

Fifth Annual

Andrews University

Celebration of Research & Creative Scholarship

November 1, 2013 | Buller Hall

PROGRAM AND ABSTRACT BOOK

“Research and creative scholarship permeate our academic life, inform our teaching and strengthen our emphasis on generous service.”

Niels-Erik Andreasen, President



WELCOME



Welcome to the **Fifth Annual Andrews University Celebration of Research and Creative Scholarship.**

The University is where inquisitive minds seek out new knowledge and better understanding of ourselves and the world we inhabit, and where this knowledge may be applied for the benefit of others. At Andrews University, research and creative scholarship permeates our academic life. Faculty and students work together to ask questions, seek answers, and apply what they learn. The program today highlights just some of the broad spectrum of research and creative scholarship being performed at Andrews.

The **Celebration of Research and Creative Scholarship** is a campus-wide event that transcends disciplinary boundaries to showcase the culture of research and creative scholarship at Andrews. Presentations are given by Andrews University Faculty and Graduate Students. Undergraduate students also are very active in research at Andrews, and their work is presented at the annual **Honors Scholar and Undergraduate Research Symposium**, which will be held this year on March 7, 2014.

The program begins with Plenary Presentations given by the 2013 winners of the **Siegfried H. Horn Excellence in Research and Creative Scholarship Award**. The Award was established in 2011 to honor Siegfried H. Horn's legacy of scholarship and contribution to the field of biblical archaeology at Andrews University and his impact upon the world church and the wider community of scholars. The award recognizes lifetime achievement in research and creative scholarship for faculty members of Andrews University, and is given annually to one individual in each of four areas. This year's plenary presentations are given by Øystein LaBianca, professor of anthropology and associate director of the Institute of Archaeology, and by Fernando Canale, emeritus professor of theology and philosophy. LaBianca will be speaking about "globality" as a point of view, not only for economics and commerce, but also for his research as an anthropological archaeologist. Canale explores the connection between philosophy and Scripture, and how theological research can remain faithful to the *sola/tota/prima Scriptura* principle.

Thank you for joining us for this celebration of research and creative scholarship. To learn more about the breadth of research being done at Andrews, please visit us at www.andrews.edu/research.

Sincerely,

A handwritten signature in cursive script that reads "Gary W. Burdick".

Gary W. Burdick
Associate Dean for Research

SCHEDULE OF EVENTS

12:30-1:30 pm **Plenary Session** (Newbold Auditorium)

See page 5 for program abstracts.

Introduction and Welcome – **Christon Arthur**, Dean, School of Graduate Studies & Research

Introduction of Speakers – **Gary Burdick**, Associate Dean for Research

Presentations by recipients of the **2013 Siegfried H. Horn Excellence in Research and Creative Scholarship Award:**

PL-1 **Øystein LaBianca, Professor of Anthropology**

Globality: Its Implications for Research and Creative Scholarship at Andrews and Beyond

PL-2 **Fernando Canale, Emeritus Professor of Theology and Philosophy**

The Adventist Sola Scriptura Research Project

Closing Prayer – **Keith Mattingly**, Dean, College of Arts & Sciences

1:30 - 3:00 pm **Poster Presentations** (Buller Hallways)

See pages 12-22 for program abstracts.

Refreshments served in the central atrium

P-01–02	Agriculture
P-03	Architecture
P-04	Distance Education
P-05–07	Education
P-08	English
P-09	Social Work
P-10–11	Music
P-12–13	Visual Art and Design
P-14–15	Library
P-16	Business
P-17–20	Biblical Studies and Theology
P-21–29	Biology
P-30–33	Chemistry
P-34–36	Mathematics
P-37	Physics
P-38–39	Engineering and Computer Science
P-40–41	Nursing
P-42–44	Physical Therapy

3:00 - 4:00 pm **Oral Breakout Sessions** (Buller Classrooms)

See pages 6-12 for program abstracts.

Session A	Nurture and Retention Symposium (BH 108)
Session B	Theology and History of Religion (BH 149)
Session C	Biblical Studies (BH 150)
Session D	Literature and the Humanities (BH 208)
Session E	Chemistry and Engineering (BH 227)
Session F	Culture and Society (BH 250)
Session G	Biology and Math (BH 251)

ORAL PRESENTATION SCHEDULE

Session A: Nurture and Retention Symposium BH108

- 3:00 pm A-1 **Alina M. Baltazar, Curtis VanderWaal, Kathryn Conopio**, *Perceptions of Health Behaviors by Seventh-day Adventist Undergraduate Students: Do parents and religion matter?*
- 3:15 pm A-2 **Karl G. D. Bailey**, *Internalization of Distinctive Religious Practices is Associated with Increased Well-Being*
- 3:30 pm A-3 **Duane McBride, Wendy Thompson, David Sedlacek, & Rene Drumm**, *Correlates of Perceived Emotional/Verbal and Spiritual Abuse of Adult Children of Pastors*
- 3:45 pm A-4 **Katelyn Ruiz**, *Welcoming Nonverbal Behavior: A Case Study of Group Communication and Visitor Impressions*

Session B: Theology and History of Religion BH149

- 3:00 pm B-1 **Paul B. Petersen**, *Tritarian Development in the Early Danish Adventist Church*
- 3:15 pm B-2 **Kelvin Onongha**, *Lessons and Legacies of the Role of Scripture in Scottish Missions to Contemporary Missionary Praxis*
- 3:30 pm B-3 **Davide Sciarabba**, *A Lesson of Unity from Catholicism: The Experience of Maurice Blondel and Alfred Loisy during the Challenge of Modernism*
- 3:45 pm B-4 **Adriani Milli Rodrigues**, *The role of Christian Doctrine in contemporary Theological Interpretation of Scripture: a brief analysis*

Session C: Biblical Studies BH150

- 3:00 pm C-1 **A. Rahel Schafer**, *Sentient or Silent? The Personification of Stones and Wood in Habakkuk 2*
- 3:15 pm C-2 **Arlyn S. Drew**, *Justifying the God of the Akedah: Interpretation as Theodicy*
- 3:30 pm C-3 **Ronald Rojas**, *The Deliverance of "I" in Rom 7:24-25*
- 3:45 pm C-4 **Erick Mendieta**, *Representative Headship in Genesis 1-3*

Session D: Literature and the Humanities BH208

- 3:00 pm D-1 **L. Monique Pittman**, *Shakespeare and the Cultural Olympiad: Contesting Gender and the British Nation in the BBC's Hollow Crown*
- 3:15 pm D-2 **Vanessa Corredera**, *Physiognomy, Art, and Artifice in The Rape of Lucrece and The Devil's Law-Case*
- 3:30 pm D-3 **Ante Jeroncic**, *The Moral Realism of Iris Murdoch*
- 3:45 pm D-4 **Sonia Badenas**, *Short Stories in the French Classroom: An additional way to seek knowledge, affirm faith and change the world?*

Session E: Chemistry and Engineering BH227

- 3:00 pm E-1 **Boon Chai Ng**, *Evaluation of the Electrical Resistance and Capacitance of a Di-Electric Electro-Active Polymer*
- 3:15 pm E-2 **Ryan T. Hayes, Tyler Pender, J.C. Lynch, Zach Reichert, Andrew Stewart**, *Isolation and Structure Determination of Carcinogenic Arginine-Based Heterocyclic Amines*
- 3:30 pm E-3 **Desmond Murray**, *The Products of Research*

Session F: Culture and Society BH250

- 3:00 pm F-1 **Marcella Myers**, *European Integration and Corporate Interests: winners and losers*
- 3:15 pm F-2 **Janet Blackwood**, *Choice and Motivation in Indigenous Language Revitalization*
- 3:30 pm F-3 **Joel Raveloharimisy, Erenly Agosto**, *Accidental Path Dependency in the Evolution of Gender Equality in Madagascar*
- 3:45 pm F-4 **Ellen Rodrigues**, *My Cross-Cultural Journey: An Autobiographical Analysis of the Challenges and Negotiations in Entering the World of Unfamiliarity*

Session G: Biology, Mathematics, and Art BH251

- 3:00 pm G-1 **James L. Hayward, Shandelle M. Henson, and Lynelle M. Weldon**, *Hot and Bothered I: Climate Change, Cannibalism, and Ovulation Synchrony*
- 3:15 pm G-2 **Shandelle M. Henson, James L. Hayward**, *Hot and Bothered II: Climate Change, Cannibalism, and Ovulation Synchrony*
- 3:30 pm G-3 **Lynelle M. Weldon, James L. Hayward, and Shandelle M. Henson**, *Hot and Bothered III: Climate Change, Cannibalism, and Ovulation Synchrony*
- 3:45 pm G-4 **Steve Hansen**, *Vessels for the Kool-Aid Ceremony*

PLENARY PRESENTATIONS

PL-1 *Globality: Its Implications for Research and Creative Scholarship at Andrews and Beyond*

Øystein LaBianca, Department of Behavioral Sciences and Institute of Archaeology

“The earth is the Lord’s, and the fullness thereof; the world, and they that dwell therein” (Ps 24:1). It has been said that ‘globality’ is what comes after globalization. Unlike globalization, which to a large extent has been a one-way street of the West imposing its ways on the rest, ‘globality’ is the condition where ideas and commerce flow between all parts of the globe--in other words, a world without one or more dominant centers. It is the “flat earth” foreseen by the journalist Thomas Friedman in his book by the same title. “Globality” is also a new point of view—a new perspective from which to do research and creative scholarship. For example, whereas until recently, world history was essentially European history, the perspective of “globality” now challenges historians to re-imagine how history might be written when the story to be told is that of humanity in all parts of the world. Examples of such global history writing are *Maps of Time* by David Christian and *The Human Web* by J.R. and William H. McNeill. The perspective of “globality” has implications for research and creative scholarship in many other disciplines as well, several examples of which will be briefly mentioned. I will conclude the presentation by explaining how my own research as an anthropological archaeologist working in Jordan at Tall Hisban is being re-purposed and re-designed with the concept of “globality” as a point of departure.

