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Administration

Financial Literacy: What is the Responsibility of Higher-Education Institutions? Sheri Geddes and Todd Steen, Hope College

The purpose of the presentation is to examine the responsibility of higher-education institutions to provide financial education to students and families. The recent economic crisis has brought to light the lack of financial understanding and the poor financial decisions of millions of Americans. Financial illiteracy is widespread throughout the American population (Lusardi and Mitchell, 2007). Over the last two decades this vast problem has been studied from many perspectives. Although some higher-education institutions have occasionally spoken to these issues, and others have taken a leadership role in ensuring financial education for their students, many institutions have not had a great deal of influence in this area. This paper will add to the growing literature on financial education. It will include a review of courses being offered at three different samples of colleges and universities. The presentation will highlight some shortfalls of current education initiatives and explore opportunities that higher-education institutions could consider implementing. The strategies reviewed in this presentation could be relevant to educators, campus administrators, student organizations, parents, economists, government agencies, financial planners, and even churches since financial education is a national issue impacting both economic and social structure stability.

Students' Attitudes Toward the Use of Hearing Aids in the School of Al-Ahsa, Saudi Arabia. Abdullah K Alodail

The researcher used quantitative methods (survey) to gain information about students' perceptions toward the use of hearing aids in Saudi Arabia. The survey of this study was designed by the researcher to conduct to collect the data. The researcher was interested in conducting this study to determine which of the five predictors, perceived effectiveness, perceived social life, perceived denial, perceived adaptation and gender, can predict attitudes of students toward the use of hearing aids in Saudi Arabia. The main population of this study was Saudi male and female students who use hearing aids.

Who Cares About Your Stupid Goals? Brandon W. Youker, Grand Valley State University

Historically, programs are judged according to the achievement of their goals and objectives. Program funders and administrators tend to focus on what the program is proposing to do and, consequently, deem the program successful if it

does what it said it was going to do. Although goal-orientation may seem sensible, there are several weaknesses or flaws with doing so especially as the sole strategy for evaluating a program. There are a growing number of evaluators who advocate evaluation approaches that operate without attention to or regard for a program's stated goals. This presentation will discuss the problems associated with evaluating a program according goal to attainment as well as highlight many of the benefits of goal-free evaluation. Such benefits include controlling goal orientation-related biases, uncovering unanticipated side effects, avoiding the rhetoric of "true" or "real" goals, adapting to contextual/environmental changes, aligning goals with actual program activities and outcomes, and supplementing goal-based evaluation strategies. Lastly, a few case studies of goal-free evaluation will be described to provide audience members with real world practice examples.

A New Option for Stretching Retirement Plan Distributions. Debra McGilsky, Central Michigan University

The goal of most individuals is to acquire enough funds to live comfortably in retirement, to ensure those funds will be taxed as minimally as possible, and ultimately to not outlive those funds. The Treasury Department and IRS recently authorized a new option to help with these concerns, Qualified Longevity Annuity Contracts (QLACs). This new option is effective for certain annuity contracts purchased after July 1, 2014. QLACs differ from other longevity annuities in that they can be used within a 401(k) or 403(b) plan, and they allow distributions to be deferred past the required minimum distribution age of 70½. This paper discusses the specific requirements of QLACs and identifies who might benefit from owning one. The paper illustrates how QLACs can lessen the taxes paid on required minimum distributions from the owner's retirement plan(s). It also discusses tax implications for the beneficiaries of QLACs. In addition to individuals, financial planning professionals as well as tax professionals need to understand the specific rules related to the new QLACs to ensure they are providing proper and up-to-date planning advice to their clients.

Audit Committees in Michigan Public Universities. Philip Kintzele and Vernon Kwiatkowski, Central Michigan University

Audit committees of the board of directors have had increasing responsibilities for the effective governance of public corporations for many years. A fraud hot line, sometimes called a whistle blowing function, has recently been in the news more. Audit committees of the boards of trustees of public universities can assist in the effective governance of public universities. This project reviews the roles of audit committees and examines the 15 Michigan public universities to identify the function of their audit committees. The current practices and operations of the audit committees of Michigan public universities will be compared to the best practices recommended for public corporations.

An Assessment of Challenges and Barriers for Women in STEM in the Academy: A Case Study. Xiaohui Zhong, Linda Slowik, Dawn Archey, Pamela Zarkowski, Kathleen Zimmerman-Oster, and Ryan Todoroff, University of Detroit Mercy

Campus climate plays a critical role in faculty work experiences. As part of a National Science Foundation (NSF) grant awarded to the University of Detroit Mercy (UDM), an institutional self-assessment was initiated to explore and identify issues impeding the recruitment, retention and promotion of female faculty in the STEM disciplines. Such information will be used as the foundation for creating an action plan to transform the climate at UDM. In the first stage of this project, a survey was distributed university-wide to full-time faculty, resulting in a response rate of 38%. Preliminary results for the full sample indicate the campus climate is generally positive, as they report generally beneficial levels of perceived organizational support, communication, empowerment, and conflict. Health and well-being also tend to be generally good, with somewhat high levels of commitment, job satisfaction, health, and citizenship behaviors, as well as low levels of isolation, and stress. Additional results relating to differences across gender and STEM and non-STEM will be presented at the conference. In addition, narrative description will be provided of an innovative program, NetWalking. This is an informal activity for faculty members to “walk and talk” with the potential for improved health, mental focus, and networking.

Academic Herding, Accepted Truths and Nobel Prizes. Glenn Pettengill, Grand Valley State University

This paper provides a light-hearted, but critical, view of the tendency for group think within a particular academic discipline by a soon to retire professor. Although the paper focuses on the discipline of finance, the author presumes that the tendency for enshrinement of “academic truths” is general to most if not all disciplines. The paper focuses on three widely accepted principles in the field of finance. Special emphasis is given to the principle of the efficient market hypothesis (EMH) and associated model building. Examination is also given to risk of a long option position, the Modigliani-Miller capital structure analysis and to the dividend discount model. In all cases it is argued that commonly accepted principles provide inaccurate representation of market realities and potentially dangerous implications for market behavior.

Cyber Risk Disclosure in the Automobile Industry: Is It Sufficient? Steven A. Harrast, Central Michigan University

Recent SEC disclosure guidance recommends greater transparency with regard to cyber risks. In general, companies are required to disclose material risks to investors in 10-K filings. Because cyber risks are a growing threat to publicly-traded companies, 10-K disclosure has been increasing. The automobile industry

is seeing increased cyber risks as information technology becomes both a business process and a product. Current production automobiles communicate with networks (GM OnStar), with mobile devices (Bluetooth), and with other vehicles on the network. Computer sensors and algorithms are the new frontier in vehicle safety. As computer technology becomes more integrated into automobiles, we examine the cyber risk disclosures to determine their sufficiency. We find that, in spite of growing cyber risks, most automobile companies are avoiding cyber risk disclosures.

Is “Analytics” the Answer to Improving the Utilization of Company Data Stored? Gary Hayes, Central Michigan University

Managers understand the value of “Big Data” for assisting in making better decisions. What is “Big Data”? It is a title (description) for the large increases in the volume, variety, and velocity of data that has occurred because of ERP type software being implemented by more and more companies today. As companies face stiffer competition worldwide with profits at stake, using business analytics effectively becomes critical in forecasting and predicting future outcomes. Analytics is used to gain insight, foresight, and inference from the vast amount of transactional data, both internal and external, that many companies store in a digital format. Executives are no longer content with making decisions based only on intuition and instinct but want data and facts to support courses of action they can take for the company. So business analytics takes statistics to a higher level, by simplifying the data. It does this by converting large volumes of data into much smaller amounts of information in a way that can provide valuable insight. In a sense, it provides new information and helps encourage more insightful questions. Analytical software does this at a fairly reasonable cost, so even smaller companies can leverage analytics to compete with the big boys.

Speaking Publicly: Fresh Approaches to Giving Professional Presentations. Anthony Burdick, Aquinas College

As the instructor for the Accounting capstone and communication courses at Aquinas College, much of my work centers on coaching students in giving effective presentations. This coaching is often based on my experience as a professionally trained actor; I studied Drama at the University of Michigan and Acting at American Conservatory Theater. In the article, I apply insights I’ve gained as a performer to giving professional business and accounting presentations.

Much good advice is available on public speaking, e.g., have good posture, maintain eye contact, don’t read off the screen. Unfortunately, putting these recommendations into practice doesn’t necessarily lead to giving successful presentations. None of them gets to the heart of the matter—the fundamental reason the presenter is presenting. In the article, I discuss processes actors use to

discover their characters' "superobjectives" and similar processes by which speakers can powerfully connect with why they are sharing; these can help provide the drive to present memorably.

It is also important for speakers to remain aware of the substantial detailed feedback audiences are giving them—the nonverbal communication—and to make appropriate modifications in their delivery. In fact, in the article I advocate viewing presentations as dialogues between presenter and audience.

An Analysis of the Impact of Taking College Courses during High School Years on Academic Success and Persistence at Andrews University. Glynis Bradfield, Andrews University

This study explores data on students admitted to Andrews University undergraduate programs in 2010–2013, who had taken one or more college-level courses during their high school years. While purported benefits of early college and dual enrollment have included better transition to college, increased academic engagement, and degree completion, research findings are limited. In order to best advise high school students enrolling in Andrews University courses, the relationship between the number of college courses taken during high school, SAT scores, high school GPA, first and second year university GPA, course delivery mode, courses taken prior to admission and program choice, and persistence in second year studies, are examined. The MASAL presentation will report findings on the impact of enrolling in college courses during high school on Andrews University undergraduate student academic success and persistence. While implications to admissions standards, recruiting and marketing, orientation and academic advising, and partnerships with high schools will be considered within the context of this university's experience, it is hoped that findings will contribute to further research on dual enrollment.

Anthropology

Addressing Questions of Seasonality Using Ancient DNA to Determine Genetic Diversity in Precontact Dog Populations at Dionisio Point. Lori Radwin and Jodi Lynn Barta, Madonna University

Dogs are considered a co-domesticated species and as such can be considered as proxies in ancient DNA (aDNA) studies where human remains are not available or cannot be used for destructive analysis. Ancient canid skeletal remains excavated from the Dionisio Point (DgRv-3) archaeological site on Galiano Island, British Columbia, Canada provided a sample collection suitable for DNA analysis. Ancient DNA was extracted, amplified, visualized, and sequenced from canid skeletal fragments. Data were used to identify single nucleotide polymorphisms (SNPs) in the genetic sequence and to determine

individualizing haplotypes for each sample. Haplotype variation can be used as an indicator of genetic diversity within a population and associated with human activities at a specific habitation site. A 28% amplification success rate was achieved, which resulted in a diversity rate of 71.4%. Data showing the presence of many haplotypes within the small sample suggest the site was populated by diverse groups of people during a season of high resource availability. A spring-summer site determination may be most in keeping with this high level of genetic diversity.

A Hairy Situation: Determining Ancestral Diversity in the Spring Street Cemetery Using Ancient DNA. Amanda Forde and Jodi Lynn Barta, Madonna University

On December 11, 2006, construction crews working on the Trump SoHo Towers in New York City broke through the burial vaults of the historic Spring Street Presbyterian Church. Skeletal remains along with human hair were recovered from the church's four vaults, which were in use from 1820 until 1846. The history of the church reveals an abolitionist congregation led by pastors Samuel H. Cox and Henry G. Ludlow, who openly allowed African-Americans into the congregation. Segregated seating was implemented by law during this time, provoking the question of whether these burial vaults were also segregated. Church records are sparse and give no indication of whether African-Americans were buried in the same vaults as other congregants. This study focuses on determining ancestry of these individuals using ancient mitochondrial DNA analysis of the hair. DNA was extracted from 15 hair samples and the first hypervariable region was amplified, sequenced, and analyzed. Results show that DNA was preserved in the hair shafts, and tentative haplotypes of H2a2a, D1h2, and H5 were identified. To date, there is no evidence to show that African-Americans were buried in the Spring Street burial vaults. However, the presence of a potential Native American indicates that individuals of diverse ancestry were buried together.

Abolitionist Rhetoric or Racial Equality?: Discovering the Ancestry of the Spring Street Presbyterian Church Cemetery Population Using Ancient DNA. Stephanie Gladysck, Syracuse University/Madonna University; Jodi Lynna Barta, Madonna University

During the winter of 2006, where New York City's SoHo Towers now stand, construction crews uncovered four underground burial vaults. The vaults were determined to belong to the historic Spring Street Presbyterian Church cemetery and subsequent excavation yielded the remains of over 200 individuals. Spring Street Presbyterian Church was a well-known abolitionist congregation from the early to mid-nineteenth century. The church's pastors accepted anyone into the congregation without discrimination, including African Americans, and preached in support of racial equality in society. Limited records do not reflect interment of

African American parishioners in any of the church's cemetery vaults, and common practices at the time would lead to the belief that they were buried in segregated plots, which leaves questions about who was actually buried within the Spring Street vaults. This research focuses on the whole genomic extraction, polymerase chain reaction amplification, sequencing, and analysis of ancient mitochondrial DNA from the skeletal remains of 13 individuals in order to determine the maternal ancestry of members of this population. Results of these analyses reveal that a diverse group of individuals found their final resting place in these burial vaults.

Only the River Remains: The Memorialization of the *Eastland* Disaster, 1915–2014. Caitlyn Perry Dial, Western Michigan University

On July 24, 1915, the boat *Eastland* capsized in the Chicago River after boarding 2,500 passengers for a day excursion to Michigan City. To this date, the 844 souls lost in the river that day is the greatest loss of life on the Great Lakes. However, when asked, the average person has no knowledge of the event. If it is not the loss of lives that makes a tragic event like the *Eastland* Disaster memorable, what is it? This presentation will discuss how the disaster has been remembered in the nearly 100 years since the event. It will also discuss how in recent years an effort has been made to reestablish the *Eastland* Disaster in Chicago's public memory by two historical organizations dedicated to *Eastland's* memory. This study claims that private, personal memories carried through generations of storytelling by the event's survivors have the ability to establish the now emerging public narrative of the event.

Rock-Cut Chambers on Mt. Raitano, Sicily: Mt. Raitano Survey and Excavation, May, 2014. Justin Singleton, Andrews University

The ceilings of at least six badly eroded chambers can be seen on the eroded cliff face of a sandstone outcrop on the north side of the mount. Excavation of these grotticella was of course, impossible and the date is uncertain, but may be Bronze Age. Our survey located openings into three additional rock-cut chambers at the base of the same sandstone outcrop in which the six grotticella were located. These were hidden under thick outgrowth of vegetation that served as markers for the chambers (other chambers may be located under thick undergrowth nearby). Seven more rock cut chambers are located upslope on the south side of the mountain. Two of these seven are rectangular in shape and have side opening in the east facing cliff. The other five are larger, beehive in shape with openings at their tops (two can be entered from a side entrance in the south facing cliff—this side entrance may have been cut later. While these seven chambers have been known to scholars for some time, only two have been investigated. Our excavation and survey included all of these chambers.

African-American Male Development in the Nation of Islam. Robert A. Bailey, Andrews University

It is an irrefutable fact that American society has failed the African-American male. The Nation of Islam, on the other hand, has a long history of reforming African-American males involved in the United States penal system. But what preventative measures do they take? Is there a replicable African-American male development template that has originated in the African-American community? What is the Nation of Islam and what approach does it take in developing its African-American males? To answer this question I conducted a mini-ethnography to better understand the methods and motivations of the Nation of Islam. I attended services and events in addition to interviewing key members of the Nation of Islam. While this study is exploratory in nature, I hypothesized that Nation of Islam does have a replicable African-American male development template. The research revealed a program, the Fruit of Islam, which addresses the physical, academic, spiritual and social needs and responsibilities of the African-American male. The Nation of Islam undoubtedly has a program worth imitating and contextualizing.

