaney, MSN, RN, ANP-C, Holly Cassells, PhD, RN, and Irene Gilliland, PhD, RN, CNS, ACHPN

The Centers for Disease Control and Prevention (CDC) attribute the majority of cervical cancer incidences to chronic human papilloma virus (HPV) infections (2014). In 2006, the vaccine to protect against HPV was approved by the United States (US) Food and Drug Administration (FDA), and entered the health care arena as a primary prevention against cervical cancer (Kepka, Coronado, Rodriguez, and Thompson, 2011). The 2013 statistics indicate only 37.6 % of females between the ages of 13-17 received the entire three-dose series of the HPV vaccine (CDC, 2014). A Moffitt Cancer Center study (2014) illuminates the importance of HPV vaccine education and provider recommendation in cervical cancer prevention. Despite best practice clinical guidelines, prior to the project, HPV vaccination uptake at the clinic remained dismally low compared to HPV vaccine rates in the surrounding counties (CDC, 2013).

The purpose of this quality improvement (QI) project was to determine if language-appropriate, mother/daughter, HPV/cervical cancer (HPV/CC) prevention education would positively impact mother's intent and actual uptake for HPV vaccination of their nine through 18 year-old daughters in a small rural clinic setting.

Initially, the DNP instructed nursing staff about cervical cancer prevention and screening education. Next, the impact of mother/daughter, language-appropriate education on cervical cancer prevention knowledge and HPV vaccine uptake was studied. The initiative's quasi-experimental design involved 43 participating mother/daughter dyads who received HPV/CC information during small group sessions presented via language-appropriate brochures, English-language HPV/CC video with Spanish subtitles (developed by the DNP), and discussion. A five-minute question and answer (Q&A) portion followed the presentation. Outcome measures included: HPV/CC prevention knowledge level, HPV vaccine knowledge, HPV vaccine uptake intent, and aggregate clinic HPV vaccine administration numbers.

Comparison of nursing staff HPV/CC knowledge measured via pretest and posttest scores indicated an overall 16% HPV/CC disease prevention staff knowledge increase. The mother/daughter educational intervention reflected varied levels of pre-intervention parental knowledge and understanding concerning HPV and cervical cancer regardless of the mother's formal education level or race. Demographic analysis indicated the majority of mothers were Hispanic, with the majority of the Hispanic mothers being Spanish-language dominant. A paired t-test analysis comparison of the mother's pretest and posttest scores measuring HPV/CC prevention knowledge indicated a significant improvement ($p < .05$). The McNemar Chi-Square analysis of the mother's intent to have the daughter receive the HPV vaccine indicated a significant increase ($p < .05$) from non-intent to acknowledging positive HPV vaccine intent post intervention. The aggregate HPV vaccine rate increased from 3% during the three-months prior to the educational intervention to 13% during the three-month cervical cancer prevention initiative.

To enhance cervical cancer prevention, it is important for healthcare providers to impart language-appropriate HPV/CC patient education and provide information regarding benefits and risks of the HPV vaccine. Physicians and advanced practice nurses should educate patients and parents about health promotion and disease prevention including discussions about current recommended vaccines against disease.

Falls Prevention in a South Texas Acute Care Hospital

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The purpose of this study is to formulate a detailed assessment of the microsystem and describe the causes and factors associated with the occurrence of falls in an inpatient care environment to improve patient safety outcomes in a hospital in south Texas.

Falls are the leading cause of inpatient accidents occurring at the rate of at least 2.3 per 1,000 patient days (Lavsá et al., 2010). Studies on falls have also revealed a higher incidence of falls among psychiatric patients, especially among the elderly. Falls among hospitalized patients lead to physical injury in about 30% of patients, resulting in increased healthcare utilization, length of stay (LOS) and hospitalization costs. Statistics show that costs related to falls are exorbitant. In 2000, the cost was estimated to be \$19 billion and by 2020, it is projected to be more than \$30 billion (Knight & Coakley, 2010). Despite the implementation of a number of fall prevention practices, incidence of falls remains high. About 700,000 to 1,000,000 hospital patients in the United States fall each year (AHRQ, 2013). There is therefore a need to embark on a project to reduce the number of patient falls and sustain these efforts.

This ongoing study uses a descriptive retrospective design and is a quality improvement project. A full microsystem assessment will be accomplished using the Dartmouth model and 5 P assessment methods. Data will be collected using administrative datasets and reviewing patient charts to evaluate the rate of falls in the hospital. The investigators (CNL students) are validating compliance of fall prevention (programs/rules and policies) as recorded in the medical charts of the patients to determine any divergences encountered in policy adherence. After analysis of the fall data, the findings will be reported to Nursing Administration. Analysis of data will be performed using SPSS. Descriptive statistics will identify risk factors of falls through mean age, number of medications prescribed, and number of medication changes. The reported findings will describe the documentation of the use of the fall prevention protocol and/or the lack of documentation.

Initial chart reviews reveal lack of compliance with fall prevention guidelines. Based on current findings, predicted conclusions are that staff is non-compliant with fall precautions guidelines. The lack of stratification of fall risks leads to increased incidence of falls in the facility. Preliminary data suggests variation in compliance related to time of day, staffing patterns, and seasonal volumes. New interventions and tools should be aimed at addressing these variations in compliance.

Implementation of Atrial Fibrillation Educational Program in a Military Hospital to Improve Staff Knowledge and Patient Outcomes by Reducing Hospital Readmissions

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The purpose of this project was to improve nursing knowledge on AF management so that the nursing staff could provide better discharge education that would ultimately decrease hospital readmissions. The aim of this project was to decrease hospital readmission rates for patients with AF by providing an organized, evidence based staff education program to nurses taking care of patients with AF so that they could provide disease specific discharge instructions to patients.

Atrial fibrillation (AF) is the most common cardiac arrhythmia of the elderly and is associated with increased rate of stroke. The prevalence of AF is projected to increase to 15.9 million by the year 2050. Medicare spends \$15 billion on hospital readmissions. AF hospital readmission rates are high. Military readmission rate was found to be 33% compared to general public of 26%.

Design-A quasi-experimental design was used to determine if offering a 30-minute education program to nursing staff responsible for providing discharge instruction to atrial fibrillation patients would affect their hospital readmission and mortality rates. Sixty-eight nurses participated in the program. The Atrial Fibrillation Knowledge Scale was used as a pre/ posttest. Charts were reviewed to determine if readmission and mortality rates decreased.

Analysis of data revealed a statistically significant increase in AF knowledge scores from pretest (M=85.69, SD=12.511) to posttest (M=93.25, SD=9.248), $t=4.533$, $df(67)$, $p<.0005$ (two-tailed) indicating nurses learned from the education program. Hospital readmission rates fell to 3.8% which was statistically significant ($p=.007$). Mortality rates dropped from 10% to 3.8% but this change was not statistically significant ($p=.615$).

Results indicate that educating nurses in disease-specific discharge instructions may improve patient outcomes.

Calculation of Minimal Detectable Change of Individual Constructs of a Cultural Competence Measurement Instrument

David S. Fike, PhD, Jason M. Denton, PT, DPT, MS and Shandra Esparza, EdD, ATC, LAT

The Inventory for Assessing the Process of Cultural Competence Among Healthcare Professionals-Student Version (IAPCC-SV) is an instrument frequently used to assess cultural competency. The IAPCC-SV has 5 constructs, but the minimal detectable change (MDC) for the constructs has not been reported. The MDC of a measurement tool is defined as “the minimal amount of change that is not likely to be due to chance variation in measurement”. If pre-to-post change exceeds the MDC, then the change represents meaningful change and not just measurement error. The purpose of this psychometric study is to calculate the MDC of the 5 constructs.

Physical therapist and athletic training education programs are among the health professions programs that include cultural competency components to prepare students for practice in a diverse society and to meet accreditation requirements. The IAPCC-SV measures five constructs of Cultural Competence: Cultural Knowledge, Skills, Attitudes, Desire, and Encounters. As described in the APTA Blueprint for Teaching Cultural Competence many of the classroom activities are designed to facilitate improvements in the domains of Cultural Knowledge, Skills, and Attitude. Calculation of the MDC values for each individual construct of a given tool will allow a more informed interpretation of results and facilitate more precise assessment of the outcomes of educational activities designed to improve students’ cultural competence.

79 doctor of physical therapy (DPT) and undergraduate Athletic Training and Rehabilitation Science (ATHP) students completed the IAPCC-SV. The cultural-competence instrument consists of 20 items with 5 sub-scales (Awareness, Knowledge, Skill, Encounters, Desire). Likert-type responses (strongly agree – 4, agree – 3, disagree – 2, strongly disagree – 1) are summed to derive scale and sub-scale scores. Higher scores indicate higher levels of cultural competence. The IAPCC-SV was administered to 79 students, and 52 students completed a retest 1 week later to allow calculation of the MDC of the IAPCC-SV. Test-retest reliability and MDC were calculated.

For the combined DPT and ATHP group, the MDC₉₅ for the entire instrument is 4.10. The MDC₉₅ of the individual constructs are as follows: Cultural Awareness = 1.34, Knowledge = 2.02, Skill = 1.52, Encounters = 1.61, and Desire = 1.17. The MDC patterns were consistent between the two student groups (DPT and ATHP) for the cumulative assessment tool and across the individual constructs. The results provide educators in physical therapy educational programs and other allied health educational programs with the ability to assess individual domains of learning during the process of achieving cultural competence. Specifically, educators can assess for meaningful changes in Cultural Knowledge, Skills, and Awareness, which are the primary goals of classroom and curricular activities designed to facilitate improvements in cultural competence.

Contact Lens Properties that Improve Visual Acuity

A. Philip Aitsebaomo, OD, PhD, FAAO

The purpose of this research is to identify properties of contact lens design that can predictably improve visual acuity, especially night vision, in adapted soft contact lens wearers.

Adapted contact lens wearers will wear lenses that are chosen based on design properties such as asphericity, water content, and lens elasticity. By measuring high and low contrast visual acuity, we can identify some of the properties, or combination of properties, that lead to improved visual acuity.

Besides contact lens discomfort, poor vision is a significant cause of contact lens dropout by patients who will otherwise prefer to wear contact lenses. Manufacturers have made significant stride in addressing some of the causes of contact lens discomfort by introducing materials that increase oxygen transmission, and reduce dry eye symptoms. By identifying the elements that contribute to improved vision, manufacturers can complete the circle of reducing contact lens dropout by improving the visual acuity of contact lens wearers.

Adapted contact lens wearers wore contact lenses with different properties (water content, asphericity, and modulus of elasticity). Subjects wore the same prescription in all contact lens brands. High order aberration and visual acuity were measured through the lenses. Repeated ANOVA measure was used to analyze differences in performance between contact lens brands.

It appears that low modulus aspheric design, combined with low modulus, appears to result in better low contrast visual acuity (Fig 1) and lower residual spherical aberration (Fig 2). More low modulus aspheric lenses will be tested to confirm this initial finding.

Hands-Free Phone Communication Decreases Throughput on Color and Luminance Tasks

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Jeff C. Rabin, OD, MS, PhD

Researchers sought to determine whether hands-free communication impairs visual luminance and color performance as measured by throughput: the ratio of contrast sensitivity (CS)/response time.

The use of cell-phones while driving has been linked to accidents, injuries and fatalities. Whereas use of hand-held phones is widely banned, hands-free systems are ubiquitous and standard in new vehicles. Yet the impact of hands-free communication on basic visual performance is unclear.