PL-2 *The Adventist Sola Scriptura Research Project*

Fernando Canale, Department of Theology and Christian Philosophy

My research has demonstrated the possibility, foundations, goal and method for a broad reaching, interdisciplinary research project grounded on the faithful application of the Seventh-Day Adventist sola-tota-prima Scriptura principle. The current presentation will explain how my work stems from the as yet unexplored connection between Scripture and philosophy. From this angle, and using current philosophical discoveries and the role of paradigms in scientific research, my studies suggest that during the last century science has moved from a classical-timeless to a hermeneutical-temporal scientific paradigm. This seismic shift calls for the deconstruction of classical, modern and postmodern theologies and requires rethinking the entire edifice of Christian theology from scratch, that is to say, from the things themselves rather than from tradition. Here the Adventist total commitment to Scripture provides the ground, data and perspective from which to understand a new theological paradigm from its philosophical foundations to its missiological applications. To investigate all the consequences of this macro paradigm shift for Adventist Theology and the Adventist University it is necessary to create an interdisciplinary team of specialists fully committed to the sola-tota-prima Scriptura principle. This project should work first within the area of the Theological Encyclopedia and then include all the disciplines taught in Adventist universities around the world.

ORAL PRESENTATIONS

A- Nurture and Retention Symposium

A-1 *Perceptions of Health Behaviors by Seventh-day Adventist Undergraduate Students: Do parents and religion matter?*

Alina M. Baltazar¹, Curtis VanderWaal¹, Kathryn Conopio², ¹Department of Social Work, ²MSA student in Community and International Development

This qualitative study investigated college students' perception of drug and alcohol use, and sexual activity, in order to gain a better understanding of the decision making process regarding participation in health risk behaviors. In addition, questions were asked in regards to the influence parents and religion may have on these behaviors. There were 52 undergraduate students of a Seventh-day Adventist university who participated in six focus groups. The results were coded and analyzed, and a theoretical model was developed describing the students' perception of drug and alcohol use, and sexual activity, what influences those perceptions, and how those perceptions may influence decision making. Subcategories of each component of the theoretical model were identified and are illustrated by narrative data. Results will include implications on how healthy behavior choices influence commitment to the church. Implications for health risk behavior research and practice, Seventh-day Adventist university administrators, church youth directors, parents, and clinical practice are addressed.

A-2 *Internalization of Distinctive Religious Practices is Associated with Increased Well-Being*

Karl G. D. Bailey, Department of Behavioral Sciences

The relationship between well-being and religion is complex. For some religious individuals, well being is higher on average than among non-religious individuals; for others, it is much lower. What makes the difference? Internalization of religious beliefs and practices appears to predict the direction of the relationship. The current study replicates the finding that internalization is related to well-being in Seventh-day Adventist young adults and extends it to a distinctive religious practice, Sabbath keeping. Internalization of Sabbath keeping was measured by a new instrument developed using Self-Determination Theory. An exploratory factor analysis of responses from 347 Seventh-day Adventist young adults from the same community supported three internalization factors underlying Sabbath keeping experiences, each of which was moderately associated with higher subjective well-being. Moreover, a more general measure of internalization of religion only weakly mediated the relationship between internalization of Sabbath keeping and well-being, indicating a unique contribution of internalizing distinctive practices.

A-3 *Correlates of Perceived Emotional/Verbal and Spiritual Abuse of Adult Children of Pastors*

Duane McBride¹, Wendy Thompson², David Sedlacek³, & Rene Drumm⁴, ¹Department of Behavioral Sciences, ²Department of Social Work, ³Department of Discipleship & Religious Education, ⁴School of Social Work, Southern Adventist University, Collegedale, TN

Social Scientists as well as pastors have often expressed concern about the consequences of the stress experienced by the children of pastors. We conducted an on-line survey of pastors, spouses, and adult children for the North American Division. A total of 171 adult children of NAD pastors completed the survey. Overall, while less than 5%, reported any form of physical or sexual abuse, about 25% reported some concern about emotional/verbal abuse with 17% expressing at least some concern about spiritual abuse. Data analysis showed moderate to relatively high correlations between perceptions of being emotionally/verbally or spiritually abused and self-reports of concern about substance abuse, mental health, gambling, congregant/community behavioral expectations, domestic violence, and same sex attraction (between .20 & .46). There were also significant correlations with difficulty with personal prayer. These correlations strongly suggest that abuse may occur within a context of family dysfunction and congregant/community pressure that may result in a wide range of chemical and behavioral addictions and a diminished prayer life as well as mental health problems. It is important for the Church to be aware of these issues and to provide support services to reduce the stresses placed on the family of clergy and provide needed preventive and intervention services to improve the spiritual life and retention of pastor's children.

A-4 *Welcoming Nonverbal Behavior: A Case Study of Group Communication and Visitor Impressions*

Katelyn Ruiz, MA student in Communication

With consideration for interpersonal communications within a group setting, the literature suggests that specific nonverbal behaviors can positively influence the development of relationships between communicators. This study sought to identify and represent those behaviors and their relationship to a visitor's perception of welcome. Following video- and photo-elicitation interviews with the 20 student volunteers in this qualitative case study, data was collected and coded to reveal three overlapping categories of nonverbal behavior that impact a visitor's first-time experience in a Seventh-day Adventist Church. The repeated, consistent, congruent actions identified as kinesics, chronemics, and proxemics were seen to correlate with either a positive or negative participant reflection on the overall encounter. This information is compounded by the significant expansion of the communication model to include elements of attribution theory and expectancy violations theory in predicting the outcome of a nonverbal communicative encounter. Based on the identified behaviors, including handshaking; head nodding; leaning; smiling; a longer, but regulated length of interaction; socially-anticipated times of service; and spontaneous member-initiated encounters, recommendations can be provided to the church site and additional parochial groups interested in improving the welcoming visitor culture of their community.

B-Theology and History of Religion

- B-1** *Trinitarian Development in the Early Danish Adventist Church*
Paul B. Petersen, Department of Religion

The SDA Church went through a development of thinking in relation to the doctrine of the trinity, from outright opposition through skepticism to final acceptance. The similar movement, however, never took place in the early Adventist in Denmark which was never perceived as in conflict with the general Christian understanding of the trinity. This presentation, based on the Danish sources, will analyze the background and identify some reasons for this “anomaly”.

- B-2** *Lessons and Legacies of the Role of Scripture in Scottish Missions to Contemporary Missionary Praxis*
Kelvin Onongha, PhD candidate in World Missions

Scottish missions have played a pivotal role in missionary history in the continents of Asia and Africa establishing educational and medical institutions where the Scriptures could be taught. Through these institutions the influence of the Bible brought transformation to these societies with legacies that are enduring to this day. Unfortunately, however, this unforgettable period of mission history passed and all we are left with are its memories. This paper seeks to explore the essential qualities that gave vitality and impetus to this phenomenon, what made this experience unique among others, how did the Bible and their understanding of it contribute to their success, and what lessons they have for contemporary missions as they are conducted today.

- B-3** *A Lesson of Unity from Catholicism: The Experience of Maurice Blondel and Alfred Loisy during the Challenge of Modernism*
Davide Sciarabba, PhD student in Theology and Christian Philosophy

The search for unity pushed the leadership of the Catholic Church to reject modernism between the end of 1800 and the beginning of 1900. The official reaction against modernists, beside the official documents, was not very uniform. Some scholars were excommunicated by the Vatican, others were not. Though both French scholars, Blondel and Loisy received different treatment, Loisy was excommunicated, one year after the encyclical Pascendi, while Blondel received no personal warning or excommunication. An analysis of their writings shows that their thoughts were equally unacceptable for Catholicism. But Blondel's attitude was decisive, allowing him to continue in the Church and to influence the Church in the years to come, to the point that his writings opened the way toward Vatican II. The purpose of this paper is to show, through the lessons learned from the case of Blondel and Loisy, that attitude is the most important element to keep unity and to reform the Church at the same time. Dissent from the leadership of the church, even useful and lawful, is not in itself the issue. But attitude is the key of success to keep unity in the Church, being Catholic or Adventist. In Adventism, dissent from the leadership of the church might also be theoretically licit and necessary for growth, but still the right spiritual attitude is essential to reform the Church while keeping its unity.

- B-4** *The role of Christian Doctrine in contemporary Theological Interpretation of Scripture: a brief analysis*
Adriani Milli Rodrigues, PhD candidate in Theology and Christian Philosophy

One of the main features of the contemporary Theological Interpretation of Scripture movement is the idea that Christian Doctrine plays a crucial role in biblical interpretation. In this context, the role of doctrine in theological interpretation is particularly defined in terms of taking into account the rule of faith in the reading of the biblical text. However, a brief comparison between some scholars, such as Kevin Vanhoozer, Daniel Treier, and Robert Wall, shows that there are significant disagreements with regard to the concept of the rule of faith and its role in the interpretation of Scripture. In this sense, I attempt to clarify these disagreements and briefly analyze the hermeneutical use of the rule of faith in biblical interpretation. I contend that the hermeneutical role of the rule of faith in contemporary Theological Interpretation of Scripture is especially derived from notions about the nature and function of Scripture.

C- Biblical Studies

C-1 *Sentient or Silent? The Personification of Stones and Wood in Habakkuk 2* **A. Rahel Schafer**, Department of Religion and Biblical Languages

The portrayal of stones and wood in Habakkuk 2 highlights the utter corruption of the wicked, who build their houses through iniquity and by the blood of others. Reminiscent of the blood of Abel crying from the ground (Gen 4:10), the very stones and beams of the house cry out at the injustice and violence of the builder (Hab 2:11). The alliteration, assonance, and similar word length between verses 11 and 12 suggest a literal message that the stones and wood are to cry out. However, the parallel section in 2:18-19 reverses this literal depiction. Thus, it follows that Hab 2:11 is not assuming that stones and wood literally cry out, but is personifying them. The literary connections in Habakkuk 2 suggest that this personification mainly serves to draw attention to the connection between injustice and idolatry. Through indictment (2:11-12) and mockery (2:18-19), Habakkuk's personification of stones and wood graphically illustrates the links between idol worship and violent iniquity, perhaps even hinting at a causal relationship.