The Osteology of Poverty in Detroit: Forensic Anthropology Case Reports from 2015. Megan K. Moore, Eastern Michigan University

The economic decline of Detroit has had many repercussions on the health of its citizens. The forensic anthropological analysis of human skeletal remains gives a rare and intimate perspective of the dire consequences of poverty on the skeleton. This study explores five forensic anthropology cases analyzed during 2015 at the Wayne County Medical Examiner's Office. These unidentified cases emphasize the lack of resources afforded these individuals and the great physical costs of poverty. All five of these individuals exhibit extensive, severe osteoarthritis in many joints of the body. One case exhibits severe osteoporosis resulting in deformation of the skull and thorax. Each of these individuals died homeless and alone, inevitably suffering from chronic pain. Their unidentified remains may never be identified, as the next of kin may not have reported these individuals missing. Their remains will likely be interred in pauper graves with little recognition of the hard physical labor and sacrifices that each one made during their difficult and impoverished lives. The excruciating pain and suffering that they endured can at least be reported here to demonstrate through the osteology of poverty, that life was anything but easy for these individuals.

An iPad-Based Ethnobotanical Interview Method in the Ecuadorian Amazon. Caroline Asiala and Brian Doyle, Alma College

As part of an effort to document the traditional medicine in San José de Payamino, a Kichwa-speaking indigenous community in Amazonian Ecuador, a novel iPad-based method was employed to efficiently interview community

members. Thirty-eight individuals (19 men and 19 women) were interviewed using an iPad to show participants photographs of 36 plants that had been indicated by various community members during forest-walks in previous years. Interviews took approximately 1 hour as participants were shown each photograph and asked questions, including the name, indication, preparation and dosage. Medicinal uses were split into 10 categories, and mentions from each category were summed. Overall, the most commonly mentioned category was aches and pains, followed by injuries. A modified fidelity level (FL) to measure agreement on medicinal use and use value (UV), a measure of relative importance in the community, were calculated for each plant. The following plants had the highest FL values: *Piper macrotrichum*, *Heliconia* sp., and *Tradescantia zanoniana*. Plants with the highest UV were: *Urera baccifera*, *Brunfelsia grandiflora*, and *T. zanoniana*. A third value, combining FL and UV, was calculated to measure both concepts. The plants with the highest combined values were *T. zanoniana*, *U. baccifera*, and *Monolena primulaeflora*.

Biochemistry & Molecular Biology

Carboxypeptidase Folding Mechanisms in the Absence of a Chaperone-Like Prodomain. Gifty B. Barfi, Hazel O. Ezeribe, and Peter J. Lyons, Andrews University

Protein folding is a complex process that often requires help from chaperones. Carboxypeptidases are proteases thought to fold with the help of intramolecular chaperones, secondary domains (often prodomains) that exist in addition to the catalytic domain. Carboxypeptidase O (CPO) is an exception. It is composed of a catalytic domain with very short terminal extensions; the C-terminal extension is a signal peptide necessary for membrane attachment via a GPI anchor. To investigate the role of these short segments and the GPI anchor in folding, site-directed mutagenesis was performed. Mutants lacking the N-terminal segment ($\Delta 24-41$), C-terminal GPI signal ($\Delta 350-374$), and predicted GPI anchor attachment site (D352A/S353A), were expressed in HEK293T cells. Upon separation of detergent- and water-soluble proteins with Triton X-114, wild-type, $\Delta 24-41$, and D352A/S353A proteins were detergent-soluble, whereas $\Delta 350-374$ CPO was not, indicating a lack of GPI-anchoring. The $\Delta 350-374$ mutant was also weakly expressed—others were detected by western blot at similar levels as wild-type CPO. To investigate a possible folding defect, CPO mutants were expressed in Sf9 cells and purified by affinity chromatography. Studies investigating the secondary and tertiary structure of these mutants are ongoing. Results thus far suggest the GPI signal peptide plays a role as an intramolecular chaperone.

Analysis of Short Interspersed DNA Elements in *Peromyscus*. Nathan C. Kilian, Karley Mahalak, and David Kass, Eastern Michigan University

Up to millions of retrotransposons are present in all mammalian genomes contributing to large proportions of genomes. Short interspersed DNA elements (SINEs) are a type of retrotransposon. ID, B1 and B2 represent examples of SINE families in rodents. Amplification of SINEs in rodent genomes essentially provides a molecular fossil record as integrations are stable and provide homoplasy-free markers, hence shared integrations between species would have occurred within a common ancestor. Utilizing DNA sequence data from the ongoing *Peromyscus maniculatus* (deer mouse) genome project we are re-evaluating the recent revisions to the phylogenetic relationships of various *Peromyscus* species. By preferentially selecting sequences matching or nearly matching the consensus sequence of these SINE families, we are biasing our study to more recently integrated elements. In addition to the potential of reconstructing or verifying phylogenetic relationships of *Peromyscus* species, our findings thus far support very recent activity of these elements. Therefore, our data support SINEs continue to contribute to the dynamics of mammalian genomes and may be associated with the highly diverse number of *Peromyscus* species.

Evolutionary Analysis of Rodent mysTR Endogenous Retrovirus.

Alexandra Hofmann, Eastern Michigan University

An endogenous retrovirus is a genetic element presumably originally derived from a retroviral infection that generates new copies in the genome (without being infectious) and these copies are passed on to future generations. I am studying the presence and evolutionary history of a particular active endogenous retrovirus (ERV) in rodents, the mysTR element or the mouse transposable element. It is highly active only in a group of South American rodents within the Cridetidae family. I plan to analyze the expansion of mysTR within this part of the rodent phylogeny in detail, and trace its ancestry to determine its successful amplification in some rodent groups and not in others.

The Origin of Mys: A Retrotransposon Found among Species of the *Peromyscus* Genus. Ashlee Smith, Kamal Abuarquob, Sarah Killian, and David Kass, Eastern Michigan University

Mys is a rodent retrotransposon, a transposable element (TE) that generates new copies in the genome via an RNA intermediate. TE sequences comprise over 40% of the human genome, with some maintaining the ability to integrate into new genomic sites resulting in diseases such as breast cancer, hemophilia and neurofibromatosis. In contrast to other mammalian retrotransposons, mys appears to have been derived fairly recently. We hypothesize that mys originated more recently than previously reported. A retrotransposon limited to a small taxonomic group of mammals provides a unique opportunity to gain insights into the origins and evolution of this type of mobile DNA element. Notably mys appears to have become highly active within a small clade of *Peromyscus* species. Our findings suggest that mys originated in the genus *Peromyscus*, and hypothesize its

derivation from the newly identified mysRS element in the Reithrodontomini tribe of rodents. Although the mysTR element dates back further, having been identified in all analyzed cricetid rodents, it is markedly distinct from mys. We are continuing to isolate clones from intra-mys libraries and analyzing sequence data, along with further quantitation analyses to address this hypothesis.

The Role of Epigenetics in the Evolution of Species of European House Mice. David H. Kass and Jumanah Saedeh, Eastern Michigan University; Mikaylah Heffernan, Henry Ford College; Polly Campbell, Oklahoma State University; Michael Nachman, University of California Berkeley; Priscilla Tucker, University of Michigan

Epigenetics involves heritable changes in gene expression without alterations in DNA sequence. Variations in DNA methylation represent a primary epigenetic mechanism. Random X-inactivation and monoallelic expression due to parent-of-origin imprinting represent naturally occurring epigenetic events. Epigenetic changes may be influenced by environmental factors leading to differences among populations thereby potentially contributing barriers resulting in reproductive isolation and the formation of new species. Loss of imprinting (LOI) has been observed in hybrids of closely related species and associated with various morphological abnormalities. In this investigation, we utilized a methylation-sensitive representational difference analysis (MSRDA) to provide a random, genome-wide approach to isolate aberrant epigenetic changes within the genomes of hybrid embryo and placental tissues of *Mus musculus musculus* and *M. m. domesticus* subspecies. Specific clones of the MSRDA libraries have been isolated to confirm demethylated DNA sites of hybrids in relation to the separate subspecies, and to identify the aberrant genomic regions and/or genes potentially associated with reproductive isolation. The results will provide information to help elucidate the role of epigenetics in mammalian evolution.

Effects of Eicosapentaenoic Acid on the Growth of Wild Type and Inositol Mutant Yeast. Yudy A. Guzman and Marlene Murray, Andrews University

Bipolar disorder is a severe mental illness that affects about 2% of the population. Treatment includes the drugs lithium and valproate, both of which are known to decrease cellular inositol levels. However these drugs are not always effective. The purpose of our research was to determine whether omega-3 fatty acids have the same effect on cellular inositol levels and cell growth as the anti-bipolar drug valproate. To accomplish this the effects of eicosapentaenoic acid on the growth of wild type and inositol over producing yeast was determined. We concluded that unlike valproate, eicosapentaenoic acid does not inhibit cell growth, however the effects of EPA on the inositol pathway were inconclusive.

Fluorogenic Enhancement of Latent Blood Impressions. Christine Sires and Wilson Muse, Madonna University

Our ongoing research involves the fluorogenic enhancement of latent blood and proteinaceous body secretions left at crime scenes. To this end, we have explored the mechanism of action of the Zar-Pro™ bloody impression lifting strip to understand and improve its functionality. Blood is normally not fluorescent. We have discovered that the post-lift fluorescence gained by the blood in the lifted impressions is due to multiple mechanisms. The primary mechanism is the catalyzation of the non-fluorescent blood fixative into a fluorescent compound. The catalyst is present in the cytoplasm of red blood cells and does not appear to be enzymatic in nature. The catalytic activity fractionates separately from hemoglobin and survives boiling, time, extremes of pH and a wide variety of solvent polarities. A secondary mechanism is due to the interaction of detergents, nonionic surfactants along with certain nonpolar solvents and blood that leads to a partitioning of a fluorescent molecule normally quenched in the blood. We believe this molecule is likely a porphyrin breakdown product of hemoglobin and is independent of the iron found in the heme.

Spectroscopic, Calorimetric, and Kinetic Analyses of Scopoletin Binding to a Phenol Sulfotransferase. Aaron Colamarino and Joe D. Beckmann, Alma College

The bovine phenol sulfotransferase (bSULT1A1) catalyzes the sulfuryl group transfer from 3'-phosphoadenosine-5'-phosphosulfate (PAPS) to the hydroxyl oxygen of aromatic acceptor substrates. The ternary complex of bSULT1A1, PAP and 7-hydroxycoumarin exhibits resonance energy transfer from the protein to the bound phenolic ligand; however, spectral overlaps complicated the analyses of binding. Therefore, we evaluated other (di)hydroxycoumarins as potential ligands. Scopoletin (6-methylscouletin) formed a very fluorescent and distinct (440 nm) PAP-dependent complex with bSULT1A1. Titrations of scopoletin into SULT:PAP provided $K_d = 0.435 \mu\text{M}$ at pH 7.4, the optimum suggested by reversible pH titrations. Binding of scopoletin to SULT was also investigated by isothermal titration calorimetry (ITC). Titrations of scopoletin into SULT alone suggested no binding of the ligand. In contrast, titration of scopoletin into the SULT+PAP complex provided $K_d = 0.255 \mu\text{M}$, $\Delta H = -29.9 \text{ kcal/mol}$, and $\Delta S = -70.2 \text{ cal/mol}\cdot\text{K}$. Finally, the ability of bSULT1A1 to sulfate scopoletin was studied under steady state conditions by recording fluorescence progress curves. With excess PAPS present, the apparent $K_m = 0.08 \mu\text{M}$ and $k_{cat} = 0.103/\text{min}$. Further kinetics experiments are in progress that may explain the disparity between the affinity estimates.

Chemical Modulators of Migration in Retinal Pigment Epithelial Cells. Eric Spilker, Paul Fox, and Frank Miskevich, University of Michigan-Flint

Retinal pigment epithelial cells (RPE) are the pigmented cells behind the neural retina and play a key supportive role to photoreceptor cells. Lack of appropriate RPE contacts can lead to macular degeneration, a common cause of

blindness. A better understanding of RPE adhesion and motility will be useful in developing possible treatments for this disease. We have examined the migratory properties of the human ARPE-19 cell line using a scratch assay and measured migration rates at 24 and 48 hours after wounding. Modulation of protein kinase A using pharmacological agents had a significant effect on the migration rate at both 24 and 48 hours. Inhibition of extracellular calcium using the calcium chelator EGTA also reduced the migration of these cells. In order to determine if cilia might be involved in this process, cells were treated with lithium chloride to alter cilia growth. SEM data showed a substantial increase in cilia length after 18 hours, and migration rates were substantially slowed at both 24 and 48 hours. These results suggest that cilia, calcium, and the PKA signaling pathway may regulate the migration of RPE cells.

Gene Expression and Invasive Properties in Breast Cancer Cells under Stress Conditions. Alam Singh, Alex Carnacchi, Kayla Conner, Dale R. Flanagan II, Kara Laird, and Felix Sab, University of Michigan-Flint

Cancer is defined by two major criteria: uncontrolled cell proliferation and metastasis. Uncontrolled cell proliferation has been researched extensively and the mechanisms associated with it are fairly well understood. In contrast, the underlying causes of metastasis remain poorly understood, even though metastasis is the main cause of cancer-related deaths. We have hypothesized that metastasis is triggered by stressful conditions within the tumor; essentially, metastatic cells may be trying to escape from an inhospitable environment. To test this hypothesis, we placed MCF7 and MB468 breast cancer cells under various stress conditions and measured the expression of proprotein convertases (PCs) and matrix metalloproteinase (MMPs) using Western Blot analysis. The stress conditions included hypoxia, heat, and combination of both stresses. PCs are enzymes that regulate catalytic activity of MMPs. Furin (an activator of MMPs) was found to have increased expression under these stress conditions, while PACE4 (an inhibitor of MMP9) decreased in expression. We also conducted invasion assays to examine if the stress conditions impacted invasive properties of the cells. The cells showed enhanced migration in most stress conditions. This research could enhance our understanding of metastatic cell behavior and lead to new therapeutic possibilities for cancer.

Understanding the Functional Significance of FAM190A Deletion Mutation. Amanda McKeith and Eric Calhoun, Alma College

Various in-frame deletions of the C-terminal domain in FAM190A (CCSER1) have been reported in 40% of unselected tumors. Immunofluorescence staining has since demonstrated that FAM190A localized to the midbody during cytokinesis. These studies, however failed to show any function difference between full-length FAM190A protein and two naturally occurring exon 6 deletion mutants when looking at midbody localization during cytokinesis. As

such, the functional consequence of the targeted deletion of FAM190A exons 7–10 during tumorigenesis remains ambiguous. The aim of our study was to generate an *in vitro* model that would allow us to examine the effect of a C-terminal deletion on cellular division and FAM190A's ability to bind to proteins known to associate with the spindle and/or midbody structures (e.g., EXOC1 and Ndel1). To accomplish this, full length FAM190A and a deletion mutant construct lacking exons 8–11 were separately cloned into the mammalian expression vector, pFN28A, which includes a N-terminal HaloTag Fusion marker. Current studies are focused on introducing these constructs into the pancreatic cancer cell line, PL-5, to generate FAM190A stably expressing cell lines.

How Compressibility Influences the Mechanical Bidomain Model.

Kharananda Sharma and Bradley J. Roth, Oakland University

Mechanotransduction is the process by which a tissue responds to mechanical signals. Important physiological events—such as remodeling of cardiac tissue around an ischemic region in the heart or the response of a vessel to shear forces caused by blood flow—depend crucially on mechanotransduction. Existing mathematical models predict stresses and strains in the elastic tissue, but do not account for the causes of mechanotransduction. In a new model, the mechanical bidomain model, the intracellular and extracellular spaces are coupled by integrin proteins in the cell membrane. The displacements of these two spaces are analyzed individually, and the difference of these displacements produces the membrane force that causes integrins to respond. Previous analyses of the mechanical bidomain model have assumed the tissue is incompressible. In this study, a compressible tissue is examined. Two length constants arise naturally from the model; one contains the shear moduli and the other the bulk moduli. The length constant containing the bulk moduli arises because the tissue is compressible. Accounting for compressibility has its largest impact on the intracellular and extracellular pressures. The bidomain contribution to the pressure obeys the Helmholtz equation rather than Laplace's equation. This model makes testable predictions with implications for mechanotransduction.

The Recovery of DNA Evidence from Zar-Pro™ Fluorescent Blood Lifters.