A Netbook computer was used to measure large and small letter black-white CS and cone-specific color CS (red, green, blue). Single letters appeared on the display and the subject used a mouse to select the letter seen from a matching display. A response-driven staircase measured CS and average and threshold response time. 16 subjects with normal color vision and 12 color vision deficient (CVDs) were tested with verbal Communication in which the subject responded verbally (“hands free”) to a simulated phone call broadcast from a Bluetooth device. Communication lasted for the test duration during which the subject answered scripted questions requiring cognition and decision making. Each subject also completed all tests without communication in counterbalanced order. Performance was quantified as throughput: CS/response time.

There was a significant decrease in throughput on all CS tests with verbal communication when expressed relative to average response time (mean decrease = 17%; $F=12.9$, $p<0.0005$) and threshold time (mean decrease = 18%; $F=7.0$, $p<0.01$). The main basis for decreased throughput was increased response time (mean increase = 1/3 sec.; $F=27.8$, $p<0.0001$). With communication 7/12 CVDs showed decreased color CS and many subjects had decreased CS for small targets. Hands-free phone calls decrease throughput for low contrast color and luminance tasks. This performance decrement reflects increased response time as well as impaired sensitivity. These results indicate that hands-free communication during driving poses a formidable threat to safety.

Ubiquitin Carboxyl-Terminal Hydrolase-L1 in Retinoblastoma

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Ubiquitin carboxyl-terminal hydrolase-L1 (UCHL1) is a deubiquitinase (DUB) part of the ubiquitin/proteasome system (UPS). UCHL1 is highly expressed in the nervous system including retina where it has been proposed to have a neuroprotective role. UCHL1 dysfunction has been linked to tumorigenesis. Using human tissue microarrays, we showed that UCHL1 expression was altered in retinoblastoma compared to normal retinas. Additional work from our group, suggested a role for UCHL1 in glioblastoma cancer stem cells. Cells with stem-like properties have been identified in retinoblastoma but little is known regarding the mechanisms regulating their proliferation and maintenance. To determine the effects of UCHL1 aberrant expression in retinoblastoma, we knocked-down UCHL1 in human retinoblastoma cell lines Y79 and Weri-Rb-1 and measured invasiveness and expression of stem-cell markers in these knockdowns (KDs) compared to control retinoblastoma cell lines.

Retinoblastoma is the most common pediatric ocular malignancy. A combination of early diagnosis and more effective therapies is needed to improve patients' quality of life such as eye salvage, vision preservation, lessen sequelae. Data generated from this study may help us in the search for new potential markers and therapeutic targets in retinoblastoma.

Y79 and Weri-Rb1 retinoblastoma cell lines were from the American Type Culture Collection (ATCC). UCHL1 protein levels were measured by western blot using precast 4-15% polyacrylamide gradient gels (Bio-Rad), a rabbit-polyclonal antibody and a HRP-conjugated secondary antibody (Cell Signaling Technology®). Beta-actin expression was used as control for normalization. Band densitometry was measured using AlphaView®. UCHL1 was knockdown in Y79 and Weri-RB-1 retinoblastoma cells using a lentiviral infection system from GeneCopoeia™. Infected cells were selected using puromycin (1.5 ug/mL). Three single-cell clones were isolated from each infection and expanded to be used as biological replicas in the cell-based analyses. As negative control, retinoblastoma cells were infected with a short hairpin construct against GFP. Cell invasion analyses were performed using CytoSelect™ 24-Well Cell Invasion Assay (Cell Biolabs, Inc.) according to manufacturer's instructions. The amount of cells that were able to degrade the matrigel and to migrate through it (i.e. invasiveness) was quantified by absorbance at 560 nm using a plate reader. APC-labeled antibody against CD133 surface marker was from Miltenyi. As control, isotype IgGs conjugated to APC (Miltenyi) were used. Flow cytometry analyses were performed with a FACSCanto II (Becton Dickinson). Viable cells were gated using propidium iodide.

High levels of UCHL1 protein were found in Y79 and Weri-RB-1 cells as they expressed, respectively, 50% and 75% more UCHL1 than the reference lung cancer cell line A459 (positive control). UCHL1 knockdown was confirmed in Y79 and in Weri-Rb-1 infected cells both at the mRNA and protein levels.

CD133 surface marker was expressed in 10% of Y79 cells and in most Weri-Rb-1 cells (~89%). The results of ongoing experiments that aim to determine the effects of UCHL1 KD on retinoblastoma cancer stem cell markers and on invasiveness will be presented.

Nitric Oxide in Diabetic Retinopathy

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We tested the hypothesis that a chronic increase in NO production in diabetic retina will protect the retina from retinopathy.

Diabetic retinopathy, the leading cause of blindness in working age Americans, is a microvascular disease beginning with endothelial cell (EC) injury and loss. Mice heterozygous for the Akita mutation of the Insulin2 gene (Ins2Akita mice) develop diabetes after 1 month of age and subsequent retinopathy. The retinas of these mice exhibit decreased ocular blood flow, increased ocular vascular permeability, and retinal inflammation. A decrease in thickness of the retinal layers has been reported in these mice due to loss of retinal cells, including ECs, amacrine neurons, and retinal ganglion cells (RGCs). Because EC loss decreases NO production, which would cause chronic vasoconstriction and the observed reduction in ocular blood flow, we hypothesize that chronic restoration of NO production in the retinal vasculature would ameliorate the cell and neuron loss in the diabetic retina.

Diabetic and littermate control Ins2Akita mice were fed a diet which increases production of the vasodilator nitric oxide (NO) in ECs. The additives were L-arginine (L-Arg), the substrate used by NO synthase (NOS) to produce NO, and sepiapterin (Sepiap), an analog of tetrahydrobiopterin, a necessary enzymatic co-factor for NOS. Groups of diabetic mice were fed either normal chow (no additives; n=2) or 2) chow containing L-Arg and sepiapterin (n=3). A group of non-diabetic control mice was also fed a normal diet (n=3).

The mice were sacrificed after a treatment period of 3 months from the beginning of hyperglycemia. Whole eyes were fixed using Davidson's fixative. Eyes were embedded in paraffin, and vertical sections through the optic nerve head were sectioned onto slides and stained with hematoxylin and eosin (H&E) (Excalibur Pathology, Inc.). The entire neural retina from each eye was digitally imaged at 20x magnification. Peripheral, mid-peripheral, and central locations were determined in both the inferior and superior retina based on a set percentage of the retinal length from the optic nerve head. At these locations, multiple manual measurements of the thicknesses of the retinal layers (including ONL, OPL, INL, and IPL, as well as the sum of these layers as a measure of total thickness) were made, and the number of RGCs per unit distance was counted for retinas from each of the treatment groups.

Essentially no statistically significant differences in layer thicknesses or RGC counts were found. Total retinal layer thicknesses from peripheral retina were (mean \pm SD, in μ m): 162.3 \pm 13.5 (non-diabetic mice, control diet), 165.5 \pm 5.9 (diabetic mice, control diet), and 161.4 \pm 7.8 (diabetic mice, L-Arg + Sepiap diet). Thus, the outcome measure itself, consisting of significantly reduced retinal layer thickness and RGC loss previously reported for diabetic Ins2Akita mice, was not observed in this pilot study, making it impossible to see restoration of these layer thicknesses by the treatment. Thus, the treatment neither improved nor worsened the disease condition by these outcome measures of retinal layer thicknesses and RGC counts from peripheral, mid-peripheral, and central retina.

Contrast Sensitivity Measurement with a Windows 8 Tablet Display

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Jeff C. Rabin, OD, MS, PhD

The objective of this protocol was to determine whether contrast sensitivity can be measured accurately with a Windows 8 tablet display.

It is well established that the ability to detect and recognize low contrast targets often decreases earlier and more rapidly than high contrast vision (e.g., visual acuity) in various ocular conditions and diseases as well as in systemic and neurological disease. Hence it is incumbent upon the eye care professional to utilize low contrast testing. Contrast sensitivity (CS) measures the lowest detectable contrast for patterns of various sizes. While CS is classically measured with sine wave gratings, various CS letter charts exist. The most well-known and widely used letter chart is the Pelli-Robson (PR) which uses large letters which decrease in contrast as one reads down the chart. PR scores have been linked to facial recognition and remain very useful for quantifying CS. However, the PR is a large wall-mounted chart which requires specific overhead illumination. With increasing longevity and emphases on home and remote medical monitoring, portable measures of CS are needed. We describe measurement of CS using a Windows 8 tablet display which yields results comparable to the PR test.

CS was measured in 27 visually normal subjects on a Windows 8 tablet using a program available from Innova Systems, Inc. Single letters appeared in the center of the display and the subject used an adjacent touch-screen matching display to identify the letter seen. Contrast was varied up and down in staircase fashion (like a hearing test) to rapidly measure CS. Results were compared to PR test scores.

There was no significant difference between test (PR vs. tablet, $F=3.2$, $p=0.8$) and subject eye (right vs. left, $F=0.02$, $p>0.8$). Mean differences between tests were less than one letter read correctly. The Windows 8 tablet program can be used to accurately measure CS with results comparable to the PR test. Portability, automated scoring, wireless communication from remote sites as well as transfer to electronic medical records make the Windows 8 CS test highly viable for future applications.

Effects of Hands-Free Phone Communication on the Pattern Visual Evoked Potential

Andrew Kryder, BS and Dan Lam, BS, Optometry Students
Jeff C. Rabin, OD, MS, PhD

The purpose of this study was to determine if simulated hands-free phone calls impact pattern visual-evoked potentials (VEP).

The National Safety Council estimates that ¼ of all auto accidents are directly attributable to use of cell phones when driving. Our previous research showed significant increases in subject response time to perform low contrast black-white and color recognition tasks when required to communicate on a hands-free call during testing. In this study our purpose was to determine if this performance decrement can be detected in the pattern VEP which occurs within 1/10th of a second following stimulation.

The VEP is an objective measure of central vision (e.g., visual acuity) recorded from skin electrodes from the back of the head adjacent to the primary visual cortex of the brain. The Diopsys® standard VEP program, which measures VEPs at high and low contrast, was used to assess performance in 20 visually normal subjects. This test includes both high and low contrast VEPs and automatically records VEP latency (time from stimulus to response) and amplitude (VEP size in microvolts). VEPs were recorded from each subject with and without verbal communication in counter-balanced order. Verbal communication required that the subject answer scripted questions requiring cognition and decision making.

Within-subject repeated measures ANOVA revealed no significant parametric effect of verbal communication on VEP latency ($F=3.1$, $p=0.09$) or amplitude ($F=0.9$, $p>0.33$). However, at low contrast 10 subjects showed non-recordable VEPs with verbal communication compared to six subjects without communication. These results indicate that, in most cases, the adverse effect of hands-free phone calls on visual performance occurs at a higher cortical level than that revealed by the VEP. However, some subject show significant decrements in the low contrast VEP suggesting greater susceptibility to verbal distraction.

Evaluation of a Disposable Skin Electrode for Flash Electroretinograms

Dan Lam, BS, and Andrew Kryder, BS, Optometry Students
Jeff C. Rabin, OD, MS, PhD

The purpose of this study was to evaluate the efficacy of the Diopsys[®] electroretinogram (ERG) disposable infra-orbital skin electrode for measuring and quantifying flash ERGs.