C-2 *Justifying the God of the Akedah: Interpretation as Theodicy* **Arlyn S. Drew**, PhD student in Theology and Christian Philosophy

Theodicies attempt to justify how an omniscient, omnipotent, omnibenevolent God could allow evil in our world. The Akedah (Binding of Isaac) intensifies this challenge for in Genesis 22:1-19, God Himself requires Abraham to offer his son as a burnt offering. Even though a ram was divinely provided at the end, disturbing implications about the morality of the divine Tester's methodology linger on. Because most theological interpretations of the Akedah attempt to justify God or Abraham's actions, this study will evaluate major interpretive traditions of the Akedah as theodicies, analyze the moral logic used and propose a comprehensive theodicy model that illuminates their relation to each other.

C-3 *The Deliverance of "I" in Rom 7:24-25* **Ronald Rojas**, PhD student in Old Testament

Most commentators believe that Rom 7:25a describes an expression of gratitude of "I" for being delivered. However, because the clause is verbless, it is debatable whether the author envisioned the deliverance as already past or still future. The importance of answering this dilemma underlies in the theological implications for the Christian living. If this passage refers to a post-conversion state (future deliverance), Calvinists are right in claiming that sinless life is impossible as long as we live here. But if it refers to a pre-conversion state (past deliverance), Arminians are right in saying that Christians are able to overcome sin. An exploration of the indicators of time and sequence in Rom 7-8 reveals that Rom 7:25a aims to an eschatological deliverance of the body of death rather than a past liberation from the law of sin.

C-4 *Representative Headship in Genesis 1-3* **Erick Mendieta**, PhD student in Old Testament

The topic of representative headship of Adam in Genesis has been suggested for scholars against woman's ordination. On the other hand, this idea has been overlooked or dismissed by scholars in favor of woman's ordination. However, three important issues calls for a careful consideration to ascertain if this concept is present in Genesis and if it does what are its implications: First, there is almost a consensus by New Testament scholars that the concept of representative headship of Adam is the foundation of Paul's argument for his Adam's Christology. Second, the concept of representative headship or federal headship is foundational to Reformed theology and finally it seems also that Ellen White suggests this idea. Is there in first three chapters of Genesis evidence to support the idea of representative headship and if there is, what is the scope of this representative headship?

D- Literature and the Humanities

D-1 *Shakespeare and the Cultural Olympiad: Contesting Gender and the British Nation in the BBC's Hollow Crown* **L. Monique Pittman**, Department of English

As part of the 2012 Cultural Olympiad celebrating both the Queen's Diamond Jubilee and the London Olympics, the BBC launched a season of programs entitled, "Shakespeare Unlocked." To boost cultural capital, the BBC partnered with the Royal Shakespeare Company and its World Shakespeare Festival as well as the British Museum. "Shakespeare Unlocked" featured a range of programming, including a documentary hosted by Simon Schama, scene performances and analyses by members of the Royal Shakespeare Company, and freshly produced, full-length adaptations. Described as "a season exploring how one man captured so much about what it means to be human," Shakespeare Unlocked most notably presented the plays of the second tetralogy in four feature-length adaptations that aired in June and July of 2012. These plays so obviously engaged with the question of English nationalism suited a year in which the United Kingdom wrestled with British identity in a post-colonial and post-Great Recession world. Released under the unifying title *The Hollow Crown*, these films project in the maturation of Tom Hiddleston as Hal a concept of British identity—Caucasian, male, and virile—rooted in surprising traditionalism and feature lamentably outdated approaches to casting and staging. In *Shakespeare Unlocked*, the BBC marshaled programming to showcase a British cultural icon, Shakespeare the Great Humanist, who captures "so much about what it means to be human." But *The Hollow Crown* reveals yet again that the gender and ethnic identity of that "human" continues to be defined, at least for the BBC, within fairly narrow borders.

D-2 *Physiognomy, Art, and Artifice in The Rape of Lucrece and The Devil's Law-Case* **Vanessa Corredera**, Department of English

Critics have noted two predominant, competing attitudes toward art in the Renaissance. For some, art was problematic because its artifice obfuscated reality. For others, art elevated humankind by allowing artists to create, like God. Early modern artistic treatises, however, reveal that artists also valued art because of its physiognomic ability. In other words, they believed that art could communicate the painted individual's true nature, attitude, and perhaps even secrets, especially through the face, a theory about art literary critics largely overlook. But even as artists acknowledged art's epistemological power, they also faced the potential idealization undertaken in any artistic endeavor, especially portraits, works of art most likely to signify physiognomically. These varied approaches to and ideas about art also appear in Renaissance literature. While many texts consider the status of art, in William Shakespeare's poem *The Rape of Lucrece*, the titular protagonist directly articulates and confronts the tension between art as physiognomic communicator and artificial epistemological obstructor, with a particular focus on the overlooked role of physiognomy and art. A similar interrogation of art's illuminative vs. deceptive status occurs in John Webster's drama *The Devil's Law-Case*. Yet Webster's text takes into account something *Lucrece* does not, the important role gender plays in both the creation and reception of art. Thus, by carefully considering the characterization of art in both *The Rape of Lucrece* and *The Devil's Law-Case*, we can examine the importance of physiognomy and gender, respectively, to Renaissance art's complicated status.

D-3 *The Moral Realism of Iris Murdoch* **Ante Jeronic**, Department of Religion

Even a scant acquaintance with current cultural and philosophical trends will readily point to a widespread predilection for subjectivist forms of moral reasoning. By "subjectivist" I refer to various non-cognitivist and constructionist paradigms in moral philosophy and popular parlance that reduce ethical statements to expressions of individual or collective preferences, feelings, or prejudices stripped of any object-given normativity. Furthermore, various poststructuralist and postcolonial "genealogies" tie the language of morality to discourses of power, patriarchy, and totalitarian agency. The conventional presumption informing such misgivings is that the quest for moral objectivism, and ethical norms in general, is either impossible or exclusionary, or perhaps both. My research project seeks to engage such criticisms through a critical exploration of Iris Murdoch's moral philosophy and her particular form of Platonism. I argue that Murdoch's thought presents a helpful corrective to voluntarist approaches to ethics and that her defense of metaphysical realism and transcendence offers fruitful avenues for theologians to engage her thought, including Adventist ones.

D-4 *Short Stories in the French Classroom: An additional way to seek knowledge, affirm faith and change the world?* **Sonia Badenas**, Department of International Language Studies

From the classical fables to the gospel parables, from the oldest runes to the last versions of "Chicken soup for the soul", short stories and related genres have been in all cultures significant instruments of communication. Used to teach ethics, to convey wisdom, to transmit knowledge, to awake spiritual enlightenment, or merely to entertain, short stories of all sorts have played an important role in the history of education. In my personal experience as a professor of French, I have verified that short stories, as reading assignments and operating tools, present advantages over other educational tools. They are, in fact, especially useful in three dimension or areas that I consider essential in a holistic education; learning, enjoyment and values. (1) First of all, the use of well-chosen short stories for teaching French has clear didactic advantages over most of the texts commonly found in traditional French manuals. Short stories allow working with authentic texts, written with the real language of native speakers. They enrich the linguistic and cultural level of the students while providing high standard of quality in the target language. (2) Besides this, short stories are more attractive than other texts for their length. We can select them so that they are intriguing, playful, festive and fun. (3) And finally, they offer an absolute variety of subjects, either if they are of popular origin or if they are literary works. Dealing with real life, short stories provide stimulating material for critical thinking and discussion on culture, ethics, values and faith issues.

E- Chemistry and Engineering

- E-1 *Evaluation of the Electrical Resistance and Capacitance of a Di-Electric Electro-Active Polymer*
Boon Chai Ng, Department of Engineering and Computer Science

Dielectric Electro Active Polymers (DEAP) have the potential of converting mechanical energy into electrical energy. DEAP consists of a silicone dielectric film material with a special corrugated surface and a very thin layer of metallic electrodes on both sides of the surface allowing for large mechanical deformations with low operating forces. This work examined how the DEAP capacitance and the electrode resistance were affected by repeated stress relaxation cycles.

- E-2 *Isolation and Structure Determination of Carcinogenic Arginine-Based Heterocyclic Amines*
Ryan T. Hayes, Tyler Pender, J.C. Lynch, Zach Reichert, Andrew Stewart, Department of Chemistry and Biochemistry

It is well established in scientific literature that cooked meat and fish produce heterocyclic amines (HCA) which are mutagens and/or carcinogens. The formation reaction of HCA typically involves creatine/creatinine from muscle tissue with various amino acids under anhydrous conditions and high temperatures. However, our research and peer-reviewed literature suggests there are a series of HCA compounds that are formed from arginine rather than creatine. Previous work has shown that mutagenic compounds are formed with arginine and various amino acids but no compounds were isolated. Therefore our goal is to isolate and identify the chemical structures of arginine-based HCAs as well as assess their relative mutagenicity. Arginine is found in high amounts in many plants especially soy-based food items. Overcooking proteinaceous plant foods may be carcinogenic and we seek to understand whether or not this is true.

- E-3 *The Products of Research*
Desmond Murray, Department of Chemistry and Biochemistry

Discussion of why we do research and other fundamental questions relevant to our university's aspiration to increase research capacity and productivity. This talk will raise questions regarding misconceptions of the research enterprise; the false dichotomy between curiosity and utility as motivation for research; and how early research participation is a game-changer both in science education and the research enterprise. In addition, the question of whether research is a secular activity or a sacred vocation will be addressed.

F- Culture and Society

- F-1** *European Integration and Corporate Interests: winners and losers*
Marcella Myers, Department of History and Political Science

The question of globalization and its effect on national governments is an ongoing debate and is marked as one of the culprits leaving national governments at the mercy of international financial markets (Strange 1996). As Martin has observed, it is hard to resist the impression that trans-border economic activity have changed the environment in which welfare states operate, making it impossible for them to perform the distributive functions they performed in the early postwar era (Martin; Huber and Stephens 2001). However, the problem may not be an inability for national governments to act control national budgets and financial markets but a lack of political will. Where there may be little political will, economic interests have proved to be an important impetus for European integration. If this is the case, what are the implications for further political integration and for the democratic participation of EU citizens?

- F-2** *Choice and Motivation in Indigenous Language Revitalization*
Janet Blackwood, Department of English

There has been a considerable amount of research undertaken to explore the motivations for second language learning and the choices speakers make regarding language learning and use. However, this research has seldom extended to examining the motivations influencing language choices in contexts where an indigenous language is in danger of becoming extinct. Using data gathered from a larger study on language attitudes and practices, this presentation examines the language choices of members of a Bribri indigenous community in Costa Rica, the motivations which appear to influence these choices, and the implications of the study findings for current language revitalization efforts in Costa Rica.