Alexander Hulscher and Jodi Lynn Barta, Madonna University

Zar-Pro™ Fluorescent Blood Lifters are used for the enhancement of bloody impression evidence at crime scenes. Previously, it had not been determined whether DNA evidence is preserved in the bloody impression fixed on the lifter, and if that DNA is subject to degradation over time. In addition, it was important to determine whether enough DNA evidence for profiling can be recovered from a small portion of the lifter so that the integrity of the impression itself and its evidentiary value is maintained. To explore these possibilities, bloody impressions were deposited on glass slides and lifted using Zar-Pro™ Fluorescent Blood Lifters. DNA extraction was performed on a small piece of the lifter that was cut

from an area of the impression with little detail. This was repeated across three time intervals to assess potential degradation over time. To reduce the possibility of human contamination, pGLO plasmid DNA was used as the template for extraction and amplification. This study determined that DNA can be extracted from Zar-Pro™ Fluorescent Blood Lifters and subsequently amplified, but further research is needed to assess the reliability of extraction and amplification protocols before this method can be implemented for DNA evidence recovery.

Preliminary Study of the Effect of PAMAM Dendrimers on Mushroom Tyrosinase Activity. Andrew Hong, Ryan Hayes, and D. David Nowack, Andrews University

Traditional polymer chemistry has focused widely on the use of linear polymers; however, the unique properties of highly branched polymers, called dendrimers, exhibit different functional uses as opposed to their linear counterparts. A well characterized enzyme, mushroom tyrosinase, was chosen to investigate the biological function changes, if any, caused by dendrimers. Our study measured the kinetics parameters (K_M and V_{max}) of mushroom tyrosinase, then observed those parameters in the presence of PAMAMs (polyamidodiamines) dendrimers. Tyrosinase assays showed distinct inhibition of K_M and V_{max} as the concentration of the dendrimer (PAMAM G1) increased from 0.2 mM to 5 mM. From the analysis of the Lineweaver-Burk plots, the dendrimer had a mixed inhibitory effect on the enzyme, in which it is binding to the enzyme and to the enzyme-substrate complex to inhibit both species simultaneously. Mushroom tyrosinase and dendrimer interactions can be extensively studied as models for other enzymes and allow for further study of the biological applications of dendrimers.

The Recovery of Bloody Impressions from Human Skin. Nathan Jones and Jessica Zarate, Madonna University

The recovery of bloody impression evidence from human skin can provide valuable information in criminal investigations. These preliminary findings demonstrate that Zar-Pro™ Fluorescent Blood Lifting Strips can be used to effectively recover bloody impressions from human skin after five days, in part due to the fluorogenic capabilities of the product. Research involving the recovery of bloody impressions from living human subjects continues in order to further define the parameters of recovery and increase the understanding of multiple variables involved in the recovery process.

Primer Design for Detecting Single Nucleotide Polymorphisms within the Oxytocin Receptor Gene (OXTR) among Persons with Alzheimer Disease. Katelyn Webster, Jessica Hulteen, and Emilie Dykstra Goris, Hope College

Apathy, defined as a disorder of motivation with deficits in behavioral, emotional, and cognitive domains, is a prevalent behavioral symptom among

persons with Alzheimer Disease (AD). Various complications have been associated with apathy, such as physical deconditioning, uncooperativeness with care, and social isolation. Little is known about the characteristics of persons with AD, including biologic factors, that contribute to the presence and/or severity of apathy. Variations in the Oxytocin Receptor Gene (OXTR) are hypothesized to be candidate modifiers of apathy severity in persons with AD. The aims of this study were to design and successfully utilize primers and polymerase chain reaction (PCR) in order to amplify OXTR single nucleotide polymorphisms (SNPs) as a means to examine variations within OXTR that may be associated with apathy in persons with AD. Primers were designed to amplify four SNPs (rs53576, rs237885, rs2254298, and rs237887) within OXTR and were tested using ten human lab control DNA samples. Results indicate successful DNA extraction, primer design, and amplification of all four SNPs. Study findings may contribute to a risk profile for identifying individuals with AD most at risk for apathy based on OXTR genotype, with a long-term goal to design targeted nursing interventions to benefit these individuals.

Identification of Biomarkers and Analytical Methods for Early Detection of Preeclampsia: A Meta-Analysis of Relevant Studies. Fairlyn Ditta, John Robertson, Timothy Tampubolon, and Daniel Gonzalez, Andrews University

Preeclampsia is defined as a disorder of pregnancy characterized by high blood pressure, increased amounts of protein in the urine, and edema. It is thought to involve a multiplicity of factors. One of the more significant factors is abnormal development and implantation of the placenta, and thus affects the fetal-maternal blood and nutrient flow. Because preeclampsia complex pathophysiology, a meta-analysis study was done to identify the most promising biomarkers to point out preeclampsia, focusing in early detection. The information from this meta-analysis will be used in future research to study preventive and non-invasive treatment, like physical therapy, and prevent patients from advancing into more severe stages of preeclampsia. This meta-analysis concluded that a combined approach using placental growth factor, Human Chorionic Gonadotropin, and Insulin Like Growth Factor 1 can be used for early identification of Preeclampsia. Immunochemistry assays with already available antibodies can be used to analyze these substances in maternal urine and serum samples, giving critical information for the early detection and prevention of complications during pregnancies.

Riboflavin Binding Protein, Vitamin Transport and Mutant Species as Lab and Outreach Educational Tools. Marilee Ann Benore, Michael Saruna, Amit Bhandari, and Sheila R. Smith, University of Michigan-Dearborn

Riboflavin Binding Protein (RBP) is a stable glycoprophosphoprotein abundant in the eggs of many oviparous species, including chickens. The function of the protein is to transfer riboflavin (Rf) to the developing embryo. Because of its bright yellow color and fluorescence, Rf transport serves as an excellent model

system. A natural mutant strain of white leghorn chickens is unable to synthesize RBP and thus the eggs are devoid of Riboflavin. We are currently investigating the protein and egg use in an undergraduate biochemistry lab as well as an outreach project for K-12 students.

The undergraduate research-style experiment for advanced biochemistry lab students is a useful exercise in learning protein purification techniques, including dialysis, salt precipitation and chromatography. Because of the yellow color, it is easy to follow, and its stability renders it possible to carry out steps over time at room temperature. We have modified a standard procedure and students have successfully purified protein.

Using the mutant and regular chicken eggs we have modified an education series as an informative and didactic approach towards problem-based learning. Our main motive was to perform outreach to K-12 with an interactive experiment featuring the importance of vitamins and the mechanisms of molecular transport.

Botany & Plant Ecology

Native Habitats in Urban Landscapes: Prince Prairie on Calvin's Campus.
Deanna Geelhoed, Kara Smit, and Dave Warners, Calvin College

Increased human development has led to a loss of native landscapes and native biodiversity. In urban areas this loss can be abated with the establishment of green spaces that include native plants and trees. Incorporating local flora into urban landscapes can bring many benefits, including decreased use of fossil fuels and pesticides, restoration of wildlife habitat, storm water and erosion control, genetic diversity enhancement, and pollination attraction. This study's aim was to evaluate different approaches of installing prairie habitat in an urban area. In 2013, the first installment of Prince Prairie was planted on Calvin College's campus, with replicated quadrats of five species (Plains Oval Sedge, Sand Coreopsis, Pasture Rose, Northern Blazing Star, and Little Bluestem) in six soil treatments. These treatments consisted of combinations of rototilled or non-rototilled ground and sand:organic soil compositions. Our 2014 data show that while all species grew best in the sandiest soil, some preferred rototilled plots, while others grew better in non-rototilled soil. We found no correlation between weed mass and soil composition, rototilling, or the plot's position. Ongoing research will see if first year results remain consistent in subsequent years. Furthermore, as the prairie is expanded additional studies will be added.

Patterns in Community Structure of Lower-Trunk Epiphytic Communities in a Mid-Elevation Rainforest in Puerto Rico. Melinda A. Rose-Eadie and Gary Greer, Grand Valley State University

We describe the structure of epiphytic communities (EC) of a mid-elevation rainforest in Puerto Rico. EC occurring on eight tree clusters, each composed of a central tree and the ten closest neighbors, were surveyed throughout the bottom three meters. A total of 80 species were encountered with an average of 4.94 ± 2.86 species per tree that peaked between 2–3 meters from the base. The EC of each tree cluster was characterized using Non-Metric Multidimensional Scaling (NMDS) and the influence of dispersal on the EC of the central tree(s) was assessed through tests of correlation at within and between tree-cluster scales between NMDS loading scores of the central tree(s) versus respective (1) distances; (2) compass positions; and (3) bole diameters. The influences of tree species identity and canopy cover on EC richness were assessed using simple rankings and logistic regression, respectively. In summary, little association was found between the EC of the central trees and any of the investigated parameters described above. We conclude that stochastic processes have a dominant role in structuring these communities.

Autumn Olive Alters Soil Chemistry and Enhances Native Plant Growth.

David L. Dornbos, Jr. and Joel Betts, Calvin College

Autumn olive (AO, *Elaeagnus umbellata*) is a non-native invasive shrub that has successfully colonized unmanaged fields and young forest understories throughout Michigan and the U.S. Midwest. Capable of nitrogen fixation by means of a mutualism with *Frankia* bacteria, there is evidence that interplanted autumn olive improved the growth of black walnut (*Juglans nigra*) in southern Illinois. The objectives of this study were to determine if AO seedlings improved the growth of native seedlings when planted together in small pots and to evaluate plant available mineral concentrations in soils with and without field-grown AO. Two seedlings of either AO and four native shrubs of similar size were planted in three liter pots, each species with another member of the same species or with AO. Native seedlings grown with AO consistently produced taller plants, greater leaf number, and higher chlorophyll content than those grown with another member of the same species. Soils from a disturbed location underneath 2–3 m tall AO shrubs contained more ammonium, nitrate, and sulfate, but lower concentrations of calcium, magnesium, and phosphate. No differences existed for soil pH or potassium concentrations. AO gains competitive advantage by changing soil chemistry and does nurse native shrubs within a growing season.

Forty Years of Forest Development in the Calvin College Ecosystem Preserve. Jonathan Knott and Randy Van Dragt, Calvin College

In 1974, the diameter at breast height (DBH) was measured for all trees in the Calvin College Ecosystem Preserve by Dr. Alan Gebben and John Ubels (a recent graduate). Each tree was categorized by species, size class, and health status. The trees have been re-measured on a 5 year interval. In 2014, we measured all trees >2.0" DBH in the original area (2.0 hectares) and expanded the sampling area to

include previous edges (an additional 2.0 hectares). In total, we measured 3009 trees $>2''$ DBH (in both sections combined), and counted 8652 saplings in the original quadrats. Using the historical dataset, we compared species composition, recruitment and mortality, diversity, and similarity of the forest over time. We also computed these indices for the new quadrats to compare the old-growth core with the earlier successional edges. We found that the original sampling area has been progressing towards, and is apparently stable at a Beech-Maple climax community due to decreasing species diversity and increasing importance of these two species. These species have shade-tolerant saplings which contribute to this trend. The edge areas had more earlier successional species with higher importance values, such as Red Oak and Wild Black Cherry.

Preliminary Report of a New Middle Miocene Megafossil Flora from Paddock Valley, Washington County, Idaho.. Patrick F. Fields, Orma J. Smith Museum of Natural History, The College of Idaho, and Olivet College; Howard L. Emry, Orma J. Smith Museum of Natural History, The College of Idaho

Collections in 1976 and 1988 suggested a previously unrecognized Miocene fossil plant assemblage in Paddock Valley (northwest of Boise), Washington County, Idaho. Annual collecting trips from 2000 through 2014 have generated foliar and reproductive remains from eight regions along both the eastern and western sides of the north-south trending reservoir located in the southern end of Paddock Valley. The material has led to the recognition of approximately 35 taxa in 29 genera—including a horsetail, two ferns, five conifers, one monocot, and at least 25 species of dicots. Although the preservation in water-laid ash makes precise identification a bit ambiguous, the more dominant plants (most frequent occurrence) are: *Metasequoia*, cf. *Castanea*, *Cercidiphyllum*, and *Ulmus*. Also present, are *Cornus*, *Platanus*, and *Prunus*, as well as locally abundant *Sequoia* foliage and cones. In stratigraphically lower (older) horizons are *Glyptostrobus*, *Acer*, *Arbutus*, *Betula*, *Mahonia*, *Quercus* spp., and *Salix*. What makes this new flora so distinctive is that the more abundant taxa are relatively rare in other similar aged, western Snake River fossil plant assemblages, while taxa common to this region of the Plain are largely restricted to the lower horizons of the Paddock flora.

Documenting Vegetation Cover Changes in Northern Alaska. Timothy F. Botting and Robert D. Hollister, Grand Valley State University

This study documents vegetation changes near Barrow, Alaska. Vegetation was sampled using a point frame method on 30 1-m² plots in years 2010, 2012, 2013 and 2014. Plants were identified to species and grouped into functional groups: bryophytes, deciduous shrubs, forbs, graminoids, lichens, litter or standing dead. Relationships between cover and abiotic variables were investigated: thawing degree days, air temperature, precipitation, thaw depth, soil temperature and soil moisture. The cover of all functional groups changed significantly over time.

Significant correlations included bryophyte cover with soil moisture, deciduous shrub and lichen cover with soil temperature and moisture, graminoid cover with thawing degree days, air temperature, precipitation and soil temperature, litter cover with thawing degree days, air temperature and soil moisture and standing dead cover with all variables except thaw depth. In summary, cover changes occurred over time but changes between intermediate years were large presumably from weather variability. Also, different functional groups correlated with different abiotic factors. While a longer consecutive time series is needed to better understand relationships between weather and cover, we show caution should be used when interpreting results of long-term vegetation monitoring if sampled over a coarse time series because large changes in plant cover occurred annually.

Diversity and Ecological Analysis of Vascular Epiphytes in Gera Wild Coffee Forest, Jimma Zone of Oromia Regional State, Ethiopia. Bedilu Tafesse, Ethio Organic Seed Action, Addis Ababa, Ethiopia

The abstract for this talk has been published in:

Tafesse, B. 2014. Diversity and Ecological Analysis of Vascular Epiphytes in Gera Wild Coffee Forest, Jimma Zone of Oromia Regional State, Ethiopia. *World Academy of Science, Engineering and Technology, International Science Index, Geological and Environmental Engineering* 1(5): 49.

The Long-Term Response of *Salix rotundifolia* to Experimental Warming. Ashley E. Brecken and Robert D. Hollister, Grand Valley State University

Climate change is a rising concern in the scientific community that affects the polar regions of the Earth more and at a faster rate than any other region. Changing tundra conditions could have global repercussions, and arctic plants are a critical part of the delicate landscape. This study examines the response of the deciduous shrub *Salix rotundifolia* to nearly two decades of experimental warming. The number of inflorescences, the leaf length, and the inflorescence height have been analyzed, along with phenology data, from 2010 to 2014. The inflorescence height and leaf length are longer, while there are fewer inflorescences in warmed plots than in control plots. The differences between warmed and control plots characterize the response *Salix rotundifolia* would have to climate change and suggest that the plant has become larger, and has focused resources on fewer larger flowers. Other studies show that the cover of the plant has also decreased with experimental warming. These findings suggest that the plant will do poorly in the future with climate change.

Chemistry

Earth Abundant Transition Metal-Based Electrocatalysts for the Conversion of Carbon Dioxide into Value-Added Products. Badrinath

Dhakai, Brooke Corbin, Daniel Kurtz, Richard Hulme, and Greg Felton, Oakland University

Due to its greenhouse effect, increasing carbon dioxide (CO₂) emission to the atmosphere is found responsible for the happening of global warming and climate change. Along with many other CO₂ emission mitigation strategies, research in the field of electrocatalytic conversion of CO₂ into value-added products has received significant interest in the scientific community. One of the envisioned processes involves the reduction of CO₂ to carbon monoxide (CO) which, in combination with hydrogen gas, is then subjected to Fischer-Tropsch techniques to make liquid fuels. We have investigated many organometallic manganese and rhenium complexes containing different bi-dentate ligands including phenanthroline (phen), bathophenanthroline (dpphen), bathocuproine (bcp), and substituted diaminobenzene using electrochemical techniques. Manganese catalysts containing dpphen and bcp catalyze the reduction of CO₂ to CO without external proton source. In presence of an external proton source such as methanol, Mn(NN)(CO)₃Br, where NN = diaminobenzene and diaminobenzoic acid, displays remarkable catalysis (i_{cat}/i_p values of 41.5 and 43 respectively). We will discuss our strategies for designing more efficient and robust catalysts by tuning electronic, steric, and local proton effects on the ligand platforms.