The flash ERG is an objective, electrophysiological measure of retinal function. It is used for diagnosis of various diseases including retinitis pigmentosa (night blindness). It is typically recorded with a contact lens or filament (DTL) electrode placed on the eye in accord with standards established by the International Society for the Clinical Electrophysiology of Vision (ISCEV; <http://www.iscev.org/>). Some patients are unable to tolerate an electrode on the eye; hence it would be useful to use a skin electrode near the eye to record the ERG. Hence we evaluated the recently developed Diopsys[®] skin electrode, a disposable, conductive adhesive strip applied directly below the eye, by comparing it to the DTL filament electrode for recording ERGs.

A Ganzfeld stimulus was used to record ISCEV standard full field flash ERGs from ten visually normal subjects under dark-adapted and light-adapted conditions. ERGs were recorded simultaneously from the Diopsys[®] skin electrode placed immediately below the eyelid and DTL filament electrode placed on the white of the eye. This allowed direct within-subject comparison of ERG amplitudes and latencies (implicit times) from the same eye of each observer.

As expected ERG amplitudes were smaller with the skin electrode compared to the DTL standard electrode with skin electrode amplitudes ranging from 60% – 80% of those obtained with the DTL electrode ($p < 0.01$). However, ERG waveforms were identical from skin and DTL electrodes and there was no difference in implicit times for all components of the ERG ($p > 0.4$). These results indicate that the Diopsys[®] disposable skin electrode can be used effectively to record full-field flash ERGs in accord with ISCEV standards. A larger subject pool will be necessary to establish definitive amplitude norms but current results support application of a 60% amplitude attenuation factor when using the skin electrode.

Conquering Contact Lens Discomfort: Are Lipid-Based Artificial Tears the Solution?

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The primary goal of this investigation is to determine if lipid based artificial tear supplementation has an impact on contact lens discomfort (CLD). We compared the CLD of three groups of subjects. 1. Treatment with a lipid based artificial tear, Systane® Balance [Alcon Laboratories, Inc., Fort Worth, Texas, USA;]; 2. Treatment with a non-lipid based artificial tear, Systane® Contacts [Alcon Laboratories, Inc., Fort Worth, Texas, USA;]; and 3. Saline (used here as a “placebo”). Dry eye signs were also assessed. We will report our preliminary findings of 30 subjects for our ongoing investigation. 60 subjects shall complete this study.

Contact lens discomfort is the most common cause of discontinuing contact lens wear. Despite years of research and innovations in technology, CLD remains highly prevalent, and thus it is a major concern for patients and practitioners. Studies suggest that meibomian gland dysfunction (MGD) is a cause of CLD. Several lipid-based artificial tears have recently been designed to address dry eye associated with MGD. In this study, we examine if the benefits of lipid based artificial tears extend to improving contact lens comfort. Studies have demonstrated some usefulness of non-lipid based tear supplements in the management of contact lens discomfort. However, the relief was moderate and short-term. To our knowledge, no study has examined the impact of lipid based artificial tears on contact lens discomfort. In this study, we will address this gap in knowledge.

30 subjects with mild to moderate contact lens discomfort completed a randomized double-masked study. Subjects were sorted into 3 groups of 10 that instilled Systane® Balance, Systane® Contacts, or saline 2 times per day for 30 days. A 1-week washout period with saline was performed before the test period. A contact lens discomfort questionnaire and tear break-up time (TBUT) measurements were administered at baseline and 1 month post-treatment. Paired and un-paired t-tests were used to assess within and between group differences.

There was no significant difference between groups for the effectiveness measures at baseline ($p>0.5$). Systane® Balance, Systane® Contacts, and saline resulted in a significant improvement in CLD symptoms at 1 month ($p=0.006$, $p=0.02$, $p=0.02$ respectively). However, Systane® Balance resulted in a significantly greater improvement in CLD symptoms than Systane® Contacts and saline ($p=0.02$) at 4 weeks post-treatment. Systane® Balance resulted in a significant improvement in TBUT at 4 weeks ($p=0.02$). In contrast, there was no significant change in TBUT for Systane® Contacts and saline ($p=0.4$ and 0.5 respectively). Systane® Balance resulted in a significantly greater improvement in TBUT ($p=0.01$) than Systane® Contacts and saline.

There was a substantial reduction of CLD with the lipid based artificial tears, and these tears were significantly more effective than non-lipid based artificial tears in reducing CLD. Our preliminary results suggest that lipid based artificial tears may be a viable option for CLD management.

Objective Diagnosis of Color Vision Deficiency with Visual Evoked Potentials

Jeff C. Rabin, OD, MS, PhD,
Dan Lam, BS, and Andrew Kryder, BS, Optometry Students

Hereditary color vision deficiency (CVD), present in 8% of males and 1/200 females, can impair performance and delay reaction time in settings with limited visual cues. CVD also can be acquired as an early sign of ocular, systemic and neurological disease. While most color tests detect hereditary CVD, few diagnose type and severity of CVD, important for linking performance to occupational demands and/or confirming the presence of disease.

The Cone Contrast Test (CCT) is a computer-based color test used USAF-wide which identifies type (red, green or blue) and severity of CVD. The CCT uses colored letters visible only to red, green or blue sensitive retinal cones and determines the lowest color contrast the observer can see. While the CCT is readily administered in 5 minutes, some patients, including infants, elderly and those with cognitive impairments, are unable to respond to subjective testing. Hence an objective measure of color vision with sensitivity and specificity comparable to the CCT would be useful.

The visual-evoked potential (VEP) is a non-invasive test of central vision in which a recording electrode is placed on the back of the head while the observer views a checkerboard pattern which generates a VEP each time it comes on or reverses on a computer display. Our purpose was to develop and validate a cone-specific VEP for assessment of red, green and blue color vision.

An FDA-approved Diagnosys LLC VEP system, which includes a high resolution color LCD display, was used to generate red, green and blue cone specific patterns based on rigorous measurement of luminance and CIE chromaticity using a Spyder-4 colorimeter and transforming these values to cone contrasts. VEPs were recorded from 17 color vision normal (CVN) subjects and 11 CVDs confirmed with a battery of color tests.

The cone-specific VEP showed 100% sensitivity for detection and diagnosis of CVD and 100% specificity for confirming CVN. Green CVDs showed a significant increase in green VEP latency (mean increase = 36.4 milliseconds, $p < 0.001$) and decrease in amplitude (mean decrease = 6.8 microvolts, $p < 0.05$) compared to CVNs but normal red and blue VEPs ($p > 0.55$). Red CVDs showed a significant increase in red VEP latency (mean increase = 60.2 milliseconds, $p < 0.0005$) and decrease in amplitude (mean decrease = 8.8 microvolts, $p < 0.001$) compared to CVNs but normal green and blue VEPs ($p > 0.29$).

Cone specific VEPs offer a sensitive objective measure of color vision which readily diagnoses hereditary CVD and shows potential for detecting sub-clinical acquired CVD in various diseases and brain injury.

Correlation of Short-Duration Transient Visual Evoked Potential (SD-tVEP) with Perimetric Staging in Chronic Glaucoma

William Sponsel, MD, Richard Trevino, OD, Carolyn Majcher, OD, Sylvia Groth, MD, and Joseph Allen, Optometry Student

The purpose of the study was to assess rates of abnormal SD-tVEP amplitude and latency findings in adults with chronic glaucoma using the Diopsys Nova-LX.

The visual evoked potential (VEP) is an objective measure of visual function that assesses the electrical activity of the cerebral cortex using electrodes placed on the scalp while the subject views standardized visual stimuli. The short duration transient VEP (SD-tVEP) decreases test duration substantially by means of synchronized signal acquisition in combination with a post-processing technique that provides less subjectivity in waveform assessment. Pillai et al has recently reported on the ability of the SD-tVEP to objectively discriminate between normal and glaucomatous eyes. This technology may enhance our ability to diagnose glaucoma and stage its severity.

143 eyes of 88 adults with chronic glaucoma staged as mild (HVF 30-2 MD >-6dB), moderate (<-6 MD >-12dB) or severe (<-12dB) underwent SD-tVEP testing using both 85% contrast reversal pattern (Hc) and 15% contrast (Lc) pattern stimuli. An index was constructed of both amplitude and latency findings for each tested eye using the instrument's analysis of the results as within expected limits (index = 0) or not within expected limits (index = 1). Paired t-tests were used to compare Hc vs Lc deficits.

A total of 71 mild, 25 moderate and 47 severe glaucomatous eyes were evaluated. Mean age (68.1±13.2) was consistent across subgroups. Amplitudes were reported as normal in over 85% of eyes and not significantly different between staged subgroups. The frequency of Lc and Hc latency abnormalities were strongly correlated with mean subgroup MD (Lc: $r^2 = 0.923$; Hc $r^2 = 0.935$), but Hc latency deficits were far more common. The rate of abnormal latency results for Lc stimuli were 8.1%, 13.3% and 38.2% in mild, moderate and severe glaucoma, respectively. The corresponding rates for Hc stimuli were 22.5%, 43.1% and 53.9% ($p = 0.0002$). This study confirms that SD-tVEP latency increases with disease severity, but shows a much stronger tendency for that abnormality to arise with Hc stimuli than with the Lc pattern. This Hc>Lc latency defect preponderance was large and present at all stages of glaucoma. These findings suggest that Hc abnormal latency may be a more sensitive indicator of glaucomatous damage than other SD-tVEP variables.

Survival Analysis of Water Main Breaks as the Answer to the Repair-or-Replace Dilemma, a Case Study

Joleen Beltrami, PhD, Shayn Weidner, USAA, Jesus Cuellar, PhD, Consultant

Water management has far-reaching economic, legal, technical, political and institutional implications. This work presents a mathematical model to determine whether it is more financially responsible to replace or repair a water main following a break. The outcome of the cost/benefit analysis will assist water companies in making an economically sound decision to this repair-or-replace dilemma.

Due to the extreme heat in Texas during the majority of the year, water conservation is essential. This study focuses on three neighborhoods under the control of the San Antonio Water System (SAWS). The resulting model can assist SAWS, as well as other water companies, in determining which variables will affect pipe life, and help in predicting remaining pipe life so as to determine the optimal time to replace a pipe, i.e., the optimal number of breaks and repairs before replacing. It expands upon models currently in the literature by using previous number of breaks as a covariate; the model is more prescriptive in application and explicitly accounts for lifetime trends. The structure of the model can be applied to a variety of additional situations and disciplines.

This study used data already maintained in SAWS' main database. Data included information on pipe length, pipe diameter, soil and grade of pipe location, number of previous breaks, days since last break, and neighborhood. There were originally 9290 records resulting in approximately 8800 observations after data cleaning, which encompassed three neighborhoods, 17 soil types and grades, five pipe materials, three intervals of length, and several pipe diameters. We conducted a survival analysis by utilizing a Cox Proportional Hazards model to predict lifetimes of the pipes. We then constructed present value equations using median lifetimes in order to perform a cost/benefit analysis to recommend repair or replacement. A case study using 1032 observations was performed on one pipe type (asbestos cement) in one neighborhood (Pecan Valley) to illustrate the usefulness of the model.

The model presented here assumed a fixed pipe material and fixed replacement and repair costs. However, this flexible model can be adapted to include changes in pipe material as well as changes in the cost structure.

The basic construct of the model has many applications in survival and reliability analysis, which includes applications to life estimates of machines, persons, or animals. The addition of the cost/benefit component in the model extends its usefulness beyond simply predicting lifetimes of the subjects; it allows for financially sound replace-or-repair decisions to be made based on these lifetime predictions.

robo-roach: Biologically-Inspired Robots using the Lego Mindstorm EV3

Erik M. Coronado, Biology Student, Sreerenjini Nair, PhD, and Michael T. Frye, PhD

This research focuses on developing a simple algorithm based on simple insect behavior that is expected to be more efficient than the one currently existing for analyzing the behavioral properties of biological robots.