- F-3** *Accidental Path Dependency in the Evolution of Gender Equality in Madagascar*
Joel Raveloharimisy, Erenly Agosto, Department of Community and International Development

This paper analyzes the interaction of endogenous and exogenous variables that contributed to the advancing of gender equality in Madagascar since its independence in 1960. We use path dependency approach to analyze different national policy events in relation to gender equality. We found that evolution of gender equality in Madagascar has been accidental. Even though the Malagasy government had intentions to promote gender equality their efforts did not have a significant positive outcome due to competing interest among policy actors and available resources.

- F-4** *My Cross-Cultural Journey: An Autobiographical Analysis of the Challenges and Negotiations in Entering the World of Unfamiliarity*
Ellen Rodrigues, PhD student in Curriculum and Instruction

This autobiographical account describes my personal experience as an international student in the United States, as a way to reflect on the misconceptions, challenges, and adaptations of my school life journey. My overseas experience created conflicted situations while entering the world of unfamiliarity, as well as provided deeper awareness of matters related to identity, culture, and power relations. My theoretical approach will be based on Schumman's Acculturation Model and Aoki's curriculum-as-lived perspectives, which will serve as guidelines for the critical analysis of my autobiographical narratives of schooling experiences in higher education. In this trajectory, in each narrative I articulate my cultural, linguistic, and social shock as I perceive my own limitations, the enunciatory spaces of difference, and attempt to understand my new self as a nonnative speaker. Overall, my integration was influence by: (1) the living experience with the social community; (2) the acquisition of self-esteem, confidence, and a positive attitude; (3) the ability to learn to adapt and learn the nuances of the new world; and (4) the deeper sensibility of the teachers.

G- Biology, Mathematics, and Art

G-1 *Hot and Bothered I: Climate Change, Cannibalism, and Ovulation Synchrony*

James L. Hayward¹, Shandelle M. Henson², and Lynelle M. Weldon², ¹Department of Biology, ²Department of Mathematics

Climate change brings with it a variety of unexpected consequences. El Niño-Southern Oscillation episodes mimic conditions of a warming climate except on a shorter timescale. We found that marine gulls nesting in the Pacific Northwest cannibalize significantly more of their neighbors' eggs during El Niño events than during other times. El Niño events are associated with higher sea surface temperatures which, in turn, depress marine food webs and reduce the amount of food available to gulls and other marine birds and mammals. Despite the risk of attack from parent birds, an egg cannibal can obtain half its daily energy requirement simply by stealing and eating one of its neighbor's eggs. Consequently, cannibalism is more common when sea surface temperatures rise. But female gulls seem to have developed a surprising adaptation to reduce the chance that one of their eggs will be cannibalized. This adaptation is the topic of the next talk, "Hot and Bothered II: Climate Change, Cannibalism, and Ovulation Synchrony", by Shandelle Henson.

G-2 *Hot and Bothered II: Climate Change, Cannibalism, and Ovulation Synchrony*

Shandelle M. Henson¹, James L. Hayward², ¹Department of Mathematics, ²Department of Biology

In the previous talk, "Hot and Bothered I", we found that increasing sea surface temperatures (SST) are associated with a lack of food for surface-feeding marine birds, which leads to a higher rate of egg cannibalism in seabird colonies. If more eggs are laid at one time, each egg has a smaller chance of being cannibalized due to "predator satiation"; hence, ovulation synchrony could confer a selective advantage in the presence of egg cannibalism. We demonstrated the existence of ovulation synchrony in two species of colonial birds and formulated the following hypothesis: Rising SST and its concomitant food scarcity selects for cannibalism, which in turn selects for reproductive synchrony.

G-3 *Hot and Bothered III: Climate Change, Cannibalism, and Ovulation Synchrony*

Lynelle M. Weldon¹, James L. Hayward², and Shandelle M. Henson¹, ¹Department of Mathematics, ²Department of Biology,

The previous two talks discussed the implications of a finding that increased sea surface temperatures are associated with a higher rate of egg cannibalism in seabird colonies. This is very interesting—if it is true. How did we conclude that sea surface temperatures is a relatively important variable in predicting the rate of egg cannibalism? Do gulls learn formulas in order to know how to behave? Why should biologists learn about an information-theoretic approach to data analysis (as opposed to null-hypothesis testing)? We will discuss these questions at an introductory level.

G-4 *Vessels for the Kool-Aid Ceremony*

Steve Hansen, Department of Visual Art and Design

I will be discussing my latest series of teapots, "Vessels for the Kool-Aid Ceremony", which have been included in national juried exhibitions such as Hot Tea, and The Teapot Redefined. I will also unpack "Problem Girls" a sculpture that won "Best of Show" at the Michiana Annual Art Competition, and the "ACLU Award" at ArtPrize. The teapot series, "Vessels for the Kool-Aid Ceremony" concerns the Meta stories in our visual culture. These stories are now primarily derived from commercials, advertising, and product tie-ins from movies and television. While a typical person a few hundred years ago could have probably told you the stories of a dozen saints, and been able to identify them, our culture today is far more adept at identifying brands, or pop icons with only partial visual information. This series of work seeks to jar the viewer into seeing some of those images in a new way. I have "branded" my pieces with multiple trademarks, mascots, and logos. These brands form new brands, and create a new narrative for each piece. These works are meant to look like future relics from our age of hyper capitalist visual culture.

POSTER PRESENTATIONS

Agriculture

P-01 *An evaluation of electrical conductivity as a practical tool in mastitis detection*

Carrie Mesiar¹, Jerome Thayer², Katherine Koudele¹, ¹Department of Agriculture, ²Center for Statistical Services

Objective: determine the practical use of milk electrical conductivity (EC) change detection technology at the A.U. Dairy in detecting clinical mastitis (CM). An increase in EC > 20% above baseline was a “spike.” If a spike was followed <10 days by an episode of CM then a “true alarm.” If not, then a “false alarm.” A “false negative” was an episode of CM occurring without a preceding spike. Bayes’ Theorem was applied to the probability of spikes and incidence of CM: $P(M|S) = \frac{P(S|M)P(M)}{P(S|M)P(M) + P(S|NM)P(NM)}$ where $P(M|S)$ is the probability of CM given a spike, $P(S|M)$ is the probability of spike given there was CM (true alarms), $P(S|NM)$ is the probability of spike but no CM (false alarms), $P(M)$ is the probability of a cow having CM in the herd, and $P(NM)$ is the probability of a cow not having mastitis [$1 - P(M)$]. A spike correctly predicted CM in 29.615% of cases but false alarms were 70.385%. Correctly predicted CM was 52.294% but 47.706% of the episodes were unpredicted. Therefore, $P(M|S) = 0.1059\%$. Conclusion: EC change detection technology was not a reliable predictor of CM for use in the milking parlor to detect CM.

P-02 *A Survey of Socio-Economic and Xeriscapic Plants of Jordan as an Educational Tool for Tourism at Tall Hisban, Jordan Archaeological Park*

Stanley Beikmann, Department of Agriculture

The 2013 Research Poster will provide a report on the installation of a socio-economic garden and amphitheater at the entry to Tall Hisban Archaeological Park, Jordan. The research and synthesis of xeriscapic and socio-economic plants, that have sustained the Jordanian people for centuries, has been completed. An interpretive garden has been constructed and signed, for the purpose of educating visitors who come to Tall Hisban Archaeological Park. The focus is on their heritage and the heritage of the site through an educational exhibit on sustainable plants and water harvesting methods. The garden also becomes an orientation amphitheater for all visitors who first enter the park. A further study of xeriscapic ornamental plants for potential introduction into the U.S. was also included in our 2013 work.

Architecture

P-03 *Artist working with the Cavan Burren Research Project*

Robin Johnson, Rhonda Root, Department of Architecture

This summer documentation of the ancient archeological site in the Cavan Burren commenced. Our purpose was aiding protection of an archeologically significant relic landscape, influencing local ecosystem management policy, and working through details for future Andrews University art and architecture student participation that offers valuable ‘real world’ experience. The Cavan-Burren lies within the Marble Arch Caves Global Geopark, in northwest Ireland along the Fermanagh/ Cavan national border. The lack of industrial development and intensive land-use, partly due to the volatile political history in this part of the world, has left this beautiful and once heavily populated landscape relatively undefiled. Our site was recently deforested through the harvesting of plantation trees, exposing archeological features that had been invisible for decades. The region contains roughly 90% of all geological formations and material types present on the entire planet as well as the sources of the three primary rivers of Ireland. Our primary documentation method involved experimental photogrammetry of representative monument types. Digital photos were stitched into “123D Catch”, from which a digital 3D mesh was created. This process enables virtual manipulation to verify important relationships without disturbing the archeologically significant objects themselves. Objects were also documented using traditional archaeological drawing techniques.

Distance Education

P-04 *An investigation of the relationship between student activity patterns and successful course completion in self-paced distance courses*

Janine Lim, Department of Digital Learning and Instructional Technology

Student completion is a key indicator of the quality of open and distance learning. This study examined whether student activity patterns in a self-paced course are related to successful completion of the course. Research hypotheses were that there is a relationship between students’ completion and time-based and sequence-based activity patterns. The study included 543 students in 89 different general education courses from January 2011- December 2012. The courses offered came from a range of disciplines, including humanities, math and science. Student dates of registration and assignments submitted were analyzed. The results of this study suggest that some student activity patterns in a self-paced course may be related to their successful completion.

Education

- P-05** *Following Faith Commitments: How High School Graduates Successful Transition into Adventist Higher Education*
Larry D. Burton¹, Josephine E. Katenga², Christine Moniyung², ¹Department of Teaching, Learning, & Curriculum,
²Curriculum & Instruction Ph.D. Candidate

An estimated 66% of Adventist high school graduates who go on to pursue a college degree never enroll in Adventist higher education. This study sought to create a theory to explain and predict how public high school graduates successfully transition into Adventist higher education and persist to degree completion. This study was the second phase of a sequential QUANT-Qual mixed-methods investigation funded by the colleges and universities operating within the North American Division. The resulting theory centers on one key concern shared by study participants – “Following Faith Commitments.” The theory consists of five components articulated across four domains of student experience. The five components of the theory are Attractors, Adjustors, Detractors, Transitional Tasks, and Anchors. These components emerge across the following four domains of student experience: Relationships, Romance, Personal Spiritual Journey, and Mental Maturation. As public high school graduates enter an Adventist university, the Adjustors, Detractors and incongruences they encounter require create the need for students to successful complete Transitional Tasks within each domain of experience. Successful completion of these Transitional Tasks leads to the creation of Anchors which help the student persist to graduation.