Multipurpose Medicine: The Synthesis and Medicinal Activity of Novel Warfarin Analogs. Souheila N. Hachem, and Shannon C. Timmons, Lawrence Technological University

Warfarin is a synthetic analog of the natural product dicumarol, the causative agent of hemorrhagic sweet clover disease. Also used as a rodenticide, this widely used anticoagulant drug functions as a competitive inhibitor of the enzyme vitamin K epoxide reductase. Although the anticoagulant effects of hundreds of warfarin analogs have been extensively studied, less attention has been focused on warfarin analogs' alternative medicinal potential as anticancer, antiviral, and antioxidant agents. Progress on the synthesis of a series of novel warfarin analogs using Michael-type condensation chemistry will be reported. Library members will be screened for a range of medicinal activities with the goal of further elucidating warfarin's full therapeutic potential.

A Prediction of a Luminous Red Nova Eruption. Lawrence A. Molnar and Dan M. Van Noord, Calvin College; Karen Kinemuchi, Apache Point Observatory; Chris J. Spedden and Steven D. Steenwyk, Calvin College

Luminous red novae (LRN) are a class of stellar eruption intermediate in luminosity between classical novae and supernovae. They are hypothesized to be the result of the merger of two main sequence stars. After the LRN outburst in 2008 of the star V1309 Sco, Tylenda et al. (2011, AA, 528, A114) found remarkable confirmation of this hypothesis in prediscovery data that exhibited

the light curve of a contact binary star system with an orbital period spiraling exponentially down to zero.

We will present analysis of light curves of the star KIC 9832227 spanning 15 years that show it is a contact binary system with a negative period derivative and second derivative.

Fitting the orbital timing to the exponential model provides a satisfactory fit. While we cannot yet conclude the system will follow the model fit, the prediction of accelerating orbital decay will soon be easily falsifiable. If the model holds up, an outburst should occur in about five years in which the brightness will increase 10,000 times, reaching an apparent magnitude of about 2 and making it one of the brighter stars in the sky. This is an unprecedented opportunity to study any sort of nova in advance of outburst.

Directed, High Yielding Synthesis of Arginine-Based Heterocyclic Amines.

Andrew Stewart and Ryan T. Hayes, Andrews University

Heterocyclic Amines (HCAs) are a group of mutagenic and carcinogenic chemicals that have been found in overcooked muscle meat from fish, beef, poultry, and pork. Research studies link the formation of HCAs to creatinine reacting with other amino acids at or above temperatures near 200°C. Our research has shown that arginine, prevalent in plants, is a potential source of a new class of HCAs due to its structural similarity to creatinine. Our research group has identified arginine-based HCAs from the direct burning of arginine with phenylalanine, but these products are produced in such small amounts that it makes molecular structural analysis challenging. We will present the results of a directed synthesis based on a published, two-step process that was used to make 2-Amino-1-Methyl-6-phenylimidazo [4,5-b]pyridine (PhIP). PhIP is the HCA resulting from burning creatinine with phenylalanine. The newly synthesized product(s) from this process is created by substituting creatinine with arginine to produce a molecule analogous to PhIP. The product is purified through extractions and chromatography, then analyzed by Nuclear Magnetic Resonance and mass spectrometry. Compounds from this directed synthesis are compared to the undirected burnings of phenylalanine with arginine to discover potential matches.

Extraction of Antioxidants from Chokeberries (*Aronia melanocarpa*) Using Supercritical Carbon Dioxide with an Ethanol Modifier.

Thomas Dixon, Evan Tucker, Arie Stuckey, Jonathan Wenzel, Lihua Wang, Michelle Ammerman, and Cheryl Samaniego, Kettering University

For millennia, plants and herbs have been used to treat a variety of ailments and diseases. It is the active compounds in these plants that can lead to many health benefits and curative properties. Chokeberries, a shrub native of eastern North America, are widely known for their astringent properties and the berry is

used as a flavorant in wines, jams, and tea. In addition, chokeberries are high in antioxidant polyphenolic compounds and are being evaluated for their effects in preventing disease. The active compounds in chokeberries can be extracted, purified, and concentrated to improve their potency using supercritical carbon dioxide with ethanol, solvents that are generally recognized as safe by the US FDA. Supercritical fluids exhibit both liquid and gas-like properties and may effectively extract compounds which are normally destroyed by other extraction methods. A factorial experimental design was used to evaluate the effects of pressure, ethanol content, and temperature upon the antioxidant potential of the extracts. The antioxidant potential and DNA cleavage protecting activities of the chokeberry extracts prepared under different conditions were determined. Based upon these results the optimum extraction conditions for various therapeutic potentials will be discussed.

Optimization and Plant Simulation of Producing of Biodiesel from Michigan Soybean Oil Using Supercritical Methanol. Jonathan Wenzel, Jason Davis, Endel Maricq, Michael Stogsdill, and Ali Zand, Kettering University

Biodiesel is an affordable and renewable transportation fuel. In the United States, biodiesel is commonly produced from virgin and used soybean oil. Conventional production of biodiesel is typically catalyzed in batch reactors using a caustic catalyst, such as potassium hydroxide, with reaction times greater than 1 hour. Supercritical methanol is an alternative to catalyzed biodiesel production due to higher reaction temperatures and better mixing which results in shorter reaction times. As a consequence, biodiesel could be produced using smaller flow reactors that require less labor than larger conventional batch reactors. An experimental study evaluating virgin Michigan soybean oil to produce biodiesel, conducted at Kettering University, determined potential optimal conditions for producing biodiesel using supercritical methanol in a batch reactor. It was found that nearly 100% of the soybean oil reacted to produce biodiesel in under 10 minutes at 350°C. This reaction time may be less, but is beyond operating limitations of current test equipment. Using these results, the production of biodiesel using a continuously stirred tank reactor (CSTR), a flow reactor, was simulated using the AspenPlus™ chemical process simulator. Process design strategies and potential optimal biodiesel plant configurations will be presented.

Optimization of Hydroxyl Number Determination of Hydroxyl-Functionalized Dendrimers Utilizing NIR Spectroscopy. Seth Stacey, Hwuk Chan Woo, and Ryan T. Hayes, Andrews University

Dendrimers are an emerging class of additives for a variety of industries such as the paints and coatings, plastics, adhesives, inks, and personal care products but the high manufacturing cost and lack of quality assessment are proving to be barriers for commercial entry into these industrial fields. Previous research has shown that NIR spectroscopy works well to determine the outer functional group

density of hydroxyl groups (OH#) on a variety of linear and branched polyols. We have adapted these methods and developed a protocol to determine the OH# on hydroxyl-functionalized dendrimers using NIR absorbance spectroscopy. Our initial method consumed a substantial amount of material costing hundreds of dollars per OH# analysis since the method consumed the sample by comingling with a high boiling solvent. Optimization of sample size, sample concentration, and sample containment along with rigorous moisture control now allows for effective NIR analysis of the hydroxyl number of high valued hydroxyl-functionalized dendrimers without the high cost. This method can also be adapted for the simultaneous determination of hydroxyl number and water content with further studies. Hydroxyl number determinations using NIR spectroscopy allow for quick, effective quality control analysis for formulators and manufacturers in the commercial use of dendrimers.

Electrospinning and Characterization of Polyvinylalcohol Nanofibers.

Steven Nartker, Michael Stogsdill, Lihua Wang, and Devin Aryan, Kettering University

Pure polyvinyl alcohol (PVOH) and PVOH loaded with gold nanoparticles were electrospun to form nonwoven mats. Gold nanoparticles were synthesized using the Turkevich method. The synthesized nanoparticles were added to PVOH solutions and electrospun. The concentrations were varied to obtain sub-micron and nanoscale fiber mats. Fiber mats were analyzed using scanning electron microscopy (SEM), contact angle analysis, Fourier transform infra-red spectroscopy (FTIR) and thermal gravimetric analysis (TGA). The fiber morphology, surface chemistry and contact angle data show that these electrospun materials are suitable for applications including biosensing, biomedical and tissue engineering.

Synthesis of Isoxazoline Derivatives as Potential Anti-Cancer Agents.

Rosanne Thornhill and Lisa Ahlberg, Andrews University

Isoxazolines are five-membered ring heterocycles containing nitrogen and oxygen possessing diverse synthetic and biological properties. The isoxazoline moiety is important in medicinal chemistry, with reported anti-inflammatory, anti-viral, antifungal, antibacterial, anti-tuberculosis, analgesic, anticonvulsant and anti-cancer activity. A study on dibenzoazepine tethered isoxazoline derivatives has explored these molecules as possible anti-cancer agents, combining the potential DNA-damaging effects of dibenzoazepines and isoxazolines. When tested against murine osteosarcoma cells, human ovarian cancer cells, human melphalan-resistant multiple myeloma cells and human breast cancer cells, results showed increased inhibition of invasion, migration and proliferation of some of the cancer cells. PK11195, a derivative of benzodiazepine, has known activity against tumor cells through mechanisms still actively studied. This research aims to design, synthesize, and characterize a novel compound that

exhibits key structural and medicinal qualities of both a dibenzoazepine-tethered isoxazolines and PK11195.

Racemization Analysis of Amino Acids in Avian Egg Shells. Tia Mackintosh and Lisa Ahlberg, Andrews University

L-amino acids are the building blocks of proteins in eukaryotic organisms; these amino acids will undergo racemization over time to reach equilibrium with their D counterpart. This equilibration information has been used in prior studies to determine the age of different types of shells, bones, and teeth. We would like to apply this technique using reversed-phase HPLC to analyze protein degradation within samples of avian eggshells by observing the racemization of amino acids from eggshells that have been treated under various conditions to replicate possible environmental effects. We have started with sample preparation techniques and HPLC methods used by different authors and are working to improve the methodology for our analytes. HPLC detection limits are tested as only a very small amount of amino acids are released from the calcium carbonate matrix of the eggshell.

Development of a New Method to Analyze Biodiesel by GC. Michael Stogsdill, Jonathon Wenzel, Jason Richardson, Endel Maricq, and Ali Zand, Kettering University

A method has been developed for analyzing biodiesel samples with a wide range of compositions. The basic method borrows from ASTM standard 6751 with several key improvements. The samples are derivatized via a solvent mediated silylation reaction with a clear excess of N-Methyl-N-(trimethylsilyl) trifluoroacetamide (MSTFA). The samples are allowed to react for 12 hours at room temperature and then the reaction is quenched by the addition of n-heptane. GC-FID with a standard split/splitless injector is used as opposed to the nonstandard cool-on-column injector used in the ASTM standard. All samples and internal standards are weighed using a precision analytical balance. Total sample size is kept small in order to minimize cost per sample. Total free glycerin, monoglyceride, diglyceride, and triglyceride content are determined well within the margin of error set forth by the ASTM Standard.

Cell Protrusion and Retraction Driven by Fluctuations in Actin Polymerization: A Coarse-Grained Model. Gillian Lynn Ryan, Kettering University; Naoki Watanabe, Kyoto University; Dimitrios Vavylonis, Lehigh University

Actin is a polymeric cytoskeleton protein found in nearly all eukaryotic cells. Actin polymer dynamics regulate cell shape changes essential for many cellular processes including division and motility. Animal cells that spread onto a surface often rely on actin-rich cell extensions called lamellipodia to execute cell

protrusion. XTC cells on a two-dimensional substrate exhibit regular protrusion and retraction of their lamellipodium, even though the cell is not translating. Travelling waves of protrusion have also been observed, similar to those observed in crawling cells. These periodic fluctuations in leading edge position have been linked to excitable actin dynamics near the cell. In this talk we present a model of actin dynamics in two-dimensions (along the arc-length and radial directions of the cell) and include a model membrane that protrudes and retracts in response to the changing number of actin filaments near the membrane. We show that if the polymerization rate of these filaments changes depending on their local concentration at the leading edge and the opposing force from the cell membrane, the model can reproduce the patterns of membrane protrusion and retraction seen in experiment. The model generates predictions for the behavior of cells after local membrane tension perturbations.

Modification of Crystal Growth Rates to Control Thermal Outcomes of Phase Transitions. Frederick Garcia and Rebecca Mikilajczyk, Kettering University; Shalini Lakshmanan, Huron High School; Gillian Lynn Ryan and Uma Ramabadran, Kettering University; Grace Hsia and Rachel Rademacher, Warmilu LLC

Phase change materials (PCMs) have been investigated as latent heat energy storage materials. Sodium acetate trihydrate (SAT) is a PCM commonly used in recovering thermal energy for nonelectric personal warmers. The maximum temperature attained and the cooling rate is proportional to the supersaturation level of the SAT solution. In order to maximize latent heat recovery the approach taken is to mix a highly supersaturated solution with an additive that can slow down the crystal growth rate and extend the time duration of heat release. This work investigates effects of adding silver nanoparticles to supersaturated SAT solutions on the thermal outcome during phase transition. The radial rate of crystal growth was measured using video image analysis software. The crystal growth is linear over time and the rate is found to be maximum for an intermediate concentration of nanoparticles. Powder X-ray diffraction data from sample crystals maintained at constant humidity for several weeks were obtained to investigate the effect of nanoparticles on crystal structure. The results indicate that the crystal structure is strongly modified with the addition of 10nm size silver nanoparticles, but not affected when larger size particles are added.

Microwave-Assisted 1, 3-Dipolar Cycloaddition of Spiro-Isoxazolines.
Alanna James and Lisa Ahlberg, Andrews University

Isoxazolines and their derivatives are known to possess various biological applications. In particular, certain spiro-isoxazolines have been found to have anticancer capabilities. One of the most prevalent ways in which isoxazolines are produced is through 1, 3-dipolar cycloaddition. While effective, this reaction does have its downsides, due to factors that often accompany it, such as harsh

conditions and toxic solvents. As an alternative method, microwave-assisted 1, 3-dipolar cycloaddition can be used as a more environmentally friendly approach to the synthesis of isoxazolines. This approach has been found to not only provide a cleaner reaction, but to reduce the length of reaction and increase the amount of product formed. My research will involve an evaluation of the aforementioned microwave-assisted method in the synthesis of spiro-isoxazolines, with special attention given to one specific compound that has been shown to have anticancer properties. Through instrumental analysis, the effectiveness of this reaction will be able to be determined. In the absence of a microwave reactor, a microwave oven will be utilized, and the effectiveness and efficiency of this machinery will be analyzed as well.

A Determination of BPA and Phthalates in the Clinton River and Anchor Bay Watersheds. Kathryn Wheeler, Lawrence Technological University

Natural water samples from three various locations in the Clinton River and Anchor Bay Watersheds were collected and analyzed for Bisphenol-A and phthalates using EPA method 525.2, which involves passing the water samples through a liquid-solid extraction cartridge. BPA and phthalates are commonly found in plastics and are known endocrine disruptors in aquatic organisms. Some phthalates have also been classified as probable human carcinogens. According to the EPA, current exposure levels to humans are below potential health effects levels, but research is continuing to develop to prevent higher exposure and possible health risks. A GC-MS was used for quantification and identification of the compounds being observed. The detection limit on the GC-MS for all compounds was also determined. Only glass materials were used for the extraction apparatus and storage containers, including those of solvents involved, to reduce risk of background contamination.