The application of biologically inspired engineering is of growing interest because of its potential applications in biology, engineering, education and various other disciplines. Our robo-roach is a biologically-inspired Lego EV3 robot that exhibits behavior observed from its natural counterpart by utilizing a simple algorithm created from analyzing the behavior of real roaches. In the study of biological complex systems, the “bottoms-up” approach towards complexity is an effective tool for understanding how emergent behavior manifests itself through the swarm intelligence of a group of organisms. This approach lends itself nicely to helping us understand how an individual, unsophisticated organism can exhibit rudimentary behavior whereas a group of these individuals can exhibit sophisticated emergent behavior.

We have performed an insect behavioral, such as foraging behavior and navigation behavior, analysis to obtain data of significant behavioral patterns of the roach. With these patterns of behavior, we have constructed a simple algorithm that accurately represents the behaviors observed in our animal behavior analysis. This simple algorithm is being written using the MATLAB/Simulink Program and then transferred to the Lego Mindstorm EV3 which will allow the robo-roach to behave like their natural counterparts.

We anticipate observing similarities in emergent behavior between the robo-roach and the regular roaches. We will integrate data using our algorithm obtained from the collected qualitative data to build a biologically inspired robot that emulates roach behavior. This project is supported by the Undergraduate Research Award (UGRA) and the preliminary results will be presented at the 2015 American Society for Engineering Education (ASEE) Gulf Southwest (GSW) conference during the spring of 2015. We will create and present a poster to disseminate our findings.

This research was partially supported by an UIW Undergraduate Research Award and grant Proposal No. 64685-EG-REP from the Air Force Office of Scientific Research.

Direct Inverse Control using an Artificial Neural Network for the Autonomous Hover of a Helicopter

Michael T. Frye, PhD and Sreerenjini Nair, PhD

This abstract presents the initial results of a research project which investigates the application of the Direct Inverse Control technique to the problem of the Autonomous Hover of a quadrotor UAV Helicopter. The goal of the project is to investigate the effectiveness of the Direct Inverse Control technique using an Artificial Neural Network to learn and then cancel out the Hover dynamics of the quadrotor UAV Helicopter under various environmental conditions during a hover.

Research in the area of UAVs has grown in importance over the last two decades as the operational requirements for such vehicles have increased in both military and civilian sectors. As the role of the UAV increases, the need for improved autonomous guidance, navigation, and control algorithms has become increasingly crucial. Controllers for helicopters have been designed predominantly by classical control techniques. While this has produced many highly reliable and effective control systems, recent years have seen a growing interest in the use of robust, nonlinear adaptive control theory for flight control. A particularly important area of interest is the application of robust nonlinear control techniques to flight dynamics and control of rotorcraft UAVs. In response to this need, the UIW Autonomous Vehicle Systems (AVS) Laboratory is investigating new techniques to flight controls on unmanned rotorcraft dynamics. The overall mission of the AVS Laboratory is to determine the effectiveness of the stabilizing and robustness properties of nonlinear control design techniques on autonomous rotorcraft vehicles.

Direct Inverse Control is a simple technique to implement and control nonlinear dynamics. The flight dynamics of a helicopter is by its nature very nonlinear and sensitive to inputs and disturbance. The Direct Inverse Control technique was coupled with an Artificial Neural Network (ANN) in order to design a control system which could adjust and adapt to changes in the system dynamics and be robust to uncertainty in its environment. For this research project, the ANN was taught the correct dynamics of a helicopter in a hover hold using flight test data from the Qball-X4 helicopter. The Direct Inverse Control objective was to attempt to cancel out the dynamics of the hover motion such that the only command left was the hover command. The Direct Inverse Control technique coupled with an ANN was chosen as a controller because it is simple to implement within the software constraints of the flight control computer and the controller can be tuned to changing state parameters using the ANN.

This research is still ongoing; however the initial research is promising. An ANN was trained using hover flight test data in MATLAB/Simulink software. The Direct Inverse Control technique is able to hold a hover in simulation using flight test data. The next phase will be to test it on the Qball-X4 helicopter. The results will be applied to the next phase which will be the study of autonomous hover with swaying cargo.

This research was partially supported by an UIW Faculty Endowment Research Award and grant Proposal No. 64685-EG-REP from the Air Force Office of Scientific Research.

The Role of Rad52 in Class Switch DNA Recombination and the Antibody Response

Kevin D. Gonzalez, BS, Connie Tat, PhD, UTHSCSA, and Ana C. Vallor, PhD

Upon exposure to genotoxic agents, DNA double stranded breaks (DSBs) are harmful to any organism. DSBs can cause deleterious mutations within an organism's genome that could lead to apoptosis, B cell neoplasia, and diseases and syndromes associated with impaired reparation of these breaks. Organisms have evolved to acquire different repair mechanisms that lead to the annealing of DSBs and which restore the integrity of a cell's genome. Class-switch DNA recombination (CSR) is one of the DSB repair mechanisms used by B cells to increase the diversification of antibody isotypes and antigen specificity. Upon encountering an antigen, resting naïve B cells become activated and can proliferate and differentiate directly into plasma cells, where large volumes of antigen specific antibodies are secreted. With DSB repair, B cells cannot undergo CSR, thereby affecting an organism's immune response to recognizing and defending against antigens.

There are currently two well established DSB repair mechanisms: non-homologous end joining (NHEJ) and alternative-end joining (A-EJ). NHEJ is the predominant repair pathway used by B cells and is less prone to produce microhomologies. In the absence of NHEJ core factors, the cell shifts towards A-EJ pathway, which inserts microhomologies and removes base pairs to align the broken strand before annealing. These microhomologies used by the A-EJ pathway are fallible and continuously introduces deletion mutations in the genetic code. Previous studies have shown an increase of microhomologies in Ku70/Ku86 knock out mice (Tat, C. et al., J. Immunol, 2014, to be submitted). There has been evidence indicating that a substantial amount of CSR does occur in the absence of Ku70 and Ku86 binding proteins, suggesting other Ku70/Ku86 independent pathway is at work (Boboila et al., 2010 J Exp Med 2: 417-427). It has been suggested that Rad52 may play a role in A-EJ pathway through a mechanism that is likely to bind single stranded DNA ends with homologies leading to microhomology mediated DNA recombination.

Defining the role of Rad52 in CSR and the mechanism behind it will allow for a more detailed understanding of alternative repair methods used by B cells in CSR, which is essential for the maturation of the antibody response to infectious agents, vaccines and tumor cells, and critical for the diversification of antibodies.

Genomic DNA was obtained from p53^{-/-}Rad52^{-/-} and p53^{-/-}Rad52^{+/-} B cells and stimulated with LPS plus IL-4 for 4 days to induce CSR. Using locus specific primers, IgH and c-Myc, the obtained DNA was amplified using nested PCR reactions under different thermocycling conditions. The amplified products verified by Southern Blotting using IgH- and c-Myc-specific oligonucleotide probes in order to detect the presence of sought genes. To analyze the chromosomal translocations, the PCR products were cloned and sequenced for c-Myc and IgH using NCBI BLAST.

Rad52 will introduce microhomologies leading to chromosomal translocations (CT). CT are suggested to be reduced in Rad52^{-/-} compared to wild type mice. CT could lead to genomic instability, therefore this is a "backup" repair mechanism, which leads to substantial but reduced CSR. Increases in CSR have been exhibited in mice due to possible increase of Ku70 recruitment in the absence of Rad52.

Hyperglycemic-Induced Gene Expression Changes in Brain Tissues in a Rat Model of Type 2 Diabetes

Elizabeth P. Gutierrez, Biology Student, Carlos A. Garcia, PhD, Jessica M. Ibarra, PhD

The purpose of this study was to test the hypothesis that hyperglycemia alters circadian genes in the brain tissues in a rat model of T2D.

Diabetes affects the functioning of the central nervous system. Pathophysiological abnormalities including cognitive impairments are well documented in diabetics, particularly those with poor glycemic control resulting in high blood sugar events. The amygdala and hippocampus are brain regions that regulate vital neurocognitive functions such as memory and emotions, while the hypothalamus links the brain to the endocrine system, which secretes hormones into blood. Recent evidence suggests that deregulation of circadian function affects metabolic processes such as insulin-glucose imbalance that can occur in diabetes. Studies have examined clock gene expression in the brain of animal models of human type 1 diabetes mellitus, however few have examined clock genes in the more common type 2 diabetes mellitus (T2D). The significance of this work is that it presents evidence that may link cognitive dysfunction to circadian disruptions in the T2D central nervous system.

Age and sex-matched rats were separated into two groups, control and Zucker Diabetic Fatty rats (ZDF), an animal model of human T2D. Three months after the onset of hyperglycemia in the ZDF rats, the amygdala, hippocampus and hypothalamus of both rat groups were dissected using the atlas of Paxinos and Watson as a guide, and used for biochemical analysis. The tissues were homogenized and the RNA precipitated. The RNA concentration was measured and used to synthesize complimentary DNA (cDNA) by polymerase chain reaction. The cDNA was used to measure the gene expression of the circadian genes *Bmal1*, *Clock*, *Period 1*, and *Cryptochrome 1* by RT-PCR.

The major findings of this study include: i) the core clock transcripts were altered in the diabetic brain areas tested and ii) the changes in gene expression may contribute to cognitive deficits seen in human diabetics and linked to hypothalamus-controlled hormonal deregulation. The results of this work may lead to identification of drug action sites that ameliorate circadian impairments in abnormal glucose metabolism.

Synthesis and Characterization of Ground and Excited State Properties of [Ru(tpy)(bpy)(CF₃-py)]²⁺

Jamsen Hale, Chemistry Student and Robert N. Garner, PhD

The purpose of this study is to synthesize Ru(tpy)(bpy)(4-CF₃py)]²⁺ (**1**), where tpy = 2,2':6'2''-terpyridine, bpy = 2,2'-bipyridine, and 4-CF₃py = 4-trifluoromethylpyridine, and to compare its ground and excited state properties to the previously synthesized complex [Ru(tpy)(bpy)(py)]²⁺ (**2**), where py = pyridine.

Ruthenium(II) polypyridyl complexes have received a great deal of interest due to their ground-state, excited state, and redox properties, which make them ideal candidates for use in dyes-sensitized solar cells, as catalysts for photoactive reactions, and as photodynamic therapy (PDT) agents. New compounds with different capabilities are required to improve current technologies. Electronic absorbance and emission of the complexes, which account for these capabilities, can be tuned by changing the coordination sphere around the central metal atom. To this end, new complexes with varying ligands were investigated.

Ruthenium complexes were synthesized using methods in agreement with literature of similar complexes. The structure of the complex was elucidated using proton nuclear magnetic resonance. Electron absorption and emission spectra were obtained to examine the excited state properties of the complex.

The electronic absorption spectra shows a blue shift of the singlet metal-to-ligand charge transfer (¹MLCT) and emission spectra also shows a blue shift in the triplet state emission of **1** when compared to **2**. This data indicates that the electron withdrawing trifluoromethyl group in the para position of the pyridine ligand has a slight stabilizing effect on the Ru(dπ) t_{2g}-type orbitals.

Isolation of *Lactobacillus gasseri* and *Lactobacillus acidophilus* in Over-the-Counter Probiotics, and Fermented Foods

Timothy R. Hover, BS, Nathan Sosa, Biology Student, Fily Vidrio, Biology Student, Ana C. Vallor, PhD

The purpose of this study was to isolate *Lactobacillus gasseri*, and *Lactobacillus acidophilus* from selected over the counter probiotic formulations and foods. The aim was to recover and check viability and concentration of the bacteria and assess the effectiveness of the advertised dose.