- P-06** *Attitudes towards Adventist Education in Sabah, Malaysia*
Jimmy Kijai, Department of Graduate Psychology and Counseling

Relative to membership growth, there has been a steady decline in enrollment in most of the Adventist elementary and both of the secondary schools in Sabah Malaysia. This study was undertaken to examine the attitudes of the Adventist constituent members towards Adventist education. Data was collected using a survey questionnaire between March and October of 2012. The questionnaire was given to all conference workers, school teachers and parents in randomly selected churches. Overall, attitude towards Adventist education is positive, with strong religious/spiritual environment. However, most believe that public schools are better than Adventist schools. Over 50% of the respondents (teachers, pastors and members) reported that Adventist schools should consider receiving direct government funds. Primary reasons for not sending children to Adventist schools are location, cost and quality. Only slightly over two-thirds of the pastors appear to indicate strong support for Adventist education. This study has implication for marketing, branding and promotion of Adventist education in Sabah, Malaysia.

- P-07** *Characteristics of Adequate and Inadequate Responders in a Fluid Multi-Tier Model*
Luana L. Greulich¹, Stephanie Al Otaiba², ¹Department of Graduate Psychology and Counseling,
²Department of Teaching & Learning at Southern Methodist University

Despite the widespread use of Response to Intervention (RtI) since the revision of IDEA 2004, there is a paucity of research describing both instruction and intervention within a fluid multi-tiered model. The present study used a mixed methods approach to learn more about differences in initial skills and child characteristics between adequate and inadequate responders during a year-long fluid multi-tier RtI model. Three research questions were asked, the first two questions compared 147 students who received intervention at Tier 2 and 3, but who were adequate responders compared to 23 students who were inadequate responders based upon initial criteria using a Discriminate Function Analysis (DFA). The third question included only the inadequate responders (23) looking in depth and coding their behavior and emotions during intervention. The DFA showed that teacher judgment, initial language, and literacy skills adequately predicated group membership based upon the initial criteria. Adding child characteristics to the initial skills did add a unique variance, but there was very little difference between the two models. The inadequate responders did show specific emotions and behavior during intervention; however it did not yield any specific information that would help teachers and administrators to identify inadequate responders from adequate responders.

English

- P-08** *“I Don’t Understand What You’re Saying!”: Lessons from Three Tutoring Sessions between ESL Writers and Native English Speaking Tutors*
Julia Kim, Department of English

Writing center staff often expresses their frustrations of falling into the trap of doing what they least desire: editing papers rather than engaging in a collaborative dialogue when working with ESL students. The analyses of three tutoring sessions between native English speaking tutors and ESL students reported in this study tell compelling stories, offering hope, as well as providing clear warning signs that should be attended to. The student’s willingness and confidence in expressing his or her thoughts was a key to a successful tutoring session, and the ESL students’ repeated confirmations through various echoing phrases could actually signal lack of understanding and competence on the students’ part. The study shows ESL students need as much guidance in communicating their needs and should be provided with linguistic tools as well as a nurturing atmosphere where they can freely, not hurriedly, voice their problems, challenges, and confusions.

Social Work

P-09 *The Relationship between Volunteering and Church Attendance and Retention among Seventh-day Adventist Faculty and Staff: Preliminary Findings*

Curtis J. VanderWaal¹, John T. Gavin¹, Alissa R. Mayer², William Ellis³, ¹Department of Social Work, ²MSW Candidate, ³Department of Political Science at Washington Adventist University
Presented by **Jan Wrenn**

Volunteering in church and community service projects appears to be a contributing factor in church retention. Research on church attendance suggests that social networks, rather than beliefs, are a primary motivator in volunteering both within and outside of the church (Becker & Dhingra, 2001). Similarly, church attendance may influence volunteering by fostering a sense of community (Beck & Park, 2000). However, the relationship between church retention and volunteering is not well understood, particularly within the SDA church. In 2012, researchers collected survey data from 530 SDA faculty and staff at nine SDA colleges and universities across the U.S. One of the study's purposes was to explore the relationship between personal religious practices and levels of church and community volunteering. Findings show that 60% of respondents worked on a community project in the past year, with 54% saying they had volunteered for church work monthly or more frequently. Further, as church attendance, prayer and Bible study increased, so too did volunteering. Implications for church attendance and retention will be presented.

Music

P-10 *Musical Composition Efficiency Project*

Kenneth Logan, Department of Music

From especially May 2011 to present, I have composed, and continue to compose, drafts of many incomplete original musical compositions. This project utilizes the assistance of a student working on such compositions, preparing them for such purposes as performance, publication submission, and self-publication. The student is assisting mostly using Finale notation software, in such functions as expanding "short scores" into full ensemble scoring, and in such tasks as adding dynamics, articulations, slurs, etc. and editing scores for clarity and graphic excellence. Beginning in August 2013, Priscilla Soto (Bachelor of Music in violin performance student) and I have made major progress on five movements of two concertos for organ and orchestra. The Celebration of Research poster will document stages in the genesis of one of these five movements. In addition, we have progressed on two unaccompanied choral compositions (*This Little Babe* and *The Giver Given*) on texts by Robert Southwell (c1561-1595); *Aspirations* for oboe and choir on a text by William Huber, Jr.; and *Psalms of Ascents* for symphony orchestra.

P-11 *In Search of Medieval Irish Chant and Liturgy: A Chronological Overview of the Secondary Literature*

Marianne Kordas, Music Library

The study of liturgy and chant in medieval Ireland not only informs our understanding of early insular Christianity, but also illuminates the broader practices of the Church throughout the medieval world. This study provides a historiographical overview of the secondary literature on Irish chant and liturgy from 1881 to 2005.

Visual Art and Design

P-12 *Proximity*

Kari Friestad, Department of Visual Art and Design

My current work centers on the experience, effects and phenomena of social networking. A progressively common aspect of this feature of modern culture is disconnection from the immediate social environment, facilitated by a total absorption in the ubiquitous online connection. Within a society dominated by a frenzied image-saturated culture, personal identity is now aligned with an online persona. We are defined, debatably in narrow terms, through the vehicle of the online profile, available on a huge range of available networks, gaming pages, work sites, personal websites, dating sites, blogs and more—by our comments, our likes and dislikes, what we eat, who we vote for, how we look, what music we like, what we believe, and our vacations. We manufacture our virtual identity, however deliberately, through images and the increasingly reflexive "status update," similar to the image crafted by celebrities and public figures. The digital world redefines the rules of boundaries, communication styles, personalities, and personal identity. We acknowledge that "connection" is a good thing. Connection is why we network. With this in mind, my work has two themes: the dichotomy between the potential digital connection and disconnection from people in proximity; and the imagery created by the pursuit of these connections.

P-13 *Evidence: A Body of Constructed Images*

Marc Ullom, Department of Visual Art and Design

I am interested in how we remember. I am intrigued by the mystery of photographs that hint of an idealized memory or place, or even a dark hidden fragment, a thing barely tangible. So often our memories are flawed and imprecise, just shards of an experience of a place or time. Often they are jumbled and chaotic. Very rarely is a memory so crystalline that we can conjure up all the details, so it is with these qualities in mind that I create my constructed still lifes. This body of work uses representations of the human form and visual cues such as bottles, twigs, seeds, and string to visually reconstruct fragmented memory. My intent is to create images that cause the viewer to pause and ask questions about the elements in the work and to create relationships between the elements that have no singular interconnection, but that allow each viewer to project their experience into the images.

Library

- P-14** *The Academic Library Partnership with Faculty and Students: The case of James White Library at Andrews University*
Silas M. Oliveira, James White Library

Libraries have a long history of collaborating with its immediate community. In the case of academic libraries, this collaboration happens between the library, faculty, and students, mainly. The James White Library at Andrews University is effectively pursuing to narrow and strengthen this collaboration by offering services which will move this effort to a higher level of service - mainly, to become real partners with teachers and students in the learning experience. The objective of the study, therefore was to (1) define the concepts of collaboration, partnership, and the “embedded” librarian, presenting and discussing its differences and how it affects the level of services offered and the image the community of users has about the library, and how this impacts its value and effectiveness. Twenty services offered by the James White Library were analyzed. It was found that a total of 17 followed the collaborative model, 3 the embedded, and none the partnership.

- P-15** *DIKW Goes To Seminary: Applying the DIKW Hierarchy to the Use of Sources*
Terry Dwain Robertson, James White Library

In Information Science studies, the Data/Information/Knowledge/Wisdom (DIKW) hierarchy is a conventional construct for making sense of the terms. However, when applied in any given discipline, the distinctions become challenged and the hierarchy appears to fail. I suggest that the reason for this is the tacit classification of this hierarchy as an ontological narrative. With context appropriate definitions and delimitations, the DIKW hierarchy can still be useful for specific applications in information literacy pedagogy. This is illustrated in the context of theological education by using the construct to differentiate the identification of primary sources in the Seminary disciplines.

Business

- P-16** *School of Business Administration Publications*
School of Business Administration

A collection of research presented/published by faculty of the School of Business Administration.

Biblical Studies and Theology

- P-17** *Cultural Backgrounds to the Biblical Book of Esther*
Constance Gane¹, Christie Chadwick², Erika Mikkelsen³, ¹Department of Old Testament and Institute of Archaeology,
²PhD student in Archaeology, ³BS student in Speech Pathology and BA Theology

The biblical Hebrew book of Esther closely reflects and interacts with the rich cultural backdrop of the ancient Medo-Persian empire during the reign of Xerxes, against which its drama is played out. The subject areas of investigation that my research is focusing on, but not limited to, include the lives of women in the Persian royal court in terms of their involvement in affairs of state, dynamics of polygamy in relation to social hierarchy, daily routines and quality of life, loci of access in palace architectural geography, and implications of these for understanding moral and ethical issues and behaviors reflected in the book of Esther, such as Esther’s choice to conceal her identity and undergo a high degree of cultural assimilation for survival, her marital (including sexual) relationship with Xerxes, and her harsh treatment of enemies of the Jews. The study interacts with the Hebrew Massoretic text, the Septuagint, as well as a wealth of extrabiblical data illuminating the diverse cultures of the empire during this historical period, including fairly recent archaeological discoveries that shed light on the lifestyles and societies of royals, nobles, military and civil servants, and commoners.