Electrical Pacing of Cardiac Tissue Including Potassium Inward Rectification. Suran Galappaththige and Bradley J. Roth, Oakland University

During pacing of the heart, cardiac tissue is stimulated electrically through a small, unipolar electrode. Numerical simulations based on the bidomain model—a two-dimensional cable model—indicate that around an electrode are adjacent regions of depolarization (transmembrane potential positive relative to the resting potential) and hyperpolarization (transmembrane potential negative relative to the resting potential). However, when pacing resting tissue, experiments indicate that the hyperpolarization is often suppressed. Our goal is to determine if the inward rectifying potassium current (IK1) can explain the suppression of hyperpolarization. Numerical simulations were carried out using the bidomain model with potassium dynamics specified to be inward rectifying. As in previous simulations, adjacent regions of depolarization and hyperpolarization surround the electrode. For cathodal currents the virtual anode gives a hyperpolarization that decreases over time, and for anodal currents the depolarization at the virtual

cathode increases over time. For long duration pulses, the current-voltage curve is nonlinear, with very small hyperpolarization compared to depolarization. For shorter pulses, the hyperpolarization is more prominent. In conclusion, the inward rectification of the IK1 potassium current explains the suppression of hyperpolarization for long duration stimulus pulses, but not for short duration pulses.

This research was supported by a grant from the National Institutes of Health (R01HL118392).

Supercritical Fluid Extraction of Polyphenolic Compounds from Walnut Husks. Evan Tucker, Thomas Dixon, Arie Stuckey, Lihua Wang, Michelle Ammerman, Cheryl Samaniego, and Jonathan Wenzel, Kettering University

Walnuts are rich in omega-3 fatty acids and contain a multitude of antioxidant compounds that have a variety of health benefits such as lowering the risk for heart disease and treating autoimmune disorders. The walnut consists of a fibrous outer layer or husk, a woody inner layer or shell, and the edible seed. The husk is frequently discarded during processing, though it is a source of stains and was once used to make ink. Walnut husks were extracted using a mixture of supercritical carbon dioxide with ethanol batch-wise. Supercritical fluids may be used to extract antioxidant compounds from plants due to unique solvent properties, and ethanol is added to increase selectivity in extracting slightly polar polyphenolic antioxidant compounds. The effect of temperature and ethanol proportion upon the antioxidant potential of walnut husks was evaluated using the Ferric Reducing Ability of Plasma (FRAP) assay.

Transesterification of Virgin Michigan Soybean Oil to Produce Biodiesel Using Supercritical Methanol. Jason Davis, Endel Maricq, Jonathan Wenzel, Michael Stogsdill, and Ali Zand, Kettering University

Virgin and used soybean oil is the leading feedstock for producing biodiesel in the United States and biodiesel production is on the rise. The United States is the second largest producer of soybean oil, with 9.1 million metric tons produced in 2013. Michigan is the twelfth largest soybean producing state in the US. Biodiesel, a renewable transportation fuel, is conventionally produced in batch reactors with reaction times greater than 1 hour using a base catalyst such as potassium hydroxide. Biodiesel may be produced using supercritical methanol resulting in significantly reduced reaction times at temperatures between 250 and 350°C. Supercritical fluids exhibit liquid and gas-like properties and can be exceptional solvents and reaction mediums due to their high diffusivity. The conversion of Michigan soybean oil to biodiesel were evaluated in an agitated 500 mL Hastelloy® C276 batch reactor. The effects of temperature, proportion of acetic acid as a catalyst, methanol concentration, and reaction time will be presented.

Synthesis and Characterization of Conjugated Naked Silver Nanoparticles with Sulfur Containing Organic Compounds. Noah Chun and Getahun Merga, Andrews University

Metallic particles have distinct optical properties in the UV-Visible spectrum. Collective excitation of the electronic cloud at the surface of the particles leads to resonance absorption and scattering. Manipulation of the NP surfaces by attaching antibodies or other ligands (such as vitamins, amino acids or different sulfur containing organic compounds) allows the NPs to preferentially target cells which express receptors that correspond to the NPs' surface ligand in recent applications. We describe in this work the synthesis of silver nanoparticles upon reduction of Ag_2O by molecular hydrogen and or by acetylacetonate (acac) followed by cleaning the particles from the reductant reagents. These particles contain no foreign stabilizers or any ions other than those from silver and water. Our current work shows that naked gold and silver nanoparticles (NGNP) can be produced in aqueous solution. The clean or naked nanoparticles of silver would be assembled by using sulfur containing organic molecules and selected amino acids. The resulting conjugated NGNP will be characterized by employing transmission electron microscope (TEM), dynamic light scattering, electrophoretic mobility, pH meter, inductively coupled plasma atomic emission spectroscopy (ICP-OES), and UV-VIS spectra.

Determination of the Magnetocrystalline Anisotropy Constant from the Frequency Dependence of the Specific Absorption Rate in a Frozen Ferrofluid. Brandon Aho, Emily Perkins-Harbin, Nathaniel Mosher, Lihua Wang, Ronald Kumon, Ronald Tackett, and Corneliu Rablau, Kettering University

Colloidal suspensions of superparamagnetic nanoparticles, known as ferrofluids, are promising candidates for the mediation of magnetic fluid hyperthermia (MFH). In such materials, the dissipation of heat occurs as a result of the relaxation of the particles in an applied ac magnetic field via the Brownian and Neel mechanisms. In order to isolate and study the role of the Neel mechanism in this process, the sample can be frozen, using liquid nitrogen, in order to suppress the Brownian relaxation. In this experiment, dextran-coated Fe_3O_4 nanoparticles synthesized via co-precipitation and characterized via transmission electron microscopy and dc magnetization are used as MFH mediators over the temperature range between -70°C to -10°C (Brownian-suppressed state). Heating the nanoparticles using ac magnetic field (amplitude ~ 300 Oe), the frequency dependence of the specific absorption rate (SAR) is calculated between 150 kHz and 350 kHz and used to determine the magnetocrystalline anisotropy of the sample.

Locating Gravitational Waves with BayesWave. Belinda D. Cheeseboro and Tiffany Summerscales, Andrews University

LIGO is the Laser Interferometer Gravitational Wave Observatory. Its mission is to detect gravitational waves that could be caused by the interaction of massive gravitating bodies such as coalescing black holes, in-spiraling neutron stars, etc. BayesWave is an algorithm that can analyze possible gravitational wave event data and determine the properties of candidate events such as sky location. This algorithm uses a combination of Bayesian probability theory and the Reverse Jump Markov Chain Monte Carlo method to accomplish this goal. This study applies BayesWave to mock events in order to measure its efficacy and compare it with other parameter estimation methods.

Communication

Urban Mission and Public Subject. Michael McGinnis, Wayne State University

Throughout his 1965–71 tenure as president of Wayne State, William Rea Keast repeatedly invoked the urban university as a new configuration of institutional responsibility to the problems of urbanization and inner city life. As envisioned by Keast, the urban university is uniquely situated to study and reform complex problems like racial inequality, poverty, and educational access. As a scholar of rhetoric and the public sphere, I am especially interested in how this vision of the urban university positions institutions like Wayne State in relationship to other subjects in their shared publics. In this paper, I draw on the Keast archive at Wayne State's Reuther Library to argue that Keast's papers suggest a call for urban universities to play a greater role in their own constituent publics. In so doing, I claim that Keast points us to ways we might reconfigure our conceptions of institutions as public subjects acting in their local contexts.

Black Music and Identity: How Commodification Changed the Narratives of R&B Music. Meika J. Cole, Oakland University

This paper engages in a careful examination of how African-American identity has been impacted by popular culture, specifically the commercialization of black music. Over the last 30 years, the soul of black music has been replaced with a more homogenized sound that embodies the characteristics of popular music, as defined by a European ideology. As the genre gained crossover acceptance in the 1940s, texts that once signified black cultural identity and family unity have now been replaced with those of extreme materialism, violence and promiscuity. The more commercialized the genre becomes, the message of love, freedom and self-expression for the black community gets more diluted, which leaves us to question whether or not the soul of black music is dead and if it can ever be revived.

The Artificer of Persuasion: Using Plato's Gorgias to Teach Digital Citizenship to Secondary School Students. Serge Danielson-Francois, Lawrence Technological University

At Divine Child High School, we have launched a digital citizenship initiative to reclaim public and private online spaces. Our conversation has centered on the extent to which rhetorical flourish skews debate and inhibits consensus-building. In the context of political rhetoric, we have considered rhetoric's role in fracturing the body politic. We have used the contentious online debate in popular and social media on immigration as a case example. We have sought to test the Socratic claim that in matters of rhetoric (and life) "it is better to suffer a wrong than to do a wrong." When our rhetoric falls apart, the truth suffers and we grow further apart. Civility requires us to promote informed conversation on issues of conscience. Seeking the truth must be the litmus test for whether online conversation partners are engaged in a socially responsible task for the benefit of all. Too often, social media participants adopt the conceit (co-opted from the prophetic witness of Isaiah) that their role is to "comfort the afflicted and afflict the comfortable." This is somewhat far afield from the fundamental focus on truth-seeking that must guide civic discourse in any civic setting (local, state, regional, federal, virtual) that hopes to cohere.

Constructing Meaning through Metaphors: Using Objects to Describe Close Work Friendships. Jennifer Ptacek, Western Michigan University

Liebenberg (2009) asserts that pairing visual images from participants with descriptive dialogue about their experiences can increase the validity of data analysis. For example, photography has recently been used to examine communication phenomena such as development and social change (Fraser, Brown, Wright, and Kiruswa, 2012), homelessness (Peterson, Antony, and Thomas, 2012), and unemployment (Gist, Dougherty, and Wickert, 2013). Expanding upon the method of using images, physical objects may offer powerful metaphors to gain understanding of an individual's experiences. The use of objects may allow participants to communicate with researchers in a new way that provides a unique look into peoples' lives. One area of study in which participant object description has not been applied but may be especially interesting is workplace friendship. Friendships between work peers are the most common and beneficial type of workplace relationship (Sias, 2005). By asking workplace friends to use objects to describe their relationship, they are ascribing meaning and providing more insight into why their friendship is valuable and satisfying. This research focuses on the use of participants' personal objects during interviews as a particularly novel technique that can be used to gain a deeper understanding of the intricacies of close work friendships.

Communicating through Technology: The Use of Cell Phones and Social Networks in Relationships. Ashley C. Coates, Oakland University

The use of cell phones and social networks (SN) has become a common way to effectively and efficiently communicate with others in today's society. These forms of communicating do cause problems in specific types of relationships.

Within romantic relationships the improper use of cell phones and SN have become a source for relational transgressions. These transgressions then lead to relational uncertainties that can cause many problems within a relationship to form. Relational problems can lead to destructive behavioral patterns that can result in the termination of the relationship. Partners can prevent the usage of cell phones and SN from ruining their relationship but only if they're willing to take the time to find out what the solutions are and apply them. Past research on how SN affect relationships has focused on community-based SN like Facebook. In this paper, it is proposed that future research should look into newer forms of SN that focus on group messaging as a way in which people interact with each other including how they interact in romantic relationships.

Using the Personal Perspective and Experience to Enliven and Enrich Social Science Research. Rachel Williams-Smith, Andrews University

Autoethnography draws on the personal perspective and experience, and is useful for providing deep insights into the lived experience. Similar to autobiography, it differs in that it is concerned with the individual experience in relationship to culture rather than just the individual experience. In this study, autoethnography is used to research the impact of religion on intercultural adaptation in an unusual incidence. The religious subculture here was based on a literalistic, rule-based interpretation of historic Adventist ideology and shaped by an extreme focus on preparation for Christ's return and separation from "the world." This study exemplifies that autoethnography can provide an effective option for conveying the lived reality within the subcultural environment as well as subsequent adaptation challenges once the researcher entered a broader sociocultural environment. It concludes that notions of ultimate reality predisposed and shaped psychological and social aspects of adaptation after the original religious subcultural context was no longer available.

Expectancy Violations among Facebook Friends Regarding Hate Speech Use. Jasmine LaBine, Western Michigan University

The American public is being continually exposed to issues of race and sexual orientation with issues such as the Trayvon Martin shooting, the riots in Ferguson, Missouri in response to the shooting of Michael Brown by police officer Darren Wilson, and the ongoing same-sex marriage debate. Increased exposure to such issues allows for more diverse opinions regarding race and sexual orientation, with Facebook being a primary outlet for social commentary, some of which may include hate speech.

Using Expectancy Violations as a theoretical foundation, I will measure the frequency with which Facebook users expect to encounter posts by friends containing hate speech, ask questions regarding valence reactions to such posts, and examine whether demographics of participants have an effect on reactions to

posts by Facebook friends containing hate speech through a mixed-methods, Likert-style survey with one additional open-ended question regarding response to Facebook posts.

Black Women in the Media and the Effects Thereof. Persephanie Chiddick, Andrews University

This research looks at the way African American women are shown in the media and the effects that portrayal has on society. Black women in the media isn't a topic that is widely researched, i.e., the information should be outdated, however many of the stereotypes and tropes mentioned previously are still present in media today. This paper tackles the myths that are widely believed about black women due to the images that are shown in the media. This research draws upon stereotypes and tropes that were discovered and explained by award winning sociologists such as Bell Hooks and Farai Chideya. It also uses communication theories such as Cultivation Theory and Agenda Setting theory to understand and analyze the effects media has on media consumers. These theories explain that media consumers have no say in how the media affects them. Also, it addresses the fact that media plays a very important role in the forming and shaping of media consumers' worldviews. This paper shows how the media shapes our opinion of a minority group and the negative effects it has on society at large.

Computers

Erlang Support for Fault-Tolerant Application Design. Ishwar Rattan, Central Michigan University

Increasingly pervasive dependence on computers in modern society dictates that computers be dependable. Current computer hardware is much more reliable than the software applications that it runs. This prompts a push towards design of fault-tolerant application (FTA) software. There are two essential requirements for FTA design: one is the ability to detect that an error or failure has occurred and the other is to initiate a recovery from that error. Generally, an application is implemented as a program in a specific programming language (PL). A majority of PLs in use today do not have much support for FTA design. This presentation explores Erlang PL features for writing FTA software, with examples. Erlang is a concurrent, distributed functional PL. Its computation model is based on Actor model (process in Erlang). Erlang has three notable features to support FTA design: first is the support for exceptions and exception handling to force abnormal termination of a process; second is the support for linking two processes such that if one process fails the other process can be notified about this event; and third is the support to initiate a recovery from fault by restarting (backward recovery) of the failed process. The linking among more than two processes is also supported.

Programming for Quantitative Applications. Ranjan Chaudhuri, Eastern Michigan University

Quantitative reasoning is the first and foremost reasoning. It is not mathematical manipulation or computation, but rather the methodology used to analyze quantitative information for making decisions, judgments and predictions. It involves formulating a solution for a real-world problem by using a suitable representation, deducing consequences, formulating alternatives and predicting outcomes.

Learning to program using an object-oriented language, such as Java, appears to be difficult for many beginning computer science students. Many educators believe that a prior programming experience without the objects approach would help alleviate the problem. The paper outlines the design of a computer programming course with applications in quantitative problem solving. Such a course would help students develop the logical reasoning skills that are necessary for advanced programming.

Human Factors in IT Security. Gregory Laidlaw, University of Detroit Mercy

The primary purpose of securing our IT systems is to allow easy access to these system for authorized users, while denying access to un-authorized users. However, all of the methods used to secure our systems involve humans and human interaction, which are subject to human error. How do we design and implement security measures that are not accidentally or intentionally circumvented by the very people that they are designed to protect? As IT professionals we prefer to focus on technical solutions to our problem while ignoring the human factors. This paper proposes that considering human factors in design and implementation of security systems can provide more effective security at a lower cost of ownership.

Authenticating Computer Users by Mouse Activities. Khandaker Abir Rahman, Ryan Moormann, and Danielle Dierich, Saginaw Valley State University

User authentication through computer activities such as typing, mouse events, and application usage behavior is gaining momentum in recent days. Among these modalities, young but promising mouse dynamics remains as an active area of research. In this research, we are developing a user authentication system based on mouse dynamics. Using our developed mouse-logger program, we collected mouse events (2D position of cursor, mouse button up-down with associated timestamp) from 60 volunteers. Each volunteer was asked to perform their regular computer activities for one hour in two different machines on two different days allowing us to record 225,000 mouse events. After preprocessing (outlier filtering) the events, we defined six features: cursor speed, acceleration, jerking, single left-click interval, double left-click interval and time length of a mouse movement

before pausing. Each user's training template containing feature values was compared against test samples (collected on second day) of all 60 users. Therefore, in total, we are experimenting with 60 genuine and 3540 impostor authentication attempts. We designed our own pattern matching algorithm that generates a matching score that falls between 0 (for perfect mismatch) and 1 (for perfect match). Our initial results were found to be promising, showing higher genuine authentication scores compared with impostor authentication scores.