With over 60 species, the genus *Lactobacillus* is the largest genera in the *Clostridium* subphylum of the Gram-positive bacteria. This particular species is found throughout nature, in a multitude of foods, as well as human digestive and reproductive tracts. In this study the organisms that are being closely investigated are *Lactobacillus gasseri* and *Lactobacillus acidophilus*, which has been isolated from the intestinal environment of animals and humans. Even though *L. gasseri* and *L. acidophilus* have been discovered to be beneficial in intestinal health and immunity, factual evidence is sparse as to the bacterial benefits or probiotic activity as a function of shelf life. With the purification and characterization of both *Lactobacillus* strands, from fermented Greek yogurt and a selected probiotic complex with the related strains, we can determine viability and growth of bacteria in over-the-counter products and foods. A probiotic complex is a dietary supplement that contains live bacteria cultures for the purpose of improving digestion. Once the research is successfully completed, it could then provide lucrative possibilities for the potential management and aid of intestinal health, boost in immunity, and weight management.

Various approaches will be used for the purification and characterization of *L. gasseri* and *L. acidophilus*. Supplements to be tested are TruBiotics[®], HEB Probiotic Colon Support[®], and HEB Probiotic Formula Acidophilus[®]. Additionally, plain Greek yogurt will also be tested. The isolation and characterization of *Lactobacillus gasseri* and *Lactobacillus acidophilus* will be determined by using normal protocol, which includes the use of de Man, Rogosa and Sharpe (MRS) and brain heart infusion (BHI) broth and agar. The characterization of the isolated bacteria will be determined through morphology of culture, bright field microscopy, and polymerase chain reaction (PCR). Initially, if growth is obtained, number of cultures will be recorded, slides of the culture(s) will be prepared, and gram stained in order to determine rather or not the bacterium is of the *Lactobacilli* species, which would show gram-positive, rod-shaped bacteria. Furthermore, real-time PCR assay will be used, the assay developed here might become a convenient tool enabling an accurate, fast and sensitive detection of probiotic lactobacilli commercially used in both greek yogurt and probiotic supplements.

The study is currently ongoing however preliminary results have been determined. It has been determined that within each probiotic complex there is viable growth of a *Lactobacillus* species. It was determined that Trubiotics[®] uses yeast within its complex that competes with the growth of *Lactobacillus*. The question remained to be unanswered; what is the purpose of the yeast in the complex? Additionally, we would like to determine whether or not the type of supplement, capsule or tablet, is superior for bypassing the acidic environment of the stomach. Future studies will entail real-time PCR, mimicking the acidic environment of the stomach.

Thinking like a Scientist – Being a Scientist: A Survey of Undergraduate Research – Professional & Personal Gains

Veronica G. Martinez-Acosta, PhD

Studies have demonstrated application of knowledge through undergraduate research experiences in STEM results in positive gains for both the student and the faculty mentor. The success of a program can be correlated to the quality of mentorship provided. Increasingly demanding roles played by faculty across campus, especially at predominantly undergraduate institutions (PUIs), necessitate the use of practical models for maximizing the mentoring experience. Minority serving institutions face added challenges of serving populations of underrepresented minorities (URMs) that often do not carry strong science identities or exhibit high self-efficacy. While there is growing evidence in the literature that undergraduate research programs provide collaborative, mentoring, and empowering environments that develop self-confidence and often result in increased success post-graduation, little is understood about how these experiences affect URMs.

Undergraduate students who worked in my laboratory over a 7-year period (August 2008 to August 2014) completed the survey. The overall response rate for the survey was 71% (15 of 21). Each student received a survey tool designed by the University of Colorado-Boulder called URSSA. URSSA is an online survey instrument for use in evaluating student outcomes of undergraduate research (UR) experiences in the sciences. The respondents were **largely post-baccalaureate** in standing (**10 of 15**) with a few **seniors (5 of 15)**. 48% of the respondents were **female (10 of 15)** with 24% of the respondents being **male (5 of 15)**. Students completing the survey attended or have attended the University of the Incarnate Word, a Hispanic Serving Institution (HSI), thus a large percentage of the students designated their Ethnicity as Hispanic or Latino (**57%**).

I have mentored 21 students in the 7 years that I have participated in undergraduate research. In that time, I have utilized 2 types of mentorship styles – the ‘jigsaw approach’ and a more traditional approach. The traditional approach was carried out with more than half of my students and consisted of a systematic approach to mentoring where each student completes a set of course-work before entering the lab and then learns all techniques in the lab one at a time over multiple years. Students mentored using the ‘jigsaw’ approach were paired in learning groups of 2 or 3. Each individual was trained separately on one technique and then subsequently trained their group members after mastery of the technique. Students often continued to work on main lab projects as a part of a group/team until the end of their tenure in the lab. These two approaches resulted in students that were equally confident in their skills and in their abilities and fostered collegiality amongst peers within the lab. Moreover, students expressed personal gains which included self-confidence and ‘belief in themselves’ that further advanced their career success post-graduation. Overall, the 15 respondents experienced positive outcomes or gains from their research experiences which they perceived positively affected their success post-graduation and strengthened the possibility that they would consider a research program as a part of their profession.

We would like to expand this survey of undergraduate research to include students from across the university and across STEM disciplines. This data will directly address the national imperative for the improvement of number of students completing advanced scientific degrees that lead to scientific careers. Moreover this data will provide insight on program development that specifically targets the challenges faced by URMs in Science.

Expression of TC0412 Alternate Open Reading Frames Using a Double Tag System

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Zhong Guangming, MD, PhD

This study will provide a more accurate understanding of gene expression after a variety of frameshift mutations have spontaneously appeared in gene TC0412 of *Chlamydia muridarum* to form twelve unique proteoforms in vitro.

Chlamydia maridarum is studied in the laboratory as a model for the human pathogen *Chlamydia trachomatis*. *C. maridarum* has previously shown two distinct virulence periods in infected mice— infections lasting 49 to 77 days, and a separate strain clearing within 10 to 23 days. Sequencing of the two separate populations, showed a single significance factor. The less virulent strain contained a frame shift mutation within the gene TC0412 which is a homolog of gene CT135 in *C. trachomatis*. The data indicates that gene TC0412 is a virulence factor that may contribute to the length of an infection. In vitro, *C. maridarum* consistently undergoes a frame shift mutation in gene TC0412, but not always the same mutation. Twelve different proteoforms of this gene have been isolated with mutation occurring at different sequences within the open reading frame. The exact effects on gene expression of each unique frame shift mutation are not yet known. The results of our experiment will show the expression profiles of this genetic sequence, and the disruption caused by the mutation in *C. maridarum* cells.

Overlapping primers with two separate protein tags have been designed to be annealed onto each segment of the template strands using polymerase chain reaction. The primers are added in a two-step process, primary and secondary, to each end of the proteoform templates. After attaching the primary primers, each proteoform was ran in an agarose-gel using electrophoresis to check the integrity of the primer attachment. Secondary primers were annealed onto the proteoforms and ran through an agarose-gel using electrophoresis.

Currently, transformations are in progress. Each double tagged proteoform will be inserted into a prepared vector plasmid, which contains half *E. coli* and half *C. manidarum* DNA. The newly constructed plasmid, will be transferred into *E. coli* strains to be amplified. Expression profiles of the *E. coli* will be created for each proteoform. After ensuring the gene expression of TC0412 with protein tags in *E. coli*, the plasmid will be placed in *C. muridarum* through transformation. Expression profiles of the *C. maridarum* will be created for each proteoform to determine the gene expression.

The experiment is currently inconclusive due to insufficient data. Preliminary steps have been completed, and have proven that two terminal primers can be bound to template DNA strands of each proteoform as evidenced by electrophoresis on agarose gel. Future data will provide evidence for the effects of unique frame shift mutations on the gene expression of TC0412, and confirm its relevance as a virulence factor.

Quick Start College Algebra and its Effect Upon Student Achievement in College Mathematics

Paul F. Messina, PhD and Amanda Rakowitz, MA

The purpose of the study is to compare two competing curriculum theories in education and shed some light on which of these would be a more productive time investment for teachers, researchers, and most importantly students. The study supports and expands the results of recently published articles, which focus on the relationship between mathematics achievement and various teaching strategies at the tertiary level of instruction. Our hypotheses for this study were:

There is no tendency for the final grade of the students completing a single course in MATH 1304L - College Algebra using the quick start lecture approach to be significantly different than those students who complete a two course sequence in MATH 0319 – Introduction to Algebra and MATH 1304 - College Algebra using the traditional lecture approach.

The final grades of the students completing a single course in MATH 1304L - College Algebra using the quick start lecture approach are significantly different than those students who complete a two course sequence in MATH 0319 – Introduction to Algebra and MATH 1304 - College Algebra using the traditional lecture approach.

Until now, students who were not college ready were required to take a remediation course in mathematics to enrich the skills that the student already had as well as to prepare them for entry into a college-level core mathematics course. The results of this study provide a more cost-effective method for teachers to educate their students while attaining the same end-state specifically, students earning college credit in mathematics in a single semester.

We consolidated several metrics from a traditional MATH 0319 – Introduction to Algebra, MATH 1304 – College Algebra, and MATH 1304L – Quick Start College Algebra course conducted over a one year time frame. The course materials were identical including the final examinations. The only difference of note was the learning style used (traditional lecture versus quick start learning) and the days and times that the classes were scheduled. Multiple class sections taught by the same teacher were utilized in order to keep the possible confounding variables to a minimum. The study utilized a random selection design and the Mann – Whitney U Test.

The analysis shows that the final course grade earned by those students who completed MATH 1304L – College Algebra using the quick start learning approach at our university are statistically equivalent ($p = 0.9258$ and $p = 0.6642$) to the final course average earned by those students completing the two course sequence MATH 0319 – Introduction to Algebra and MATH 1304 – College Algebra using the traditional lecture approach. With this in mind, we can conclude that our students are able to succeed in their attempt to earn credit for a college mathematics course in a single semester. Successful completion of the MATH 1304L – College Algebra utilizing the quick start lecture approach has an equalizing effect on those bubble students otherwise not prepared for direct entry into MATH 1304 – College Algebra using a traditional lecture approach. Future research will expand these results to larger class sizes as well as to other potential mathematics course offerings in an effort to generalize these results across the mathematics curriculum at our university and at other similar institutions of higher learning.

Autonomous Vehicle Summer Camp at UIW for High School Students

Sreerenjini Nair, PhD and Michael T. Frye, PhD

We present the details of new summer camps on Autonomous Vehicles for High School students at the University of the Incarnate Word (UIW). Hosted by the Autonomous Vehicle Systems (AVS) Research and Education Laboratory in the Department of Engineering, the Autonomous Vehicle Camp is part of the UIW STEM Summer Camp. The AVS Lab is funded by the Air Force Office of Scientific Research and is currently investigating autonomous decision making for the formation control of autonomous and semi-autonomous ground and air vehicles in uncertain and ill-defined environments.

Additionally, the AVS Lab has an educational mission to provide research opportunities to UIW students in the area of Unmanned Aerial Vehicles (UAV). Through the mission, our laboratory aims to introduce new teaching methods into STEM courses and to provide student opportunities for theoretical and applied research under faculty supervision.