- P-18** *Not One Man: The Leadership Controversy of the 1870s*
Kevin M. Burton, MA student in Theology

In the early 1870s, the Adventist church struggled in regard to leadership. In late 1873, General Conference President, George I. Butler, attempted to bring resolution to these issues by writing a tract upon the subject. When Butler presented his Leadership on November 15, it was unanimously accepted as the official Seventh-day Adventist position on leadership. Within one year, major issues regarding the philosophy of Butler’s Leadership began to unfold. In fact, by November 1874, leadership had “exploded.” As a result, many attempts were made to bring about harmony and reestablish peace within the ranks of Sabbath-keepers. After about four years of struggle, the controversy was finally resolved and certain aspects of Butler’s Leadership were rescinded. This poster will provide a brief overview of the leadership controversy that waged throughout the 1870s within the SDA Church. It will highlight the three primary views of leadership that arose at this time, and illustrate the major events that took place in a concise manner.

P-19 *The Beyond Beliefs Study: Early Baptism*

Paul B. Petersen¹, Jan A. Sigvartsen², Leanne M. Sigvartsen³, ¹Department of Religion and Biblical Languages,

²PhD student in Old Testament, ³PhD student in Theology at Avondale College

There has been a strong emphasis in the Seventh-day Adventist Church in North America to baptize young people prior to reaching high school as it is believed this practice may be associated with membership retention within the Seventh-day Adventist Church. However, it is unknown how these young people, upon reaching early adulthood, feel about early baptism and if they have a comprehensive knowledge of the 28 Beliefs of Adventism. The Beyond Beliefs study Cohorts 1, 2 and 3 identified that there may be an unforeseen consequence of early baptism in that young adults possess a limited knowledge of the official 28 Beliefs of Adventism and factors other than personal conviction contribute to their decision to be baptized prior to age 14. A number of participants expressed negative feelings relating to the practice of early baptism and 62.5% of those baptized prior to age 14 expressed that if could they do it again, they would have waited until they were older to be baptized. Paternalism and the potential implementation of an alternative practice for children, tweens, and early teens, other than baptism, are discussed. The Beyond Beliefs study is an ongoing study and this issue will be investigated further in Cohorts 4 and 5 which are scheduled for Spring 2014.

P-20 *The Beyond Beliefs Study, Cohort 1: An investigation into the knowledge and attitudes Young Adults have of the 28 Beliefs of Adventism*

Paul B. Petersen¹, Jan A. Sigvartsen², Leanne M. Sigvartsen³, ¹Department of Religion and Biblical Languages,

²PhD student in Old Testament, ³PhD student in Theology at Avondale College

At present, it is relatively unknown how young adults who identify as Seventh-day Adventists really feel about each of the official 28 Beliefs of Adventism. The first cohort of the Beyond Beliefs Study asked a sample of young adults who were undertaking RELT225 Doctrines of Adventist Faith to write a 150 word response to each of the 28 Beliefs of Adventism. From these responses researchers identified what aspects of these beliefs resonate (both positively and negatively) with this demographic group. Two demographic inventories were also administered. These instruments also identified a number of sociocultural and religious attitudinal perspectives and the knowledge levels of the 28 Beliefs. Preliminary findings suggest that young adults from the North American Division predominantly like the 28 Beliefs, particularly those that provided either a real or abstract benefit for them personally or had a relevant application for their life here and now. Thus, the challenge for the Seventh-day Adventist Church in North America, when addressing young adults, is not primarily to convince them of the strengths of the 28 Beliefs of Adventism, but rather, to demonstrate how each belief benefits them and can be applied in their lives right now. Additional cohorts for the Beyond Beliefs study will be added in the Fall 2013 and Spring 2014 semesters.

Biology

P-21 *Hunger in paradise? Seasonal variation in plant availability to manatees in the flooding wetlands of Tabasco, Mexico*

Daniel Gonzalez-Socoloske, Department of Biology

Understanding foraging ecology is an important element of effective conservation strategies. While it has been suggested that some populations of Antillean manatees inhabiting freshwater systems experience seasonal availability to food, no study has examined it quantitatively. In this study, plant species richness, diversity, and abundance were examined monthly in four contact lakes in the wetlands of Tabasco Mexico from August 2010-July 2011. A total of 415 plots were surveyed, in which 72 plant species were identified representing 63 genera and 45 families. Only one submerged species was found. Water levels fluctuated more than 6 m, and based on the water levels the following seasons were determined: high water (September-October), receding water (November-February), low water (March-June), and rising water (July-August). Plant species richness, diversity, and abundance were greatest during the rising water season and lowest during the low water season. No plants were available in April-June, which represented the majority of the low water season. Species richness, diversity and abundance were significantly affected by month and positively associated with water levels. The availability of the different plant growth forms was also significantly influenced by season. Despite the relatively high plant species richness and abundance found in the habitat, on any given month manatees in Tabasco had access to only 0-39 species and an average of 14. In addition, they had very restricted or no access to plants during the low water season, which suggests they were forced to fast. This may have important implications for rehabilitation and relocation efforts of stranded and orphaned manatees. If reintroduction efforts are to succeed, the variability of plant species and abundances demonstrated by this study should be taken into consideration when feeding captive animals that are going to be released back into the wild.

P-22 *Phonotaxis in Male House Crickets, Acheta domesticus*

David Mbungu, Erik Thordarson, Department of Biology

Calls of male crickets convey both reproductive and territorial intentions of the caller. Reproductively mature conspecific females use these calls to judge the quality of the caller and walk toward the source of the call (positive phonotaxis). Males of a few cricket groups also exhibit positive phonotaxis though for different proximate reasons than those hypothesized for females. We placed male house crickets, *Acheta domesticus*, in a circular arena and presented them with electronically synthesized model calls that differed from each other only in syllable periods. Seven syllable periods that ranged from 30msec to 90msec were used in this setup. Our Results revealed that male responses to calls with a syllable period of 50 msec had an earlier commencement and were more consistent than those of any other syllable period. However, age led to a progressive change in male responses and eventually resulted in those that were more than a month old responding to different syllable periods indiscriminately. The tuning of male and female auditory systems to calls of similar temporal structure indicates a common underlying genetic basis.

P-23 *High-resolution Record of Temporal Variation in $\delta^{13}C$ from Intra-Tooth Sampling of Incisor Enamel of Free-ranging Thirteen-lined Ground Squirrels*

J. Andrew Brassington¹, Alexandra E. Chacko¹, Woo Jong Jang^{1,2}, Brooke Kisser³, Benjamin H. Passey⁴, and H. Thomas Goodwin⁵, ¹BS student in Biology, ²School of Medicine at Loma Linda University, Loma Linda, CA, ³Biology Department at Everett Community College, Everett, WA, ⁴Department of Earth and Planetary Sciences at Johns Hopkins University, Baltimore, MD, ⁵Department of Biology

We tested the hypothesis that $\delta^{13}C$ profiles of incisor enamel from free-ranging thirteen-lined ground squirrels (*Ictidomys tridecemlineatus*) record seasonality in diet. We used laser ablation to densely sample lower incisor enamel (on average, one sample per 3 days of tooth growth) from 20 squirrels collected in SW Michigan, and analyzed samples using GC-IRMS. The basal ~20-35 increments of record always displayed a negative trend in $\delta^{13}C$, probably reflecting contamination by organic carbon in developing enamel; we excluded these values. At one colony, squirrels collected within 25 m of a cornfield displayed significantly higher and more variable $\delta^{13}C$ (variable C4-rich diet; mean=-5.03, SD=2.38, n=6) than did squirrels from mowed lawn distant from the cornfield (C3-rich diet; mean=-13.92, SD=0.61, n=6); this pattern persisted from early May-late August and was confirmed to reflect dietary differences ($\delta^{13}C$ of fecal pellets). Both groups displayed a positive excursion in $\delta^{13}C$ in late August. Late-season use of C4-rich vegetation was also documented at a second colony (n=8) without access to a cornfield, studied in late summer through hibernation. Isotope values peaked rapidly from mid-August to mid-September, and subsequently dropped precipitously to hibernation. We suggest rodent incisors as possible recorders of fine-scale seasonal variation of interest to paleoecologists.

P-24 *Changes in the selectivity of phonotaxis and its neuronal correlates in response to prothoracic nanoinjection of modulators in female cricket Acheta domesticus*

Benjamin Navia, Ashley Groeneweg¹, Gordon Atkins, John Stout, Department of Biology, ¹MS student in Biology

Phonotaxis in female crickets exhibits variability. While some females respond to calling songs typical of the males' (syllable periods, 50–70 ms), others only respond to calling songs with shorter or longer syllable periods, outside the range of males' calling songs. Other females lack selectivity and respond to the full range of calling songs. Nanoinjection of histamine into the prothoracic ganglion decreases phonotactic selectivity. Nanoinjection of antihistamine has the reverse effect. Nanoinjection of Juvenile Hormone III increases phonotactic selectivity, while nanoinjection of chelethrine chloride blocks the effect of Juvenile Hormone III. This suggests that Juvenile Hormone III exerts its effects through a protein kinase C pathway. The effect of Latrunculin on selective females is currently being tested. Preliminary data suggest Latrunculin reduces the effect of Juvenile Hormone III. The L3 prothoracic interneuron in female crickets responds selectively to the syllable period of the male's calling song and it has been proposed to be responsible for syllable period-selective responses during phonotaxis. If this is true, then L3s should show variable responses that parallel the phonotactic behavior. Preliminary findings show L3's selective responses decrease as a result of histamine applications. Sequential application of Juvenile hormone III and PKC-inhibitor also decrease L3's selectivity and supports the hypothesis that processing by L3 contributes to the syllable period selective phonotaxis observed in this species.