An In-Depth Look at Recent Cyberattacks. Aby Tehranipour, Eastern Michigan University

The widespread use of mobile devices, mushrooming of wireless networks, and rapid growth of app technology has opened up a new set of vulnerabilities. The number of recent cyberattacks is evidence that hackers have been successful in developing new techniques for exploiting these vulnerabilities. There have been numerous major cyberattacks around the world recently. The attackers have deployed malware targeting government agencies, utility companies, businesses, industrial plants, and banking systems to list a few. US companies experienced several cyberattacks in 2014 causing both monetary and public relation damages. The level of complexity and sophistication of some of these malware have raised suspicion amongst security experts and researchers that they might have been developed and deployed by nation-states rather than individuals or groups.

This paper gives an overview of the techniques used in recent cyberattacks. It examines the attack vectors for two of the most sophisticated and highly dangerous malware, namely Stuxnet and Regin. The Stuxnet malware was deployed to disrupt Iran's nuclear capabilities whereas Regin is designed to steal secrets and has been targeting computer systems in several Asian and Middle Eastern countries. Lastly, it outlines security measures that can be deployed to defend against similar cyberattacks.

Economics

Mean-Square Stability and Adaptive Learning in Regime-Switching Models. Jason R. Reed, Wayne State University

This paper analyzes the necessary and sufficient conditions for stability under recurring structural changes. Using a finite state Markov process to model stochastically evolving, state-dependent parameters I find that by employing the conditions unique to mean-square stability, the minimum state variable (MSV) solution, found in non-linear models of this reduced form, is also stable in the learning sense; that is to say, they are e-stable. However, the choice of parameter values limits the robustness of this result. Furthermore, to illustrate this outcome I develop empirical results for a model similar to Cagan's 1956 work on

hyperinflation for Germany and the United States. I find that during the time of active currency market intervention, monetary policy was not mean-square stable for both the U.S. and Germany. Thus, monetary policy during the the 1980s was unstable.

The Effect of Monetary and Fiscal Policies on Gross Domestic Product.

Jaclyn Richert, Oakland University

Classical and Keynesian economists disagree on the effect of government policies on economic output. According to classical theory, the economy will eventually adjust on its own without the need for government intervention. Because they view output as supply determined, classical economists believe monetary and fiscal policies are ineffective. On the other hand, Keynesians believe output is determined by aggregate demand and advocate government policy action to control growth in the economy. The purpose of this paper is to examine these two opposing viewpoints and determine if money supply, interest rate, taxes, and government spending have a significant impact on output. This study estimates a multiple linear regression model on GDP in the U.S. using quarterly data over the period 1999–2012. The results indicate that although these variables may be correlated with GDP, based on the t-statistics obtained for the hypothesis testing, they are not statistically significant. This model supports classical theory and suggests that government policies affecting the money supply, interest rate, taxes, and level of government spending, should not be used to significantly impact GDP.

Analytic and Heuristic Modeling of Financial Turbulence. George Chang, Grand Valley State University

Chow, Jacquier, Lowrey, and Kritzman (1999) introduced a mathematical measure of financial turbulence, which originally was developed by Mahalanobis (1927, 1936) to analyze human skulls. Kritzman and Li (2010) extended this research by investigating the empirical features of financial turbulence and by demonstrating how this methodology can be used to stress-test portfolios, to construct turbulence resistant portfolios, and to scale exposure to risk to improve performance. They showed successful empirical performance by the “financial turbulence” measure. In relation to those prior studies, this paper has two major contributions to the field. First, we unmask this mystical mathematical measure by recognizing its connection with a multivariate normal distribution. This recognition is very important, yet it was never made in prior studies. The discovery of such a special connection between the “Mahalanobis distance” (or “financial turbulence”) and a multivariate normal distribution sheds light on why and how the former works. Second, we further explore the discovery and suggest a unified and more efficient method to modeling financial turbulence. We also apply the proposed method to financial markets data and discuss the empirical features comparatively.

Unintended Consequences of Low Inflation. Ronald L. Tracy, Oakland University

The US has achieved low inflation since the late 1980s. This has been hailed as a great benefit to the economy since low inflation reduces nominal interest rates, is conducive to financial stability and has helped achieve strong economic growth over almost 30 years. However, I intend to demonstrate that one of the costs of this low inflation has been slow economic recovery in each of the last 3 recessions (1990, 2001, 2007–8). My research intends to show that although low inflation helped have a strong 25 year growth rate, there was a high cost due to slower growth during the recovery years than was true prior to 1985. This may suggest that a policy that tries to achieve a 4 to 4.5% inflation rate (rather than 2% to 3% inflation rate) may lead to even stronger economic growth over the entire period. This would result from the slightly lower growth rate after an economic recovery, being more than offset by the speedier recovery after the bottom of a recession.

Revisiting Adam Smith: Alienation, Education, and Democracy. David McClough, Ohio Northern University

In *Wealth of Nations*, Adam Smith dismantles the logic of mercantilism. Smith encourages readers to acknowledge that the accumulation of specie is not the source of national wealth, but rather the division of labor that increases production and therefore consumption is the source of wealth. This paper examines Smith's prescient anticipation of the pernicious effects of the division of labor. As a philosopher in the midst of the Age of Reason, Smith concerns himself with the purpose, functions, and implications of political economy at the levels of both the nation and the individual. In so doing, he identifies alienation as a threat to individual well-being. This paper reviews excerpts from *Wealth of Nations* that predict the alienating effects of mass production as well as excerpts proposing that the state provide education to offset the deleterious effects of industrialization. The paper links Smith's concept of alienation to the Job Characteristics Model that informs modern theoretical attempts to assess and improve worker satisfaction. The paper asserts that the effects of alienation extend beyond workers to the detriment of civil society and the maintenance of effective democracy. A review of empirical research anticipates a discussion of implications for current education policy.

Economic Events and Environmental Policy. Jake Brower and Feler Bose, Alma College

This article seeks to investigate how environmental policy-making in the fields of building and transportation is impacted by environmental incidents at the state level. Environmental policy researchers have identified several factors and their impact on states' ability and willingness to create green policies.

Previous Econometric results from longitudinal data have indicated that states that witness environmental incidents in the current period are less likely to formulate environmental policies during the same period. However, when environmental organizations root their advocacy programs on previous periods' environmental incident(s), it has a positive and significant impact on environmental policy-making (Bose and Pandey, 2014). This article goes further to explore the impact of environmental incidents to see whether it impacts building and transportation policy. The results contribute to our understanding of the critical factors of environmental policy-making in building and transportation issues, and also how organizations can use incidents to influence state-level policy making.

Do Interest Rates Affect Exchange Rates? Anthony Stojke, Oakland University

This paper studies the relationship between interest rates and the exchange rate in the U.S. and Japan using regression analysis on quarterly data from 1994 to 2011. Previously published literature was used to form the model and then all appropriate data were collected. This was followed by the initial estimation and hypothesis testing of each variable. Four assumptions had been made about the disturbance term: no correlation between the variables and the disturbance term, the residuals have a mean of zero, the error terms for each observation are independent of one another, and the data are normally distributed. These assumptions were tested using the Hausman test, Ramsey RESET test, Breusch-Godfrey serial correlation test, and the Jarque-Bera test, respectively. After correcting for endogeneity, a functional form problem, and autocorrelation, the model was re-estimated and the hypothesis testing was conducted on each variable. The long-term interest rate was found to have a statistically significant effect on the exchange rate, while the short-term interest rate was not. Finally, the model was tested for stability. It was suspected that a different model may be necessary for the "lost decade", though the Chow test provides evidence that this was not the case.

Education Effects on Unemployment Rates. Veronica Radjewski, Oakland University

Using U.S. state data from 2012 this model investigates how level of education affects unemployment rates, measuring the effects of high school dropouts and percent of the population with a college degree per state. This paper discusses the importance of getting a proper education to not only better one's self, but help to stimulate the economy through lowering unemployment rates. Other factors are also considered in what may be affecting unemployment rates, such as the job growth rate from 2011 to 2012, labor force rate, median income, minimum wage, median cost of a housing unit, percentage of the population over 65, tuition rates, and percentage of workers in unions. Testing suggests that education does have an

effect on unemployment rates, but it also suggests that increases in education do not always cause a drop in unemployment rates. There is a weight put on at least obtaining a high school diploma or its equivalent, but acquiring a bachelor's degree or higher does not have a significant effect on U.S. unemployment rates.

How Does Monetary Policy Impact the Inflation Rate? Gaurav Atwal,
Oakland University

In this paper I will be discussing the effects the monetary policy has upon the inflation rate. This is a relevant topic following one of the worst economic recessions the United States has faced. To thoroughly test this model, I will begin by reviewing a variety of scholarly journals; upon which I will under my topic and be able to create a sufficient amount of control independent variables. The testing variables I will be using in this model are both short-term and long-term interest rates. Upon the creation of my model, I ran an initial estimation and ran the following specification error tests: endogeneity, Ramsey's RESET test, autocorrelation, and normality. Once I was able to check for and correct any of these assumption violations, I ran my final estimation. After this, it was necessary to test for the stability of my model by inserting a binary variable in this model, which was whether recessionary periods impacted the effects monetary policy had on the inflation rate. After completing this test, I was able to come to a conclusion that I am fairly confident in, and have the resulting data and estimations to back up my beliefs.

The Effect of Sales Tax and Unemployment Rate on State Per-Capita Disposable Income. Dariusz Nowak, Oakland University

An economic indicator of the health of the economy, state per-capita disposable income, has many factors that contribute to its rise and fall. Focusing on the level of sales tax and unemployment rate of each state as the testing independent variables, a multi-regression will be computed. Along with the two testing variables, the urbanization rate, mortality rate, birth rate, median age, and the number of firms in each state will be added to the regression as control independent variables. After computing a regression, a binary variable will be added to the model to determine whether there is a difference in state per-capita disposable incomes between right to work states and forced-unionization states.

Healthy Aging in Older Adults: The Role of Childhood Circumstances and Lifecycle Factors. Nasim Baghban Ferdows, Gail A. Jensen, and Wassim Tarraf, Wayne State University

Objective. We examine the relationship between childhood circumstances, socio-demographics, health habits, and personal finances on healthy aging in older adults.

Methods. Focusing on 41,707 adults, ages 65 years and older, drawn from four pooled waves (2004–2010) of the Health and Retirement Study, we estimate a health production function for “healthy aging” as a function of childhood health and socioeconomic status, education, health habits, income, wealth, and health insurance. Healthy aging is defined as the absence of major disease and disabilities, and having high physical and cognitive functioning.

Results. Wealth is significantly associated with healthy aging (OR:1.12, p

Conclusions. Healthy aging depends on much more than how an individual lives today. Education and wealth accumulation are strongly associated with aging well in later life.

Fire in Detroit: Socio-Economic, Housing and Spatial Factors. Matthias Jung, Wayne State University

The relationship between socio-economic factors like income, race, or household composition and the risk of fire in an urban environment has long been of interest to researchers across disciplines. Previous literature finds that socially deprived individuals face a greater risk of fire than others. Additional studies find a positive correlation between the number of fires and the number of vacant structures. This paper examines whether socio-economic factors, various aspects of housing, and spatial features can explain differences in fire risk across neighborhoods in Detroit. To establish the theoretical relationship between firefighting service and utility gained by society, I apply Rawls’ “Theory of Justice”. It suggests that social welfare should be measured according to the least advantaged in society. If the risk of fire is greater for individuals in poor environments, then social well-being can be influenced directly through firefighting services. Secondly, I perform a spatial analysis regarding the occurrence of fires and their relation to other independent variables using GIS and kernel density mapping techniques. Finally, I employ spatial regression analysis to address the proposed research question. The entire analysis is based on the complete Detroit fire incidence dataset of the years 2008–2012.

Election Outcomes and State Government Performance: Evidence from US States. Oded Izraeli and Soo Sieber, Oakland University

This study is an attempt to shed light on the following important question: Does the voters’ choice of political leaders identified by party affiliation make a difference to the performance of their political entity? The political entity used for this study is the state. Several variables have been chosen to measure the performance of the state over a period of four years which is the full election cycle for the governor elected. We have grouped the different variables into the following areas: (1) economics, (2) social, and (3) government size.

Our empirical analysis indicates that the economics of states with unified government are growing faster, on the average, than those states with divided government. The regression results suggest that political variables have a weak influence on the level of the economic variables. The exception is the case of unified government under the Democrat party control that have positive influence on state employment per capita level and negative influence on the level of unemployment rates. Also, the stronger is the degree of competition between the two parties in the two chambers the lower is the unemployment rates. Unified government, especially if it is controlled by Democrats, helps to lower the level of poverty rates and a similar effect is found for the competition variable.

Demand for YouTube Video Content: An Analysis of Viewing Patterns around the World. Addington Coppin, Oakland University

This project analyzes YouTube data to investigate the global demand for a video lecture (by the author) on “The Arthur Lewis Two Sector Model of Development.” The data, culled from the “analytics” that YouTube provides to “content owners,” comprises daily viewership patterns for a period of approximately one and a half years. Six distinct peaks observed over three “traditional semester periods” appear indicative of a demand for the video lecture that peaks around mid-semester and again at the end of the semester. This pattern generally remains when the viewership data are decomposed into two “regions,” viz. North America and “Rest of the World” “ (accounting for 1/3 of the 4,300 views) and the “Rest of the World” (ROW) with a greater peak within each of the semester periods manifesting itself around the time the topic first appears within a traditional course in Economic Development (largely based on how the main textbooks in the field are organized). When the ROW data are further delineated into Europe, Asia and Other regions, the pattern for Asia appears to follow more closely that of North America, with both of these regions differing from the pattern observed for Europe. This casual observation is supported via a statistical analysis based on correlations and trends.

Can We Reduce the Income Inequality Gap by Providing Better Financial Education? Gerald R. Root, Leslie Bonn, Brenna Moher, and Andre Jacques, Lake Superior State University

Stock market participants have long been divided between the “smart money” and naive investors. Naive investors are characterized as those with short-term time horizons, who expect spectacular returns, and are easily discouraged when their unrealistic goals are not met. Advertisements and media encourage strategies that the smart money rarely, if ever, employ. When the strategies don’t work the naive investor believes the market is rigged! Better education is needed to transition naive market participation to smart money. Recent market volatility has created an opportunity to generate wealth quickly by buying near market

bottoms. Unfortunately, naive investors have had a tendency to sell at market lows, and perhaps even worse, remain out of the market as conditions improve. The result is greater income inequality. We investigate whether increased financial education at the undergraduate level can produce better understanding of financial markets, longer-term time horizons, greater tolerance for risk, and higher market participation rates. We hypothesize that it can.

Education

Why It's Time to be Done with Special Education. Phil Smith, Eastern Michigan University

Educators, researchers, and policy-makers have denied for decades what the data reveal is clear: special education has failed miserably and intentionally, to create change and remove barriers for people with disabilities in the United States. Revolutionary change in the structure and goals of what we call special education—indeed, in all of education—is essential. Students with disabilities drop out of school at high rates, end up in prison, rarely attend postsecondary education, and are at great risk for being institutionalized. Special education has failed to create positive employment outcomes for people with disabilities, who experience high rates of poverty, have poor access to appropriate health care, have poor social connections, and are more apt to experience abuse, neglect, and violence. After nearly 40 years of federal special education law, and a century of preparing teachers to work with students with disabilities, it is clear that special education is a failed project. A radical transformation of federal legislation is needed. Loopholes that prevent the full inclusion of students with disabilities must be backfilled. Funding structures must be realigned. Teacher preparation and educational leadership programs must be substantively transformed in order to move away from the entrenchment of educational silos and taxonomies.