This previous summer, six High Schools students have participated in a daylong event on autonomous robots using the Lego Mindstorm EV3 and Draganfly UAV quadcopter trainers which was part of a larger UIW MSE STEM Summer Camp. Another Summer Camp, namely Upwardbound Summer Science Academy 2014, providing learning and research opportunities for High School students was also coordinated during the same time. It involved almost 24 students participating in the Lego Mindstorm NXT robots mini projects and offered three different sections on to emphasize the basic programming and the multi-functionality of robots. Additionally, one high school senior student spent a week with the AVS Lab researching decentralized internet control for two autonomous robots.

The students' feedback and our findings show that the trainings and mini research projects were very effective and motivating to the students who want to plan their academic career in applied Engineering. We plan to extend the duration of the camps and similar trainings based on the experiences we gathered from last summer and also to include or provide a separate camp for High School Teachers as well.

The Cardiovascular Effects Produced by Intracerebroventricular Microinjection of N/OFQ in Angiotensin II/High Salt Diet Rats

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The present study utilized angiotensin II high salt diet (ANGII) hypertension model to determine the central-mediated cardiovascular effects of N/OFQ in anesthetized rats.

Intracerebroventricular (ICV) administration of the opioid like peptide, nociceptin/Orphanin (N/OFQ), produces a free water diuresis (increase in the excretion of water without concurrent increase in sodium excretion) in addition to marked effects on cardiovascular function and renal sympathetic nerve activity (RSNA). However, the role of the N/OFQ systems in an ANG II hypertension model is unknown. The knowledge generated will be essential for the development of novel therapeutic strategies for the treatment of hypertension.

Rats were chronically instrumented with cannulas in the femoral artery, femoral vein and urinary bladder, and implanted with a renal nerve electrode. Cardiovascular and renal parameters were measured during control (C, two 10-minutes) and for 60 minutes after ICV injection of saline vehicle or N/OFQ (10 µg/5 µl) in normotensive or ANGI rats. Changes in cardiovascular and renal function were quantified and data were analyzed by one-way analysis of variance with Student Newman-Keuls *t*-test for post-hoc analysis of significance, which was set at $P < 0.05$. All values are presented as mean \pm SEM.

ICV N/OFQ produced a marked decrease in heart rate (HR), mean arterial pressure (MAP) and RSNA in both normotensive and ANGI rats. However, N/OFQ produced greater percent decreases in HR, MAP and RSNA in ANGI rats than normotensive rats. N/OFQ also produced a significant increase in urine flow rate (V) in both groups, but ANGI blunted this diuresis. ICV saline did not produce any significant changes in any of the measured parameters. These findings suggest that in urethane-alpha-chloralose anesthetized rats, N/OFQ appears to have greater effect on the cardiovascular system than in the renal. As such, drugs targeting the central N/OFQ receptors could facilitate the lowering of blood pressure in diseases such as salt-sensitive hypertension.

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The development of a QPCR Assay to Evaluate Putative Regenerative Genes in *Lumbriculus variegatus*

Pompeyo R. Quesada, Biology Student, Robert A. Miranda, PhD, Javier Arjona-Soberon, and
Veronica G. Martinez-Acosta, PhD

To further understand the wound healing and regenerative mechanisms of the black worm, *Lumbriculus variegatus*, we are developing a real-time quantitative polymerase chain reaction assay (QPCR) to evaluate expression of genes encoding regenerative proteins. Previous work in our lab demonstrates an up regulation of the β -catenin protein at key regenerative time points in Lumbriculid central nervous tissue. The armadillo protein β -catenin plays an integral role in cadherin-mediated cell adhesion at the plasma membrane and as a transcriptional regulator in the canonical Wnt signaling pathway. We hypothesize that there will be an up regulation of the gene encoding β -catenin and as well as other genes known to play a role in early development, including Forkhead D (FoxD) and Zinc finger A (ZicA), during key time points of regeneration.

Regenerative capacity is limited in higher order phyla such as humans; however, the aquatic oligochaete *Lumbriculus variegatus* retains novel regenerative capacities along with an organized nervous system that is an ideal model system to study regeneration. Therefore, to further understand the regenerative mechanisms utilized by *Lumbriculus* we are investigating putative regenerative proteins that could help us translate our findings to higher order phyla.

In order to further investigate the role of β -catenin and other genes during Lumbriculid regeneration, we are developing a QPCR assay to evaluate changes in transcript levels within worm tissue. Using bioinformatics databases, we collected mRNA sequences of closely related organisms and found conserved regions within reference genes and genes encoding putative regenerative proteins. We then developed a consensus sequence that allowed us to design degenerative PCR primers. The amplified gene products have been cloned in order to sequence the gene in *Lumbriculus*. We will use these gene sequences to develop specific QPCR primers to evaluate the expression of the reference and putative regenerative genes in Lumbriculid regenerative tissue.

Gel electrophoresis results indicate that we have PCR products of the expected size for reference genes including alpha tubulin, β -actin, and ribosomal protein L8 as well as the putative regenerative gene β -catenin. We are currently developing degenerate primers for genes encoding proteins (zicA, FoxD, and Wnt proteins) that are known to regulate regeneration in other model systems. The identification of gene sequences and our future QPCR data will allow us to implement other molecular approaches, such as *in situ hybridization*, to further evaluate regenerative mechanisms utilized by *Lumbriculus*.

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Expression of Circadian Genes in Rat Peripheral Tissues of a Model of Type 2 Diabetes Mellitus

Willie Rodriguez, Biology Student, Carlos A. Garcia, PhD, and Jessica M. Ibarra, PhD

The purpose of this study was to determine whether molecular disturbances in the heart, lung and liver affect circadian patterns in T2D rats.

Circadian rhythms (expression patterns that repeat every 24 hours) regulate many physiological processes, however we must consider the how expression of clock genes affect metabolic processes such as insulin-glucose secretions. Studies suggest that irregular patterns of sleep, a process under circadian rhythms, are linked with the onset of type 2 diabetes (T2D). While the central pacemaker dictates circadian rhythmic secretions, studies show that peripheral tissues also have a pacemaker involved in rhythmic secretions. Tissue-specific regulators operate different from the master clock and perhaps this difference is important in T2D.

The goal of this study was to examine peripheral mRNA expression of clock genes in liver, heart, and lung tissues of a rat model of T2D. We hypothesized that the mRNA expression of clock genes in rat peripheral tissues was altered.

Heart, liver, and lung tissues from diabetic Zucker fatty rats (ZDF) and control animals were obtained and the tissues were homogenized. Complimentary DNA was synthesized by reverse transcriptase PCR and the expression of four major clock genes in heart, liver, and lungs was examined (Bmal1, Clock, Period 1, and Cryptochrome 1). Subsequently gel electrophoresis was performed, and the resulting clock gene mRNA from diabetic tissues compared to control was analyzed.

Bmal 1 and Clock expressed decreased in diabetic liver, while there was no change in the expression of Cryptochrome 1 or Period 1 genes. Bmal1 expression decreased and Clock expression increased in lung and heart with no change in expression from Cryptochrome 1 or Period 1 genes. These results suggest alternations in clock gene expression in the peripheral tissues in the diabetic tissues compared to control tissues.

In conclusion, our study is the beginning of a search for insights into the molecular mechanisms regulating diabetic peripheral tissues. It is quite likely that peripheral tissues regulate different rhythms from that of the master clock in the hypothalamus, and these differences in circadian rhythm may contribute to diabetes in our model. Looking forward, better insight in the tissue specific effects of clock gene disturbances is of the utmost importance. This can only be accomplished by integrative physiological studies in both the entirety of man and animal, this will be able to provide a complete understanding of the desynchronizing effects the loss of regulation glucose and energy metabolism as it relates to type 2 diabetes.

A Preliminary Examination of the Genetic Diversity within the Chicken Turtle (*Deirochelys reticularia*)

David E. Starkey, PhD and Julie L. Day, MS, US Fish and Wildlife Service

Chicken turtles (*Deirochelys reticularia*) range throughout the US and extend from Florida to eastern Texas. Current research suggests that there are 3 morphologically defined subspecies within the genus. The present study was undertaken in order to determine whether, or not, genetic data (mitochondrial and nuclear DNA) support the morphologically based subspecies designations within the genus.

Currently, genetic data (mitochondrial and nuclear DNA) is routinely utilized to determine species boundaries. The basis of these analyses lies in the fact that closely related species share a common ancestor and should exhibit similarities in the DNA sequences of their genes. If species are not closely related they are not expected to show high levels of similarity in their DNA sequences. To date, no study has undertaken an examination of the genetic diversity within Chicken turtles. This examination is of particular importance given the patchy, but widespread, distribution of these animals. The results of this study will be used to provide a plan to manage the diversity within this species in order to protect and preserve it.

We sampled DNA from 40 individuals throughout the range of the Chicken turtle. From each sample, we obtained a blood sample from which we isolated DNA. Once isolated, DNA was subjected to PCR analysis using 1 mitochondrial and 1 nuclear primer set. The resulting PCR samples were sequenced and these sequences were compared using standard methods in order to determine the relationships between each individual used in the study.

The findings of this study suggest that current morphologically based designation of 3 subspecies with *Deirochelys* does not accurately reflect the genetic diversity within this species. Our preliminary results suggest that there is a significant genetic divide, at the Mississippi River, separating Chicken turtles into an Eastern and Western group. Overall, the levels of diversity recovered in this study are similar to many other studies that have used levels of DNA diversity to describe novel species suggesting that *Deirochelys* should be recognized as 2 distinct species.

Modeling the Dynamics of Competition and Antibiotic Resistance in Gonorrhea

Anthony M. Thomas, Mathematics Student and Suleyman Tek, PhD

Changes in the genetic material of *Neisseria gonorrhoeae* (gonococcus) can occur by conjugation, transformation, and by chromosomal mutations, which are all antibiotic resistance mechanisms. The purpose of this study is to better understand the dynamics of antibiotic resistance in gonorrhea. We develop a mathematical model to attempt to mimic the coevolution of drug-sensitive and drug-resistant bacteria.

Gonorrhea is a sexually transmitted disease that is caused by gonococcus. If gonorrhea is not treated, it could cause pelvic inflammatory disease in women and epididymitis in men, which makes it one of the major causes of infertility. Due to these complications, it is important to be able to maintain treatment. The main way to treat gonorrhea is through the use of antibiotics. Decreasing the spread of gonorrhea has proven to be a difficult task because gonococcus has developed resistance to the six main antibiotics used to fight it. What is even scarier is the fact that some gonococcus strains have acquired multiple-antibiotic resistance. A mathematical model that qualitatively reproduces the dynamics of antibiotic resistance of gonorrhea can be beneficial in determining key factors in the development of antibiotic resistance.

Our modeling framework is based on the assumption that the bacteria can be categorized as one of three strains: drug-sensitive, resistant with low-fitness, or resistant with high-fitness, and is as follows. A host receives a load of drug-sensitive gonococcus. The bacteria reproduce in a suitable area of the host's reproductive tract. Chromosomal mutations occur, and in a short amount of time, there are colonies of drug-sensitive bacteria and drug-resistant bacteria in the infection site. With this framework, we present a mathematical model that consists of three ordinary differential equations. First, we analyze a simple version of the original model by making the assumption that the bacteria lack efflux pumps and that they grow exponentially with no inter-bacterial competition. The dynamics of the simplified model are studied analytically by non-dimensionalizing the original model, analyzing the equilibria, and performing a local stability analysis. After, we analyze the original model to provide a better understanding of the factors that determine how antibiotic resistance emerges within an infected host.