P-25 *Male exposure reduces the response of female crickets (Gryllus bimaculatus) to the male's calling song: The roles of two auditory neurons*
John Stout¹, Leslie Samuel², Steven Lee³, ¹Department of Biology, ²Department of Physical Therapy, ³BS student in Biology

We have evaluated female phonotaxis (walk toward males' calls) using virgin and male-exposed (raised in the same container) females. While nearly 100% of virgin females respond phonotactically, about 40% of male-exposed females do not respond to models of the males' calling songs (CSs) and those that respond (60%) exhibit quantitative differences in their responses. In virgin females, the AN2 neuron receives excitatory stimulation from the cricket's ear and responds selectively to model CSs that represent the CSs of calling males. This selective response is very significantly correlated with the same female's behavioral response to that call. In many male-exposed females, the AN2 neuron does not respond selectively to the CSs that represent calling males. This difference is the result of inhibitory input from the ON1 auditory neuron that in many male-exposed females, "destroys" AN2's selective response to models of a calling male's calling song. AN2s in virgin females that are "forced" to respond to model CSs similarly to the AN2 responses in male-exposed females are highly correlated with the failure of the virgin female to respond phonotactically to that CS.

P-26 *Incorporating case studies into an undergraduate genetics course*

Marlene Murray, Department of Biology

Genetics is considered one of the most challenging courses in the biology curricula at both the secondary and post secondary levels. Case based teaching has been shown to improve student perception and performance outcomes in both non-science and science courses. Thus in an effort to improve outcomes, case studies were integrated into an undergraduate genetics course as a supplement to lecture and replacement to recitation. Student perception and performance when case studies were used was compared to two previous years before the incorporation of case studies. Student course evaluations, pre and post surveys of student knowledge, and exam scores indicated that when case studies were used student perception improved while student performance showed mixed results.

P-27 *Subcellular distribution of carboxypeptidase O affected by nutrient availability*

Peter J. Lyons¹, Donnel Dockery², ¹Department of Biology, ²BS student in Biology

Carboxypeptidase O (CPO) is a member of the M14 family of proteolytic enzymes. Many members of this family of enzymes are secreted from cells and are involved in degradation of extracellular peptides; other carboxypeptidases remain within the secretory pathway of the cell where they are involved in the maturation of bioactive peptides. In order to determine the function of CPO, the subcellular localization of CPO was determined by immunofluorescence analysis. CPO, stably expressed in Madin-Darby canine kidney cells, was found in a punctate pattern partially associated with lipid droplets. When cells were serum-starved the structures associated with CPO became more numerous and often clustered. Addition of oleic acid to the medium caused CPO to be redistributed in a diffuse pattern with some concentration on the nuclear envelope. Western blot analysis of CPO following oleate incubation indicated an increase in the amount of a CPO isoform with lower mobility as seen by SDS-PAGE, suggestive of a post-translational modification. These changes in CPO size and distribution, dependent on nutrient availability, suggest a possible role for CPO in autophagy-related processes.

P-28 *The effects of low-control, high-predictability stress on spatial memory: preliminary data in a new animal model*

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Humans can experience feelings of stress even in the absence of real danger, simply by believing that there could be danger, or by anticipating what will happen in the future. This is termed “psychological” stress. We used a recently developed animal model of psychological stress to explore the roles of the stressor’s control and predictability in influencing performance in a spatial memory task (Barnes Maze). Previous studies using this model showed that rats exposed to a high-control, low predictability form of psychological stress showed memory deficits compared to controls when testing was done under normal conditions. The spatial memory deficits were specifically related to the prefrontal cortex (PFC). Therefore the memory impairment may have indicated a possible shift from the methodical, reflective control of the prefrontal cortex to more rapid, reflexive actions associated with the amygdala and other subcortical brain areas. We hypothesized that this neural shift could lead to improved spatial memory performance if the same memory task was performed under aversive conditions. Consistent with our hypothesis, the current experiment indicates that high-control, low predictability stress resulted in improved spatial memory compared to controls when the animals tested under aversive conditions.

P-29 *Expression and characterization of ECM14, a putative metallo-carboxypeptidase from Saccharomyces cerevisiae*

Matthew James Schott¹, Peter J. Lyons¹, ¹MS student in Biology, Department of Biology

Metallo-carboxypeptidases are found in most organisms and function in the digestion and maturation of proteins. ECM14 is a putative metallo-carboxypeptidase found in the yeast *Saccharomyces cerevisiae* and localized to the vacuole. There are a number of amino acids in the putative active site of ECM14 that suggest a catalytic mechanism different from the typical carboxypeptidase. In order to investigate the enzymatic mechanism of ECM14, the protein was histidine-tagged and over-expressed in *S. cerevisiae*. Western blotting of protein extracts resulted in a 40 kDa histidine-tagged protein, intermediate between the predicted sizes of the proenzyme (50 kDa) and the mature enzyme (35 kDa). Proteinase A, the endopeptidase predicted to be responsible for maturation of ECM14, was co-expressed with ECM14, but resulted in no change in ECM14 size, suggesting that the mature form may already be present. Overexpressed ECM14 protein was insoluble. To obtain soluble protein, ECM14 expression was induced at low temperature, for varying lengths of time, and at lower inducer concentrations. No change in solubility of ECM14 was observed under any of these conditions. Further experiments to obtain soluble protein will make use of an insect cell expression system and refolding from a denatured state.

Chemistry

P-30 *Isoxazolines and Thiolactones: Two Types of Heterocyclic Compounds to Investigate for Synthetic and Antibacterial Purposes*

Lisa Ahlberg, Josh Szykowski¹, Lucyna Krzywon², Rosanne Thornhill¹, Department of Chemistry and Biochemistry,
¹BS student in Biochemistry, ²BS student in Biology

Development of highly antibiotic resistant strains of infections such as staphylococcus and tuberculosis warrant the search for new antibacterial chemotherapies. With vanishing antibiotic therapies available for such infections and with little pharmaceutical company input into such problems, it is critical for many researchers to investigate novel therapies against these bacterial threats. The projects that we are working on involve the synthesis of isoxazoline and thiolactone compounds, which have shown potential for antibacterial activity. These heterocycles have interesting activity against numerous organisms that could prove useful, especially as we vary the substituents on the heterocycle to look for increases and decreases in activity against certain organisms. We have begun making compounds with the general isoxazoline moiety and a compound similar to Thiolactomycin. We are interested in the 1,3-dipolar addition reaction with questions to probe that reaction that include: What effect will changes in the substituents have on the resulting regiochemistry of the product? Can we control the regiochemistry? And can we build another antibiotic?

P-31 *Simple LIBS spectrometer for Instrumental Analysis and General Chemistry*

David W. Randall, Ryan T. Hayes, Peter A. Wong, Department of Chemistry and Biochemistry

A LIBS (Laser Induced Breakdown Spectroscopy) spectrometer constructed by the instructor is reported for use in undergraduate analytical chemistry experiments. The modular spectrometer described here is based on commonly available components including a commercial Nd:YAG laser and a compact UV-Vis spectrometer. The modular approach provides a flexible arrangement that allows the use of the components in other experimental techniques, such as Raman spectroscopy and measurement of lifetimes of excited states. Integrating LIBS into the undergraduate analytical chemistry curriculum gives students experience with this important, emerging analytical method as well as hands-on experience with this common type of laser. Finally, experiments in which the LIBS spectrometer is used in both upper- and lower-division chemistry courses as well as a use for forensic chemistry are outlined.

P-32 *Synthesis and Characterization of Aqueous Silver Nanoparticles by Silver Oxide and Acetylacetonate*

Bitna Yoon, Jean G. Charles, Getahun Merga, Department of Chemistry and Biochemistry

Metallic nanoparticles (NPs) are currently a subject of intense interest because of their attractive physical, chemical, catalytic, and spectroscopic properties. The most synthetic methods for the production of metallic silver NPs suspension utilize a silver nitrate precursor salt, a reductant and a stabilizer like citrate, to provide electrostatic suspension or steric stabilization to the particles. However, the presence of foreign adsorbates or stabilizers affects the optical characteristics of the plasmon band of the particles as well as their photochemical reactivity. Hence, our work describe the synthesis of "Stripped or Naked" nanoparticles upon reduction of Ag₂O by acetylacetonate which was finally distilled off from the particles. The reaction generates particles that contain no foreign stabilizer other than silver or water species. The particles are assigned to be stabilized by hydroxide ions. Thus, the hydrophobic metallic surface becomes hydrophilic in the absence of other stabilizers, enhancing the suspension stability. The suspensions of particles were analyzed for particle size, size distribution, residual ions, and metal-atom concentrations using conductivity, pH, ICP, and UV-Vis spectra. The synthesis products were compared with similar results from previously prepared silver particles by H₂ reduction in an analogous procedure.

P-33 *Comparison of the tissue staining of CA19-9 versus sialic acids (using Avian and Human Haemagglutinin (HA)) within microtissue array samples*

Katie Partyka, David Nowack, Brian Haab, Department of Chemistry and Biochemistry

The early detection of cancer is the primary determinant of increasing the 5-year survivability of the patient following its diagnosis. Pancreatic cancer has the lowest 5-year survivability of all common cancers. Developing early detection methods for that disease is crucial to increasing its survival rate. Changes in glycoprotein structures in the blood and serum have been detected that correlate strongly with cancer prognosis, specifically, the concentration of the carbohydrate moiety known as CA19-9. Cancer victims with high levels of CA19-9 glycoproteins circulating in their system are known to have significantly shorter prognosis. Using lectins that bind to CA19-9 and HA which binds to α 2-3 sialic acid bonds and α 2-6 sialic acid bonds in microarray tissue slides, the resulting trends in binding gave disappointing results and lowered the confidence that HA can be used as an early detection marker.