The Federal Government's Usurpation of Local Control from Public Schools: A Historical Analysis of Politics, Law, and Reaction. Brett A. Geier, Western Michigan University

This paper provides a compendium of the educational system in colonial period and early American history, which amplifies the desire of the framers to delegate public education to the states. A synopsis of the post-civil war era in public education centered upon the *Plessey v. Ferguson* (1896) standard will be conducted concluding with its reversal in *Brown v. Board of Education* (1954). The majority of Federal involvement in public education begins with President Johnson's war on poverty. The creation of the Elementary and Secondary Education Act (ESEA), originally intended to assist poor students in reading, has become the leverage in modern times to reform education. The reforms witnessed since circa 1980 have drastically modified the manner in which the Federal

government has been involved in public education. Efforts such as A Nation at Risk, Goals 2000, NCLB, and Race to the Top will be reviewed.

Physical Activity and Student Achievement in Southeastern Michigan.

Nicole Murley and Kevin Hankinson, Madonna University

In order to promote student success on state assessments aligned to state standards, some school districts began to modify or replace non-core academic time (i.e., physical education and recess) with more core academic instructional minutes. Yet, some research has shown that these activities might actually improve academic achievement scores. This study analyzed whether the growing body of research has merit for a sample of public school second grade students in Southeastern Michigan.

The purpose of this study was to determine the relationship, if any, between duration of physical education and recess and student achievement. This study measured student achievement using assessment scores from the 2013–2014 Michigan Educational Assessment Program. These data were linked to the duration of physical education and recess for the assessed sample. To collect the latter data, researchers administered an online survey to public school administrators.

The explanatory variables, duration of physical education and duration of recess per week, were analyzed with percent proficiency by school in both mathematics and reading. When selected demographic variables were controlled, researchers found a weak, negative association between minutes of physical education and recess and percent proficiency in mathematics. This finding contradicts previous findings and may have implications for school administrators.

Education at the Margins. Michael Peacock, Eastern Michigan University

In this presentation I will explore the possibility of applying current theories in psychology and education to create an educational setting to meet the needs of marginalized students. Gifted students may underachieve or drop out “with dignity” (Reis and McCoach, 2000); students who receive special education services and supports may be isolated from their peers (Smith, 2009); students living in impoverished communities may not be safe in dilapidated schools in areas rife with crime (Kozol, 2012); students who have experienced trauma may feel disconnected from peers and the act of learning (Wingo et al, 2010); students whose family members (or themselves) have been incarcerated may face serious challenges as well (Wakefield and Wildeman, 2011). Third wave resilience theory offers insight into what educators and others in the helping professions can do to support children as they mature and integrate into society as citizens (Richardson, 2002). Evolutionary psychology offers insight into the nature of play and its importance in the development of higher order thinking and socialization

skills (Gray, 2011). Non-traditional educational settings are diverse in their student composition, pedagogical approach, scale, and organization (Neill, 1960; Kozol, 1972; Gray & Chanoff, 1986; Meier, 2003; Knoester, 2012).

Participatory Perspectives: A Photovoice Narrative Study of Zambian Vulnerable Youth. Lori Imasiku, Andrews University

This paper is an exploration of the educational experiences of Zambian vulnerable youth. In an attempt to meet the education objectives outlined in the United Nations' Millennium Development Goals, Zambia's Ministry of Education has implemented many revisions within the education system. The Free Basic Education Policy resulted in a sizable increase in enrollment and attendance across the nation and allowed access to education for many of Zambia's youth (Republic of Zambia Ministry of Education, 2006). While the efforts to increase school enrollment have been successful, some of the nation's most vulnerable youth may still be lacking opportunities to attain access to quality education. For this study, twelve students from the Kalingalinga community in Lusaka, Zambia were selected to share their educational experiences through a participatory research model. All twelve students produced an educational narrative along with suggestions on how the educational system could be improved to better serve Zambia's most vulnerable youth. Seven of the twelve also contributed to the research through a photovoice project in which they documented their school and community and how the many facets of their lives played positive and negative roles in their education.

Reference

Republic of Zambia Ministry of Education. (2006). Educational Statistical Bulletin. Lusaka: Ministry of Education.

Who Needs Goals: An Analog Experiment Comparing Goal-Free Evaluation and Goal-Based Evaluation Utility. Alayna Zielinski and Brandon Youker, Grand Valley State University

Systematic research on evaluation can greatly improve a program but in making informed decisions about which evaluation model to choose, there needs to be adequate research literature on the evaluation types. One nearly unexamined type of evaluation is goal-free evaluation (GFE). GFE is designed to keep evaluators purposefully ignorant of the program's stated goals and objectives. The idea behind GFE is that the evaluator may uncover unintended side effects, or additional goals, which would have gone unnoticed looking solely for specific goals and objectives. In this analog experiment, GFE is compared with goal-based evaluation (GBE). GFE and a GBE were simultaneously and independently used to evaluate the same training program. After reading each of the evaluation reports, thirty evaluation users completed a semantic differential questionnaire to assess their attitudes toward the utility of each

report and then participated in a follow-up focus group. The conclusion of the study was that there is no significant difference in evaluation utility between GBE and GFE. By finding that GFE has similar utility to GBE—a method which is commonly regarded—there is evidence for further use and research on GFE.

Eliminating the Achievement Gap: The African American Young Men of Promise Initiative. Theresa Saunders, Eastern Michigan University

African American young men are the lowest performing academic group of students in over 800 Michigan schools. As a result, the Michigan Department of Education launched a pilot program designed to better understand the issues, develop innovative and effective strategies to address them and significantly improve the academic performance of these young men. Significant to the pilot are the resources being used to address the issues in the various schools and districts. This presentation will explore the use of revenues and expenditures and their relationship to improved student achievement in participating schools.

An Examination of Blended/Hybrid Instructional Formats in Education System: A Follow-Up Study. Yvonne Callaway, Sue Stickel, and Bo Jun Young, Eastern Michigan University

A frequent concern among graduate students and faculty is that instruction delivered online presents challenges for teaching and learning. This concern is not only affecting students and instructors of higher education, but also students and instructors of K–12 school systems with the increased percentage of online courses offered. Online learning is categorized in these following forms: web enhanced, blended/hybrid, and online. Studies have shown that blended instruction method, which combines online and face-to-face elements, had an advantage relative to traditional face-to-face or online instruction. This study continues work from 2012 to learn more about the perceptions and experiences of graduate counseling students taking courses in a blended format. The study focuses on students' perceptions of the quality of the learning experience in blended settings, and examines the trends identified in the first study. Also, it utilizes a multi-method approach to data collection and analysis incorporating qualitative methodology and a grounded theory design in an effort to better explain students' meaning attribution about learning in the blended environment. Knowing more about student experiences will support continued program and instructional development and modification for graduate education.

ROP in the Classroom. Gabrielle Kwalton

Retinopathy of Prematurity (ROP), an eye disease found in infants born before 31 weeks gestation age and weighing less than 2 $\frac{3}{4}$ pounds is one of the most common causes of blindness in children. ROP is a spectrum disorder that ranges from the development of normal vision without treatment in earlier stages to

total blindness in the later stages. Limited research has been conducted on ROP and the long term treatment results. In this presentation, the emphasis is on the educational aspect of students with ROP such as the various resources implemented in developmenting student's education.

Effective Ways of Establishing and Managing Endowment for Higher Educational Institutions: The Importance of Endowment for Small Universities. Protas Aloys Makimu, Andrews University

Endowment funds are permanent, self-sustaining funding. Only the portion of interest from the fund can be spent, not the principal, and sometimes donors may impose restrictions for certain periods. Endowments are useful for student scholarships, and excellence for research projects. The study observed how to approach potential donors with positive narrative not weakness, emphasizing what the gifts can support to make a difference in the life of people and not needs of money. Raising funds for endowments can be harder than other types of fund raising because donors would like to know why they have to give to endowments as opposed to giving directly to various projects to see their dollars used right away for services. However, endowments ensure philanthropists that an organization will be around in the future to carry out its mission. The study highlighted how to establish and manage true, term, and quasi endowments by implementing governing policies. It also pointed out their advantages and why it is vital to establish endowments for small institutions. The contemporary way of endowing is exacerbating the inequality gap between the most affluent students who attend the elite schools and the middle, and poor ones who mostly enroll in less prestigious institutions.

The Demographic Antecedents of Reading and Math MME and ACT Scores: Their Impact in Kent ISD Schools. Roger Wilson, Grand Valley State University

One of the functions of the 2001 federal No Child Left Behind legislation was to require the public reporting of disaggregated student test data from state standardized tests. In Michigan that was the MEAP initially, and as of 2007, also its replacement at the high school level by the MME. It was this disaggregation and public reporting requirement that was intended to leave no child behind since schools and districts would be identified as to their success with test achievement for the various student subgroups, something that was masked by the past practice of aggregating and averaging all student data. Pre-NCLB, the performance of White middle class students tended to skew school and district test results, or certainly, failed to provide a fuller picture of student success or lack thereof. With NCLB, all that changed. Districts had to report out results for each demographic category (e.g., gender, race, economically disadvantaged, ELL, and so forth). This presentation will examine the disaggregated MME and ACT data for the high schools of the approximately 20 districts of Kent ISD, an area that might be referred to as "greater" Grand Rapids and that includes surrounding communities.

Academic Experiences of Brazilian International Students. Ellen Rodrigues, Andrews University

Overall, educational research on international students usually attempts to understand the challenges and adaptations they face in entering a new educational system. These studies are normally concerned with international students' perception of the quality and relevancy of academic programs in the United States. Yet few studies explore the experiences of these students. Thus, the present study endeavors to understand Brazilian international students' academic learning experiences of new models of teaching and learning. By using a phenomenological approach, the researcher interviewed three participants about the meaning they ascribe to their academic experiences in a new graduate program. Findings indicate that students feel disempowered as they experience a self that is not able to communicate successfully. In turn, students cope with limitations in language skills by focusing on metacognitive strategies. Also, participants describe different models of teaching and learning: the Brazilian model centers on the transmission of knowledge while the North-American model heavily focuses on learning outside the classroom through readings and assignments. Participants admire a classroom and instruction that stimulates them to think, as is the case in their international experience, but at the same time, they expect professors to develop more ability to transmit knowledge and control discussions like in their home country.

How Does Auditory-Verbal Therapy Compare to Therapy in Public Schools? Aisha Darnell, Eastern Michigan University

The efficacy of Auditory-Verbal Therapy[®] (AVT) has been proven over the years. This type of therapy focuses on teaching children to learn how to speak through listening. The therapist's job is to give parents the tools and techniques during therapy sessions so that they will be able to replicate the therapy in the home setting. It has been recorded that this therapy has improved the lives of families with children with hearing impairments. However, AVT is expensive and is not available to some children who would benefit from it. For those children that do not have access to AVT they receive therapy by a certified teacher of the deaf in public schools. The purpose of this study is to compare the speech and language therapy implemented by a certified Auditory- Verbal Therapist (AVT) to a certified teacher of the deaf in the public schools.

Pirating the Caribbean Mind: Curriculum Theorizing in the (Post)Colonial Eras. Larry D. Burton and Anneris Coria-Navia, Andrews University

In this paper we reflect on the impact of colonial and postcolonial experiences in the twentieth century on peoples of the Caribbean basin. The paper begins with a discussion of ideologies, epistemologies, and hegemonies which underlie imperialist actions and postcolonial thought. We then highlight educational and

social practices and institutions shaped by colonial and postcolonial realities. These include schooling, access to services, social values and norms, and culture. These introductory sections set us up to explore how colonial and postcolonial actions have “pirated the mind” of Caribbean citizens. Included in this section is a presentation of the appropriation of uniquely Caribbean theoretical constructs by other cultures in the name of “globality.” Globality argues that the entire world is now post-postcolonial due to technological advances which allow sharing of knowledge in both directions between more developed and less developed nations. The paper attempts to uncover multiple perspectives of colonial and postcolonial thought by taking at various times the perspective of the oppressed, the oppressor, and the overlooked. These varied perspectives enable us to investigate how postcolonial realities impact persons in each of these groups. We conclude the paper with implications for North American educators.

Design Considerations to Create Autistic Friendly Classroom. Nadia Arafah, Eastern Michigan University

This research explores the role of interior design in enhancing the learning experience for autistic children, since they suffer from deficiencies in basic areas of development such as learning and interacting with others, in addition to sensory sensitivity. This study aims to gain understanding of the learning patterns and behavioral issues of autistic children and provide solutions in the classroom to create an ideal learning environment. It was hypothesized that designing an autistic-friendly learning environment will increase the learning development for children with autism spectrum disorder. The methodology of this study is based on observing autistic children’s behavior and academic performance in the classroom, interviewing teachers who are in direct contact with autistic children and evaluating the current classroom condition. This resulted in creating an ideal integrated classroom for autistic children by suggesting general interior design solutions which enhance their learning development.

Academic Libraries in the Know: Digital Online Resources for Children’s Literature. Anne W. Merkle, Grand Valley State University

Where can I go to find online children’s books? How do I access them? What comprises the databases and applications? How might I assist students with using these in a classroom? A creative report on databases and apps that may be used effectively in the elementary school classroom and with pre-service teachers.

Teacher Perceptions on the Common Core State Standards in Mathematics. Vicki-Lynn Holmes, Jane Finn, and Jake Verschueren, Hope College

In June 2010, Michigan adopted the newly released Common Core State Standards in mathematics. In October 2013, the house and the senate officially approved the initiative for statewide implementation. According to the state of

Michigan “these standards improve upon Michigan’s current standards (the Grade Level Content Expectations and the High School Content Expectations) by establishing clear and consistent goals for learning, and allowing Michigan to work collaboratively with other states to provide curricular support to schools and educators.” To learn more about secondary mathematics teachers’ views of the mathematics standards and their preparedness in putting them into practice, Michigan Council of Teachers of Mathematics in conjunction with Hope College surveyed 100 secondary math teachers after participating in a 3-day Common Core-related conference. Results showed that most teachers felt familiar with what was expected of them, but felt they needed particular examples of how to apply the standards in their algebra and geometry classes. These secondary teachers felt their curricular materials were not aligned with the CCSS, and more targeted preparation was necessary. The student populations causing most concern were ESL and special education students. Recommendations and ways to address secondary teacher concerns are reviewed in this session.

Is There ‘Beef’ in Teacher Education Programs? Barbara Lubic and Marty Abramson, Grand Valley State University

Considerable criticism has been leveled at teachers for the poor academic performance of students in classrooms. Arguably, teacher education programs, for the most part, have escaped these criticisms. Yet, one of the largest determinants of student success is the competency of the teacher. Those who are in teacher education have considerable control of the variables that control the quality of those who exit our programs. We control entry criteria, the content of our programs, the determinants of success and failure within our courses and programs, and whether those who enter our programs have attained a sufficient level of content and skills necessary to affect the academic and social behaviors of students in classrooms. Is it time to begin thinking about moving from a model of teacher preparation, in which minimal competency is the standard, to one in which excellence and mastery are required? To be discussed are issues involving entrance requirements, difficulty of coursework, what constitutes mastery, and whether the current bar is set too low for completing teacher education programs.

The Impact of Teen Health Education Programs on Student Perceptions and Health Behaviors. Lina Jawad, University of Michigan-Dearborn

Community centers are sites where one form of public pedagogy takes place. The purpose of this study was to identify the impact of one health education program offered at a local community center on the participants enrolled. My unit of analysis was the “Teen Health” unit and its discussion sessions that targeted physical, mental and emotional teen health such as smoking, nutrition and self-image, building healthy relationships, and domestic violence. This study is grounded in research based on the Health Belief Model (HBM) which is used as a predictor for human health behaviors and on Bandura’s self-efficacy theory

which influences people's behavioral choices, their effort, persistence and coping mechanisms. A person is willing to change his or her health behavior based on the person's perceived susceptibility, perceived severity, perceived benefits and perceived barriers for the health behavior. I worked as a tutor at the site while collecting my data. After offering health education sessions that prompted discussions to understand teen perceptions of health, I followed up with interviews of teens and focus groups with staff to provide triangulation of data. This study proves that community centers, as places that offer education outside schools, can equally improve the lives of teens enrolled.