As expected, our numerical simulations suggest that the treatment parameter severely affects the drug-sensitive population, while it gives a significant advantage to high-fitness resistant strains. In the presence of treatment the high-fitness resistant strain dominates in the strain competition. For low values of the treatment parameter, the drug-sensitive strain is the dominant strain. As the treatment parameter increases, the high-fitness resistant strain begins to increase its prevalence until it completely colonizes the host. As the drug-susceptibility parameter increases, the high-fitness resistant strain loses its fitness advantage and is outcompeted by the drug-sensitive strain. As the carrying capacity increases within the host, the high-fitness resistant strain increases linearly, while the drug-sensitive and low-fitness drug-resistant strain populations are cleared from the host.

Synthesis and characterization of ground and excited state properties of [Ru(tpy)(bpy)(MeO-py)]²⁺

An T. Vu, Chemistry Student and Robert N. Garner, PhD

[Ru(tpy)(bpy)(MeO-py)]²⁺ (**1**), where tpy = 2,2',6',2''-terpyridine and bpy = 2,2'-bipyridine, was synthesized and its photophysical and photochemical properties were investigated and compared to [Ru(tpy)(bpy)(py)]²⁺ (**2**), where py = pyridine.

Ruthenium(II) polypyridyl complexes have received a great deal of interest due to their relatively long-lived excited state lifetimes and their stability in air and water. These properties make them ideal candidates for use in dyes-sensitized solar cells, as catalysts for photoactive reactions, and as photodynamic therapy (PDT) agents. Although much progress has been made in these areas, new compounds are sought to improve competitiveness and efficiency of existing technology. Electronic absorbance, emission, and oxidation and reduction potentials are the determining factor of the ability of a complex to be applied in these areas. The ground-state, excited state, and redox properties of these types of metal complexes are able to be tuned by changing the coordination sphere around the central metal atom in the complex. To this end, new complexes with varying ligands were investigated.

The ruthenium complex was synthesized by following previously published literature methods for similar complexes. The structure of the product was characterized using proton nuclear magnetic resonance. Electronic absorption and emission spectra were obtained to characterize the ground state and excited state properties of the complex.

The electronic absorption spectra shows a red shift of the singlet metal-to-ligand charge transfer (¹MLCT) and emission spectra also shows a red shift in the triplet state emission of **1** when compared to **2**. This data indicates that the electron donating methoxy group in the para position of the pyridine ligand has a slight destabilizing effect on the Ru(d_{xy}) type orbitals. The synthesis and characterization of the new complex [Ru(tpy)(bpy)(MeO-py)]²⁺ further demonstrates the tunability of ruthenium (II) complexes and helps expand the existing knowledge of the field of inorganic chemistry.

Faculty Opinions to Changes in Accepting Creative Scholarship for Tenure and Promotion in Textiles and Apparel Design

Melinda K. Adams, PhD and Sonya S. Meyer, PhD

The purpose of this research was to survey faculty in the apparel and textile design discipline in the United States regarding the change in the acceptance of creative scholarship for tenure and promotion decisions at institutions of higher education.

Previous research reviewed tenure and promotion documents from the institutions that were included in the original study (Adams & Meyer, 2014). Tenure and promotion documents were reviewed to determine whether or not documents had changed. If the documents had changed, administrators were asked why changes had occurred. With no answers from the administrators, researchers were left to wonder why. The interest was in whether or not there had been a cultural shift at these institutions or had faculty forced the changes to happen. Current research asked faculty in textile and apparel design programs if changes had occurred in acceptance of creative scholarship at their institutions.

For the current research, the Criteria for Creative Scholarship survey was modified to gain information on opinions to changes in acceptance of creative scholarship during the last decade (Adams & Meyer, 2009). The survey contained closed-ended and open-ended questions. Closed-ended questions gathered demographics as well as questions as to whether the institution defined creative scholarship, changes to the tenure and promotion process, and if further changes were needed. Open-ended questions contained more belief questions and gathering specific information on creative scholarship and changes that may or may not have occurred. These questions were designed to get at possible cultural shifts at institutions of higher education in the United States. Potential participants were selected from the directory of the International Textiles and Apparel Association that offered a bachelor's degree with majors or areas of concentration including textile and/or apparel design. An email invitation via survey monkey was sent to 100 members. Twenty-five responses were received. Basic averages were used to analyze the closed ended questions. Theme analysis was used to determine common topics or ideas expressed by participants in the open-ended questions.

The acceptance of creative scholarship for tenure and promotion improved at some institutions over the last ten years and embraced the call to broaden the definition of scholarship. Many of the respondents touted the changes made by their institutions, while others have been left to struggle and continue the battle to gain acceptance of this form of scholarship. However, no matter what changes have been made so far, it seems that much more work is needed to move forward on acceptance of creative scholarship.

Examining the Acceptance of Wearable and Smart Phone Technologies by Millennials in Current Social Media Sites

Melinda K. Adams, PhD and Sharon S. Pate, PhD

The purpose of this study was to examine the social media influence of potential adoption of wearable technology among Millennials to determine whether use of social media by Millennials will increase openness to wearable technology.

Companies wanting to explore wearable technology are focusing on Millennials since they include more than 80 million Americans in the 18-49 market and are the highest consumers of social media and technology (Van Paris, A, 2014). Thus to be able to make wearable technology into the next social phenomenon the advertisers should analyze customer needs and generate more interaction between customers, their contact list, and the researchers creating the products (Holsapple, Hsiao, & Pakath, 2014).

A survey monkey link was distributed to college students using blackboard and asking for their participation. The study collected demographic and quantitative data through closed-ended questions about social media use, on-line buying behaviors, and use or knowledge of wearable technology. Data analysis performed included averages, t-tests, and correlations. Averages were used to give basic demographic data and information on what and how much social media millennials are using as well as wearable technology. T-tests and correlations were used to look at relationships between social media use, wearable technology interest and/or use, and age.

Researchers found that Millennials in this study between have strong ties to social media sites. These strong ties to social media do not appear to have a statistically significant influence on their interest in wearable technology. This lack of enthusiasm for wearable technology is supported by the literature (Koo, 2014).

Researchers did not find significant relationships between social media sites and interest in or having tried wearable technology or age and interest in or having tried wearable technology. This lack of relationships may be due to the small number of participants who participated in this survey and/or lack of availability until recently for the average person to try wearable technology.

Once more wearable technology, such as the apple watch, is available to the general public a follow up study would provide more insight as to interest in wearable technology by Millennials and how it is used to interact with social media.

Designing Across Borders

Teresa Lopez, MA, MS

With the collaboration of the U.S. Mexico Foundation, University of Incarnate Word students created proposals for branding a company to distribute new apparel designs that incorporate unique weaving techniques of textile products of artisans in Chiapas, Mexico.

The teaching strategy was twofold:

1. Create a brand concept for a company that could distribute traditional clothing and goods from Chiapas, Mexico,
2. Re-design clothing into more youthful attire to attract a younger target market.

The collaborative efforts of two classes, Promotional Strategies and Textile Product Analysis, provided a collection of garment sketches and prototypes constructed by students. Several pieces of clothing from regions in Mexico were "re-purposed" and patterns were created to reproduce duplicates of garments in a size array for future manufacturing opportunities.

To brand the new company, students proposed an operational concept that included a brick and mortar location, an online website, and a portable "clothing van", similar to a food truck. Marketing through social media avenues were emphasized for attracting the millennial generation client and customer service standards were outlined.

Today, the next phase of implementation is underway with the creation of garment specifications in the Textile Production Analysis class taught in the Fashion Management Department of the School of Media & Design. Six teams developed detailed specifications for costing, fabrication, measurements, color schemes, and stitch & seam requirements. A collection of twelve garments were illustrated and submitted to the U.S. Mexico Foundation for future manufacturing opportunities.

The collection included three day dresses, two ensembles with slacks and a loose peasant styled blouse, six two-piece skirts with tops, and one evening dress. Fabrications ranged from lightweight cotton batiste to linen, and cotton broadcloth, inlayed with various textiles from Chiapas. Intricate embroidered textiles were imbedded into the yokes, bodices, waistbands, necklines, sleeves, and outer seams of slacks. The rebozo was integrated into a cape, an asymmetrical skirt, and a draped bodice.

Preliminary costing of each ensemble was completed to include fabrication, findings, garment labels, color ways, fabric testing, measurements, and sew sequence. Students were challenged with the entire life-cycle of creating a garment from conception to completion prior to manufacturing the garment. They gained an appreciation of the complexity of the process and the number of steps involved in the developmental stages of garment design.

From a social justice aspect, this project allowed students to grow in appreciation of the cultural diversity within our community and to honor and respect the traditional talent and richness of the Mexican artisans. Furthermore, this teaching strategy will lead to additional learning and fashion design opportunities across countries.

Design for Social Change Project 2012: Diplomás, a Subsidiary Non-Profit Organization of SA2020

Doris Palmeros-McManus, MFA

This design team project was developed to give students an experience in service learning through a collaborative effort. Our class worked with the Diplomás organization to produce an essential need in their visual identity. Their mission is to increase post-secondary education and to improve earning potential for Hispanics in San Antonio.

Diplomás is a small collaborative of the bigger SA2020 initiative in San Antonio Texas. SA2020 is a movement started in 2010 to nurture civic participation and achieve a collective vision with specific goals by the year 2020. These goals involve “causes” in arts, culture, civic engagement, education, etc. The student’s participation and submissions helped build on this city-wide advocacy. As design students, they were able to empower themselves and use their talents and voice for a greater cause.

In turn, Diplomás’ initiative was on the importance of post-secondary education and thus these college students felt appropriately part of the target audience. This helped bring their own personal insights into the project even further. The goal of Diplomás is to increase post-secondary credentials and improve earnings for Hispanics in San Antonio – people with a college degree make approximately 84% more than those without. The project was developed as a cooperative learning experience, which involved active group participation and service learning. Students were challenged to use their learned skills from the graphic design program and problem-solve a visual communication need for the organization, Diplomás.

As a graphic design project, the goal for the students was to create a successful logo and tagline to communicate the message of “education” & the potential for “more”/ “mas”. We also created extended collateral to help promote the idea that a better future was within reach through education and skill development. Creative phases included initial meetings with client to understand and research objective and strategy. Design implementation was expanded to logo and printed collateral. Plus, a PowerPoint presentation was given to the client committee.

The project was developed as a cooperative learning experience, which helped build independence, leadership, group and individual accountability, decision-making and group social skills. The class was composed of 15 students and 3 teams were broken down to 5 students each. Challenges within the groups varied on delegating the creative workload, group communication, organizational and project management. Some other challenges included adhering to a tight phase development schedule, meeting with client, and finally presenting to client. Each group developed their own creative strategy, and then presented. All students completed peer evaluations for assessment.

The collaboration provided an introduction to Social Design through service learning. Using their talents and their learned skills in graphic communication, students were able to provide a necessary element for the Diplomás project. Furthermore, the component of active learning was essential in problem solving the client’s need.

The students were ultimately honored by the mayor of San Antonio, Julian Castro, and by the higher education community, in a public unveiling of the new identity design for the Diplomás program.

Clothing of the Christ

Carla Anderson Perez, PhD

This study investigates the clothing worn by Christ at the beginning and end of His thirty-three years on Earth. The function of the clothing is explored as well as the methods most likely used to make these items. Similarities to present-day textile/apparel methodologies are presented.