Mathematics

P-34 *Transition to Proof and Beyond: What's Needed for Success?*

Robert C. Moore¹, Milos Savic², Melissa Mills³, ¹Department of Mathematics, ²Department of Mathematics, University of Oklahoma, Norman, OK ³Department of Mathematics, Oklahoma State University, Stillwater, OK

This study explores mathematicians' views on 1) transition-to-proof courses and the 2) knowledge and skills students need in order to succeed in subsequent mathematics courses. We interviewed seven mathematicians from three U.S. universities. They agreed unanimously that a content course could be used as a transition-to-proof course under certain conditions, and they agreed on a number of topics that should be included in such courses. The mathematicians said the knowledge and skills needed for success in advanced mathematics courses include precision in thought and writing, ability to make sense of abstract concepts and use them flexibly, understanding of the nature of definitions and how to use them, ability to read and validate proofs, and skill in using proof techniques. Results from this study will be used to frame a larger study investigating students' proof processes in their subsequent mathematics content courses and investigating how these skills can be incorporated into a transition-to-proof course.

P-35 *Coexistence State of Multiple Species of Animals Residing in an Environment*

Joon H. Kang, Department of Mathematics

Two species of animals are competing in the same environment. Under what conditions do they coexist peacefully? Or under what conditions is either one of the two species become extinct, that is, either one of the two species excluded by the other? It is natural to say that they can coexist peacefully if their reproduction rates and self-limitation rates are relatively larger than those of competition rates. In other words, they can survive if they interacts strongly among themselves and weakly with others. We investigate this phenomena in the mathematical point of view by modeling of a system of Partial Differential Equations.

P-36 *An inequality on Riemannian submersion invariant and theta-slant isometric immersion*
Yun Myung Oh, Department of Mathematics

It has been known that if a Riemannian manifold admits a non-trivial Riemannian submersion with totally geodesic fibers, then it cannot be isometrically immersed in any Riemannian manifold of non-positive sectional curvature as a minimal submanifold. B.Y. Chen proved this using an inequality involving the submersion invariant and his inequality shows the upper bound of the invariant \check{A}_π if a manifold is Lagrangian submanifold. Recently, the lower bound was found and furthermore, another inequality can be derived if we consider a θ -slant submanifold in complex space forms.

Physics

P-37 *Preparing for Advanced LIGO*
Tiffany Summerscales, Department of Physics

The Initial LIGO detectors have completed their search for gravitational waves and are currently undergoing major upgrades. While no gravitational waves were measured during the initial era, the instruments were sensitive enough to make significant astronomical discoveries. Once the upgrades are complete, Advanced LIGO will begin taking data in 2015. The eventual factor of 10 improvement in sensitivity will guarantee gravitational wave detections provided that General Relativity and astrophysical models are correct. The Andrews University LIGO group has been developing a gravitational waveform recovery method. We will be working on updating and improving this analysis to ready it for the Advanced LIGO era.

Engineering and Computer Science

P-38 *Automatic summarization of clinical abstracts for evidence-based medicine*
Rodney L. Summerscales¹, Shlomo Argamon², Nandhi Prabhu Mohan³, Shangda Bai³, Jordan Hupert⁴ and Alan Schwartz⁵,
¹Department of Engineering and Computer Science, ²Department of Computer Science, Illinois Institute of Technology, Chicago, IL,
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A central concern in Evidence Based Medicine (EBM) is how to convey research results effectively to practitioners. One important idea is to summarize results by key summary statistics that describe the effectiveness (or lack thereof) of a given intervention, specifically the absolute risk reduction (ARR) and number needed to treat (NNT). Manual summarization is slow and expensive, thus, with the exponential growth of the biomedical research literature, automated solutions are needed. We have developed a novel machine learning-based software system that generates EBM-oriented summaries from research abstracts of randomized controlled trials. The system has learned to identify descriptions of the treatment groups and outcomes, as well as various associated quantities. It distills these elements into summaries that include summary statistics calculated from the reported outcome values found in the text.

P-39 *CaM and OMP interaction monitored by the QCM-D sensor*
Hyun J. Kwon, Department of Engineering and Computer Science

Olfactory marker protein (OMP, 19kDa) is a ubiquitous, cytoplasmic protein found in mature olfactory receptor neurons of all vertebrates. Calmodulin (CaM, 17kDa) is a ubiquitous Ca²⁺ sensor and has a wide range of binding partners in the olfactory sensory cascade. Although CaM has been studied extensively, however, OMP's role in olfactory neuron has been enigmatic. We tested CaM (or OMP) and various peptides in the olfactory cascade to identify its roles using the QCM-D sensor and NMR. We proved that OMP and CaM shares the same binding motif to many proteins in the olfactory sensory transduction. Moreover, OMP and CaM were observed to bind to one another in the pull-down assay and QCM-D sensor. The results suggest that OMP is deeply related to regulating CaM's function in the olfactory sensory transduction.

Nursing

P-40 *Theory to Practice: A Native-American Experience for BSN Senior Students*
Gisele Kuhn, Department of Nursing

For two consecutive years, Senior Nursing students in a BSN program were enrolled in a new nursing mission service class where they were taught about transcultural nursing service and were led by nursing faculty to a Native-American Reservation in Montana where they provided nursing service to 1,000 Native-American children. This pioneer nursing service encouraged students to improve sensitivity, cultural awareness, competence, confidence, learning and leadership skills, teamwork, time management, and health assessment skills. This qualitative study used an evaluation survey, journaling, and observations. The study had a small sample size in the first class (N=13) and a larger sample size in the second class (N=30). Senior nursing students had improved satisfaction in their learning service activities and improved their cultural sensitivity and self-confidence, which enabled them to improve critical thinking and nursing competence. The implications for nursing educational practices is that involvement in a mission service class in a Native-American reservation will students and faculty to use their nursing knowledge and skills, using principles of transcultural nursing, enabling them to improve critical thinking.

P-41 *Music Relaxation Video and Biophysical measurements: A Randomized Controlled Trial*

Grace Chi¹, Dennis Cheek², ¹Department of Nursing

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Stress is a concern of college students as they are encountered with a variety of academic, financial, and social pressures. Psychosocial stress is associated with an increased risk of coronary heart disease, which is partially related to stress-induced endothelial dysfunction. "Endothelial dysfunction" has been associated not only with hypertension or atherosclerosis, but also with physiological and pathophysiological processes including aging, smoking and stress. It was found that music might stimulate the β -endorphin to activate endothelium-derived nitric oxide in vessel dilation. Music might induce positive emotions and beneficially influence vascular health. Increasing the awareness of the impacts of stress-induced anxiety on endothelium related to the risk of cardiovascular diseases may make a difference in the lives of college students.

Physical Therapy

P-42 *The effect of hippotherapy on hypertonicity and function as measured by the HAT scale (Hypertonia Assessment Tool) Modified Ashworth scale and TUG (Timed Up and Go) test.*

E. Oakley, T. Jardine, N. Wier, T. Homnick, C. Swain, Department of Physical Therapy

Purpose: Hypertonia is an increase in the normal resting tone of the muscles resulting in rigidity and spasticity of the involved muscles making functional tasks such as walking, dressing, and activities of daily living, difficult to accomplish. Hippotherapy is the use of a horse to help with treatment goals and is used to treat hypertonia. There is currently not enough measurable evidence of its effectiveness. Research demonstrating the effectiveness of hippotherapy would establish this treatment as a viable option for the treatment of hypertonia and provide needed evidence for potential funding and resources for hippotherapy centers and its clients. The purpose of this study is to determine if hippotherapy is an effective treatment method for decreasing tone and improving gait speed in children and adolescents with hypertonia. Subjects: Thirty male or female adolescents between the ages of 4-19 years will be selected through purposive sampling. Methods: For each subject, a trained hippotherapy physical therapist will perform a baseline assessment to determine the presence of hypertonia utilizing the HAT scale. The Modified Ashworth scale will be used to quantify the degree of hypertonia present and the TUG test will be used to assess gait speed. The subject will then receive a 15-35 minute hippotherapy treatment and a post-assessment of the dependent variables will be done at 2-week intervals over an 8-week period.

P-43 *Development and validation of an educational kinesiology tutorial for entry-level DPT students*

David Village¹, Autumn Davis², Eric Moll², Ruderis Maltez², Jessica Stotz², ¹Department of Physical Therapy,

²Student in Physical Therapy

Background & Purpose: Few kinesiology educational aids for physical therapy students have been validated. The purpose of this study was to determine the validity of a newly developed kinesiology tutorial. Method Description and Evaluation: A rubric was developed to evaluate the tutorial against course objectives, APTA's Foundational Sciences Matrix, and CAPTE accreditation standards. Content experts reviewed the tutorial against the rubric and provided constructive feedback. Cronbach's alpha and ICC were used to analyze the data. Outcomes: ICC for reliability among reviewers was used, comparing all responses for a given prompt, and comparing sections of the rubric for consistency among reviewers (ICC = .954, $p < 0.001$). Cronbach's Alpha was utilized comparing similar questions of the rubric among the four reviewers for consistency (.225-.921). Descriptive statistics analyzing the means of rubric scores submitted by reviewers were also determined. Discussion and Conclusion: A validated kinesiology tutorial has potential for supplemental, engaging learning opportunities. Improved student performance when using computer-assisted learning tools can occur. A high intraclass coefficient between questions on the kinesiology tutorial developed for this study is a significant indicator of the instrument's validity. Phase Two of this study will attempt to determine the efficacy of AUPT DPT students' use of this tutorial.

P-44 *Incidence and Impact of Urinary Incontinence and Health Related Quality of Life for Postpartum Bangladeshi Women: Comparison by Birth Mode*

L. Walton, S. J. M. Ambia, A. Begum, C. Buddy, Department of Physical Therapy

Purpose: To investigate the incidence of urinary incontinence (UI) and relationship between UI and health related quality of life (HRQOL) of postpartum Bangladeshi women. Problem Statement: There are no studies comparing HRQOL with incidence and impact of UI amongst Bangladeshi women who have had cesarean section (CS) and those with normal vaginal delivery (NVD). Methods: Prospective, cross-sectional, correlational design (n=86) of postpartum Bangladeshi women, ages 18-44, with history of one or more obstetrical deliveries within the last three years. This study was implemented at the Center for Rehabilitation of the Paralyzed (CRP) in Bangladesh. Subjects completed the Bengali version of the SF-36, IIQ-7, and Health Questionnaire.

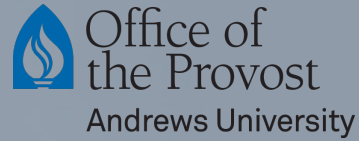
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