This was a two-part investigation. Bible verses referencing the birth (Part 1) and death (Part 2) of Jesus Christ were used to establish the clothing he wore at those times. The descriptions of the clothing were then examined in relationship to textile/apparel practices of the time. Church artifacts and religious artwork relating to the clothing were also studied. Finally, modern-day textile/apparel manufacturing was compared to the solutions implied by church relics and religious art throughout the 2000 years since the events of Christ's birth and death.

The clothing worn by Jesus at the start and end of His earthly life has connections to present-day textiles and apparel. Swaddling is still used to comfort newborns. Garments made without seams are being developed by modern manufacturers. Further comparisons can be made between the *functional purposes* of the two garments and their *spiritual inferences*. Swaddling can be compared to the security found only in The Heavenly Father; the seamless robe, God's endless love and the unity of believers in Christ.

Improvements in Cultural Knowledge and Skills in Doctor of Physical Therapy Students through Classroom Activities

Jason M. Denton, PT, DPT, MS, Shandra Esparza, EdD, ATC, LAT, and David S. Fike, PhD

Physical therapist educational programs include cultural competency training to prepare students for practice in a diverse society and meet accreditation requirements. The Cultural Competency construct includes five sub-constructs: Awareness, Knowledge, Skills, Encounters, and Desire.

Are classroom activities effective for improving cultural competency in Doctor of Physical Therapy students? We hypothesize that after participating in the cultural competency module students will demonstrate improvement in Awareness, Knowledge, and Skills but will not demonstrate improvements in Encounters or Desire.

The Commission for Accreditation in Physical Therapy Education (CAPTE) delineates 26 curriculum criteria related to culturally competent care. Physical therapist education programs are required to document outcomes of curriculum objectives. Multiple published works describe attempts by physical therapist education programs to provide educational cultural competency components, but very limited objective data supports the effectiveness of educational strategies. As described in the APTA Blueprint for Teaching Cultural Competence classroom activities are designed to facilitate improvements in the domains of Cultural Knowledge, Skills, and Attitude. Evidence to support educational activities is important for accreditation purposes and to guide the selection of educational methods. Our study is intended to determine whether classroom activities are effective for promoting cultural competency.

52 students in the Professional Topics DPT 5514 course completed an Inventory for Assessing the Process of Cultural Competence Among Healthcare Professionals- Student Version (IAPCC-SV) pre-test to establish a baseline level of cultural competency. Additionally, students reported demographic information including age, gender, race, religion, and characteristics of their city of origin. The students participated in the following educational activities as part of the DPT course cultural competency module: 1) readings and facilitated discussions, 2) case-based independent learning objectives, 3) performance of specific skills, and 4) reflection activities.

After the educational intervention all 52 students completed a post-test IAPCC-SV. Differences in pre- and post-test measures were calculated and compared to the reported minimal detectable change (MDC) for the entire tool and for each individual construct.

Students exhibited the following increases in cultural competency from pre-test to post-test: Awareness: 0.48; Knowledge: 2.46**; Skill: 2.19**; Encounters: 0.81; Desire: 0.35; Total Cultural Competency: 6.29** (**exceeds MDC95). Caucasian students demonstrated a lower ($p = .027$) total Cultural Competency at baseline (58.96) compared to minority students (62.13).

The DPT students demonstrated improvement in total Cultural Competency, including the specific learning domains of Knowledge and Skills. Significant changes in the Awareness, Encounters, and Desire domains were not achieved. Future studies should focus on 1) The development and testing of activities designed to promote improved Cultural Awareness and 2) The role race may play in initial Cultural Competency.

Improvements in Cultural Competency including Awareness, Desire, and Encounters in DPT Students through Addition of a Local Cross-Cultural Service-Learning Experience

Jason M. Denton, PT, DPT, MS and Jaime Gonzalez, PT, DPT, OCS, SCS

Doctor of Physical Therapy (DPT) educational programs invest significant time and resources into promoting cultural competency in their students. To date very limited evidence supports the effectiveness of local community engagement projects at improving Cultural Competency. Our research sought to address the question: will local cross-cultural service-learning activities result in improved Cultural Competency in DPT students? We hypothesized that DPT students will demonstrate increased Cultural Competency, including Cultural Awareness, Desire, and Encounters through a series of local cross-cultural service-learning experiences.

The vast majority of research evidence demonstrating improved Cultural Competency involves overseas immersion trips. These trips require significant time and financial investments. If we can develop effective local cross-cultural activities, then programs can choose these more practical methods. Additionally, recent results indicate that classroom activities are effective for promoting improved Cultural Knowledge and Skills but do not result in significant improvements in Cultural Awareness, Encounters, or Desire. Awareness, Encounters, and Desire are key to increasing the likelihood of long-term improvements in Cultural Competency. It is proposed that relational, cross-cultural interactions may be required to facilitate improvements in Awareness, Encounters, and Desire.

52 UIW DPT students completed an *Inventory for Assessing the Process of Cultural Competence among Healthcare Professionals- Student Version* (IAPCC-SV) pre-test to establish baseline Cultural Competency; completed a “Post-test 1” after classroom experiences but prior to participation in the cross-cultural experience.

In partnership with Catholic Charities, Archdiocese of San Antonio Refugee Services program, participated in a local cross-cultural service-learning opportunity. Students spent 3-4 total hours with refugee clients over two contacts, in which students served as volunteer instructors in English classes and completed Wellness Assessments and Recommendations. Students worked with interpreters to explore the clients’ cultural backgrounds, health beliefs, and current health and wellness status and to make recommendations to clients of how to integrate healthy behaviors into their new social environments.

After completing the described experiences and a guided reflection paper, students took a final IAPCC-SV “Post-test 2.” Results were calculated and differences in test scores were compared to the IAPCC-SV minimal detectable change (MDC) data.

The cross-cultural experience resulted in additional improvement in total Cultural Competency. While the cross-cultural activity alone did not result in significant changes in Awareness, Encounters, or Desire, the addition of the local cross-cultural experience to the initial classroom learning resulted in a cumulative change significant for all 3 categories. The results of this brief local cross-cultural interaction are promising for programs seeking more economical methods of promoting Cultural Competency and specifically Awareness, Desire, and Encounters. Additional contacts and/or contact hours may be required to exceed significance for total Cultural Competency and targeted categories.

Improvements in Cultural Awareness, Knowledge, and Skills in Athletic Training and Rehabilitation Science Students through Lecture-Based Classroom Activities

Shandra Esparza, EdD, ATC, LAT, Jason M. Denton, PT, DPT, MS, and David S. Fike, PhD

Athletic training and rehabilitation science programs frequently include cultural competency training in their educational programs. Cultural competency includes five constructs: Awareness, Knowledge, Skills, Encounters, and Desire.

Are classroom activities effective for improving cultural competency in athletic training and rehabilitation science students? We hypothesize that after participating in the cultural competency module students will demonstrate improvements in Awareness, Knowledge, and Skills but will not demonstrate improvements in Encounters or Desire.

The *Commission on Accreditation of Athletic Training Education Competencies* document lists cultural competence as a “Foundational Behavior of Clinical Practice.” Athletic training programs include readings and classroom activities, and in some cases experiential activities, intended to improve cultural competency to prepare students for practice in a diverse society. Evidence to support educational activities is important for accreditation purposes and to guide the selection of educational methods. No data measuring whether classroom activities are effective for promoting cultural competency currently exists. Our study is intended to determine whether classroom activities are effective for promoting cultural competency.

27 students in the Introduction to Patient Care (ATHP 1310) course completed an Inventory for Assessing the Process of Cultural Competence Among Healthcare Professionals- Student Version (IAPCC-SV) pre-test to establish a baseline level of cultural competency. Additionally, students reported demographic information including age, gender, race, religion, and characteristics of their city of origin. The students participated in the following educational activities as part of the ATHP 1310 course cultural competency module: 1) Cartwright text readings, 2) lecture presentations on cultural knowledge of various cultures, 3) in-class discussions and activities related to the Campinha-Bacote model, 4) M&M cultural awareness activity. After the educational intervention all 27 students completed a post-test IAPCC-SV. Differences in pre- and post-test measures were calculated in Excel and compared to the reported minimal detectable change (MDC) for the entire tool and for each individual construct.

Students exhibited the following increases in cultural competency from pre-test to post-test: Awareness: 1.33*; Knowledge: 3.22**; Skill: 1.85**; Encounters: .82; Desire: .11; Total Cultural Competency: 7.33**.

*exceeds MDC₉₀ (90 % confidence interval of minimal detectable change)

**exceeds MDC₉₅ (95 % confidence interval of minimal detectable change)

The differences between pre-test and post-test measures for Awareness, Knowledge, Skills, and Encounters were all statistically significant ($p < .001$). Based on established MDC data the educational interventions were effective for improving Total Cultural Competency in the Athletic Training and Rehab Science students, including the specific learning domains of Knowledge and Skills. Changes in the Awareness learning domain were significant at the MDC₉₀ level but not the MDC₉₅ level, while based on MDC data improvements in Encounters and Desire were not observed with classroom activities. Additional experiential activities, reflection, and a longer time period may be necessary to promote greater Cultural Awareness, Encounters, and Desire.

VISUAL ARTS ABSTRACTS

Silk Sonata

Carla Anderson Perez, PhD

The objective of this project was to design a gown fulfilling the unique needs of a female concert pianist.

The pianist discussed the specifics for a recital gown with the researcher. In addition to a dramatic appearance and flawless fit, it must stay secure during long and often physically-demanding concerts. Emphasizing that a pianist needs to have no concerns other than performing, she had found various styles ineffective. Strapless gowns allowed adequate movement but required snug undergarments that left the pianist uneasy. Sleeveless garments provided security but restrained the arms. A solution was found using contoured straps that avoid the shoulder-armhole region yet support the bodice.

External straps pass through each other at center-front neck; continue over the shoulders then cross again appearing to end at slot-buttonhole closures. Underneath they continue wrapping around the torso; fastening at center-front ensuring a reliable fit. Jean Louis, the costumer for *Gilda* (1946), hid a harness-like device under the gown he designed for Rita Hayworth. Although not as elaborate as his, this unseen strap-structure distributes the stress of the outer garment around the body.

The need to move her feet from under the bench to the pedals without ensnaring the skirt was vital; yet a shorter skirt was not an option. Fullness was needed at the hips to prevent wrinkling in the lap and to allow sliding/leaning horizontally along the keyboard. The center-front split skirt allows it to flow over the bench preventing wrinkles and at the same time let performer's feet reach the pedals without catching on her shoes. The skirt was gathered to a 3:1 ratio. The zipper was placed on the left side away from the audience's view.

Capris were added for security and modesty. The region between the waist and the thigh was made of a swim suit knit to accommodate comfort and movement. From the upper thigh downward to the calf the capris are made of the same solid silk as the neckline's band.

Draping and pattern engineering were used in the creation of this gown. The bodice and the skirt were draped on a dress form. The contoured bands/straps were made using flat pattern techniques. Both hand and machine stitching were used to assemble the garment. All pieces are underlined with organza. Hand catch-stitches secure the hem to the underlining so that no stitches come through the outer layer. Machine under-stitching assures that the back of the bands/straps do not show on the outside.

The textiles used include: Silk satin floral, rayon lining, and organza underlining. A 22" invisible zipper and two 1.25" covered buttons (upper half peach, lower half brown) were used for the closures. Satin ribbon loops at the unseen ends of the two straps are secured with a ribbon-covered elastic belt to complete the harness-type "security system" inspired by Jean Louis.

The result is a visually-appealing, performance-ready gown in which the pianist can make a dramatic entrance, play Chopin or Rachmaninoff with total abandon, and take un-wrinkled bows.