Making the Case for Support of Library Services and Elective Courses in ever-Tightening K–12 School Budgets. Susan Miko, Toledo Sister Cities International

Those involved in library services at the K–12 level have faced ongoing issues of diminishing financial support for school libraries for several years. The outlook does not seem to be improving as federal, state, and local tax support of education continues to lag. Complicating the needed support for school libraries is competition for the same scarce dollars by courses often referred to as “specials” at elementary schools and “electives” at secondary schools. Left to compete for limited dollars are courses outside the “big four” of math, science, language arts, and social studies. They include art, music; vocational subjects of family/consumer resources, applied technology and business; and foreign languages electives with low enrollments. So how do school librarians “make their case” to retain staff—or even keep their libraries open—to school superintendents or others who control the purse strings? Varying options are available, ranging from purely emotional to highly data driven. A “one size fits all” approach does not necessarily work well; rather, the investment of time in analyzing what best meets student, school, and community needs, coupled with innovative ideas on making school libraries highly relevant will be discussed by a former school librarian who then served as a school superintendent for more than a decade. These same approaches are applicable to any of the subject areas which face stiff competition for survival in these tough economic times.

The Over-Representation of Individuals with Intellectual and Developmental Disabilities in the Criminal Justice System: A Closer Examination. Kelli Bracken, Eastern Michigan University

This project focuses on the unique experiences of individuals with intellectual and developmental disabilities in the criminal justice system. Research demonstrates that up to 30% of people in prison systems have intellectual or developmental disabilities; this over-representation of individuals with intellectual and developmental disabilities in prison systems is a complex problem that warrants further investigation. By examining the legal system and the role of its representatives (including police, attorneys, and judges), this study strives to

uncover the reasons behind this vast over-representation including stigma and a general lack of awareness. A close inspection of current police curriculum exposes lackluster mandatory training for Michigan's police officers. Finally, implications are discussed for proactive educators/special educators.

Computer Competencies Required by Home Economics Lecturers for Teaching in Tertiary Institutions in South East Nigeria. Ngozi Priscilla Owoh, Enugu State College of Education (Technical), Enugu

This study identified the computer competencies required by Home Economics lecturers for e-learning in tertiary institutions in South East Nigeria. The purposes of the study were to identify the computer competencies required in operating basic computer operations and using power point to create presentations. The population for the study was made up of 169 lecturers. A structured questionnaire was used to collect information from the respondents. The instrument was face validated by 5 experts. The internal consistency of the instrument was computed using cronbach alpha and a reliability co-efficient of 0.87 was obtained. Data were analyzed using mean and standard deviation. The analysis of data revealed that a total of 25 computer competencies were identified to be required by the Home Economics students and lecturers for e-learning in tertiary institutions in south east Nigeria.

Children with Autism Spectrum Disorder and the Ability to Learn and Generalize. Hajar Almutlaq, Zuzanna Tomas, and Sally Burton-Hoyle, Eastern Michigan University

This paper explores the variety of possibilities regarding emotion in children with Autism Spectrum Disorder (ASD), especially their ability to communicate and use their emotions, either through gestures or facial expressions. This paper also examines current literature on the relationship between the prediction of a child's success and his or her actual ability to communicate. Finally, it analyzes the ability of children with ASD to learn how to understand emotions and generalize the outcome of learning processes to maintain a normal life. This paper finds that children with ASD are able to learn how to understand emotions and generalize the outcome in normal life.

Living at the Friendship House: Findings from the Transition Planning Inventory. Jane Finn, Vicki Lynn Holmes, Meg Ahlgrim, Michael Henriksen, and Kristen Slotman, Hope College

The federal law entitled Individuals with Disabilities Education Act (IDEA) requires working on transition outcomes that will help individuals with cognitive impairments (and other disabilities) move smoothly to post-secondary life. However, research has shown that these individuals lack the appropriate skills to live independently. To help with this endeavor, a living establishment named the

Friendship House was established. This unique living arrangement is where students without disabilities live alongside people with cognitive impairments. To research if the Friendship House has helped with transition skills, an assessment instrument for identifying and planning for the comprehensive needs for individuals with disabilities called the Transition Planning Inventory (TPI) was given to (a) roommates without disabilities, (b) roommates with cognitive impairments, and (c) parents of the roommates with cognitive impairments. Descriptive statistics along with a Bivariate Linear Regression Model were calculated in the areas of employment, further education/training, daily living, leisure activities, community participation, health, self-determination, communication, and interpersonal relationships. The results gleaned from this research will help determine and identify critical transition planning areas for the roommates with disabilities.

The Implementation Degree of the National Teacher Professional Standards in Mathematics, Science, and Technology Curricula from Pre-Service Teachers' Perspectives. Hala Alshawa, University of Jordan

The aim of this study is to investigate the implementation degree of the National Teacher Professional Standards in mathematics, science, and technology curricula offered by the University of Jordan from pre-service teachers' perspectives. A questionnaire was developed by the researcher with 36 items. It consisted of five dimensions: (1) academic and pedagogical knowledge, (2) planning for instruction, (3) implementation of instruction, (4) assessment of students' learning and instruction, and (5) self-development. The questionnaire was collected from 370 pre-service teachers (182 pre-service kindergarten teachers and 188 pre-service elementary teachers). The findings indicated the implementation degree of the National Teacher Professional Standards in mathematics, science, and technology curricula from pre-service teachers' perspectives in Jordan was medium. There were no significant differences between students' perspectives with respect to the specialization area but there were significant differences with respect to the curricula. Students think the implementation degree of the standards in Mathematics curricula was the highest among the three subjects, while the implementation degree of the standards in technology curricula was the lowest. The researcher recommended reviewing mathematics, science, and technology curricula at the university level.

Exploring the Effectiveness of the OLES in Assessing University Students' Perceptions of Their Online Science Courses. Brandy Skjold and Christopher Duchesneau, Western Michigan University

Classroom learning environments are being supplemented or replaced by online learning environments. Previous research has shown that student outcomes are likely to increase when their actual learning environment closely resembles their preferred learning environment. Validated instruments exist that

can be used to explore student perceptions of online learning environments. Science courses produce unique challenges when offered in an online format as they are characterized as having hands-on laboratory components and activities. An evaluation and assessment study of the Online Learning Environment Survey (OLES) was conducted to determine if this instrument can be effectively used to explore students' perceptions of completely online science courses at the university level. The OLES was administered to students and follow-up interviews were conducted. Interviews were analyzed based on existing OLES statement blocks and then compared between students. Analysis reveals that student scores on the OLES are not always indicative of what they would prefer to experience in their online science courses and that interpretation of OLES statements varies between students and between the students and the researcher. We suggest that the OLES statements be modified or additional blocks of statements be developed before this survey instrument can be used to effectively explore this unique population.

A Descriptive Look into the Influence of Task Types on Student Discussions during Small Group Work. Katherine Eaton, Western Michigan University

The goal for this session is to disseminate results from a pilot study that investigated how task types influence peer-to-peer interactions during group work in a chemistry classroom. To analyze the data collected during this study, a descriptive, narrative intention provided a snapshot of what talk occurred and how peer interactions impacted conceptual understanding throughout the lessons. Forrester (1991) makes an essential point about the descriptive nature of research when discussing talk dynamics: "There is a very important sense in which participants themselves produce the learning opportunities in conversations." To gain insight into how conceptual ideas developed during everyday classroom interactions without an instructional treatment, student discussions throughout four task types were recorded and analyzed. An a priori coding scheme developed by Asterhan and Schwartz (2009) provided the lens for coding talk turns in the transcripts. The rank order of coding occurrences was determined for each node by individual and task. This strategy depicted how students were participating in the group conversations and what type of talk was most prevalent. The data gathered during the study established that task selection and design are mediating factors when planning for small group work and eliciting productive student talk.

Graduate Students' Perceived Readiness to Prevent Suicide: Implications for Suicide Prevention in Campus Communities. Michael G. MacDonald, Brian Wummel, Lisa Hawley, Erica Wallace, and Patricia Wren, Oakland University

The present study examined graduate students' perceptions about their ability to prevent suicide and their knowledge for suicide information as part of a comprehensive needs assessment designed to guide a campus suicide prevention

effort. One hundred and eight college students ($M_{age} = 33.6$ yrs; 85 females, 23 males) responded to the Suicide Prevention Exposure, Awareness, and Knowledge Survey (SAMHSA, 2006) to evaluate knowledge for suicide information and perceived readiness to engage in suicide prevention work. Correlational analyses revealed that knowledge scores were significantly ($p < 0.01$) related to self-ratings of skills and dispositions relating to helping someone who is suicidal. These perceptions included self-ratings of competence, comfort level, ability to recognize warning signs, how to ask someone about suicide, and knowledge for facts about suicide prevention. Counseling majors' knowledge for suicide information, perceived knowledge items, and perceived suicide intervention skills were significantly higher ($p < 0.02$) than those of other graduate students. Females' perceived knowledge for select items was also significantly higher ($p < 0.01$) than males, which suggest a partial interaction effect between college major and biological sex for suicide intervention readiness. Implications for suicide prevention programming on college campuses are discussed with particular reference to the needs of graduate students given their higher suicide risk status.

Engineering

Teaching Aid Using Folding Line Theory to Create Auxiliary Views.
Slobodan Urdarevik, Western Michigan University

When six standard orthographic views are not sufficient to show the true size of an inclined surface of an object, an auxiliary view has to be created to draw the true size of an inclined surface. Teaching this technique from a text book is hard for students to understand, particularly how to create an auxiliary view of an object by imagining that the part is inside a glass box. In using folding line theory students have difficulties understanding: (1) where to draw the line between the principal projection planes; (2) where to draw the folding line between a principal projection plane and primary auxiliary plane; and most importantly (3) how to transfer the height from the base of an object and the folding line between the two principal projection planes to an auxiliary view. I have created a teaching aid that helps students to practically see all three critical components and clearly understand steps in creating an auxiliary view using Folding Line Theory. The results of using the teaching aid in my Engineering Graphics classes are incomparable to those teaching auxiliary views from textbooks.

Stress-Relaxation Cycles and Their Effect on the Capacitance of Dielectric Electro Active Polymers. Boon Chai Ng, Andrews University, Cody Rieger, Andrews University

Dielectric Electro Active Polymers, DEAP, is a silicone dielectric film material coated, on its corrugated surface, with a very thin layer of metallic electrodes.

These materials allow large mechanical deformations with low operating forces, making them suitable for consideration as a potential medium for converting mechanical energy into useful electrical energy. Samples of 80% strain DEAP, provided by Danfoss Polymer, were subjected to 6,000 and 10,000 stress relaxation cycles. The capacitance was recorded at 1,000 stress cycle intervals. Microstructural images of the stressed samples were obtained to evaluate the changes on the metallic electrodes layers and how these changes will affect the capacitance of the DEAP. This work examined the capacitance to provide useful information in optimizing the electrical properties for specific applications, and to investigate how the electrical properties are affected by electrical and/or mechanical breakdown of these materials

Surface Grafting of Biocompatible Polymers Via Atmospheric Pressure Plasma for Improved Wear Resistance. Susan Farhat, Cheryl Samaniego, Ali Zand, Mary Gilliam, Michael Magyar, Nathan Dwarshuis, and La'Shyla Nelson, Kettering University

Atmospheric pressure plasma treatment was used to attach various biocompatible polymers to a high molecular weight polyethylene (HMWPE) surface, thereby providing a lubricating, hydrophilic surface to improve wear resistance for use in prosthetic applications. Bio-compatible polymers, such as poly(2-hydroxyethylmethacrylate), polyethylenimine, and polyethylene glycol, were chosen for this study. Low temperature, atmospheric pressure plasma was used, along with an in-house constructed spray delivery system, to coat high density HMWPE substrates. The surface chemistry, adhesion of the coatings, and contact angle of the coating surfaces were characterized and presented previously. The focus of this work centers on the biocompatibility and wear resistance of the coatings. The biocompatibility of the surface was characterized using cell proliferation studies in mouse embryonic fibroblasts. The wear properties of the coatings were determined by weight loss under conditions of a random motion pin-on-plate apparatus with the coated polyethylene plaques immersed in serum albumin solution. The results indicate that the biocompatible polymer coatings on HMWPE surfaces may improve the performance and longevity of these surfaces when used in biomedical applications such as orthopedic implants and implanted medical devices.

Mathematical Models of Protein Interactions in the QCM-D Biosensor for Fractal Surfaces. Hyun Kwon and Robert Polski, Andrews University

Fractals, defined as infinitely complex patterns that repeat themselves at different scales, are considered how nature forms complex yet ordered geometry. However, bio-interaction models have been modeled in a simple Euclidian simplified geometry for years although the sensor geometry and surface often features higher complexity. This discrepancy has caused inconsistency of modeling from actual reactions. In this paper, protein interaction under the

influence of flow is modeled and simulated with and without assumptions of fractal sensor surface. A coupled fluid and reaction-transport model in the QCM disk-like fluid chamber was simulated for interaction between calmodulin and calcineurin as a model system. The differential equations were solved using the COMSOL MultiphysicsTM. The simulation results were compared to the experimental data. The fractal surface assumption provided 20–30% improved results in predicting effects of flow rate and reaction kinetics on the binding. The results demonstrated that employing more realistic geometric features such as fractal surfaces to the mathematical modeling enables better prediction of the flow-driven bio-interactions.

Synthesis of Reduced Graphene Oxide Using Atmospheric Plasma and Furnace Annealing. Yigang Tong, Ryan Ayler, Uma Ramabadran, Xuan Zhou, Gillian Ryan, and Susan Farhat, Kettering University

Graphene oxide (GO) is an electrical insulator with good mechanical and thermal properties. It exhibits increased conductivity when the Carbon to Oxygen ratio is high. Our work aims to efficiently fabricate inexpensive flexible reduced graphene oxide films for use as supercapacitor electrodes. For this purpose, an aqueous mixture of GO in polyvinyl alcohol (PVA) was coated on aluminum foil. The air-dried films were then subjected to one of two different annealing processes which would burn the polymer; atmospheric plasma annealing in a nitrogen atmosphere and furnace annealing in an argon atmosphere. The films were characterized using Fourier Transform Infrared Spectroscopy (FTIR), X-ray diffraction, and Environmental Scanning Electron Microscopy (ESEM). FTIR data indicate that annealing at elevated temperatures of 600°C will reduce the OH absorption signature at 3320 cm^{-1} , demonstrating a reduction in oxygen content. X-ray diffraction data correlate this result with a characteristic RGO signature. In addition, the ESEM results indicate that the carbon to oxygen ratio was substantially increased for the annealed samples. The results suggest that atmospheric plasma annealing in a nitrogen atmosphere could be used as a fast reliable method to transform GO to RGO.

Polymer Coatings Using Atmospheric Pressure Plasma for Biomedical Applications. Susan Farhat, Cheryl Samaniego, Ali Zand, Mary Gilliam, Michael Magyar, Nathan Dwarshuis, and La'Shyla Nelson, Kettering University

Surface modifications resulting in functional coatings on varying substrates are useful for a wide range of biomedical applications—including medical devices and implants, tissue engineering, and drug delivery. Currently, our research team is investigating the use of atmospheric pressure plasma treatment to modify the surface of high molecular weight polyethylene by surface grafting various polymers. The resulting grafted surfaces have specific functionalities and ultimately improved properties, targeted at two different applications. The focus

of the first project is using plasma to attach various biocompatible polymers to polyethylene, thereby providing a lubricating, hydrophilic surface to improve wear resistance for use in prosthetic applications. The second project is aimed at investigating the viability of using plasma to create highly crosslinked polymer coatings to be used for timed drug release systems. Characterization of the functionalized surfaces includes common spectral methods like Fourier transform infrared spectroscopy (FT-IR), as well as application-specific analysis like contact angle, cell proliferation, and rate of diffusion measurement. This poster will highlight the methodology, characterization, and current results from each of these projects.

Physical Properties of Meteorites. Mason Molesky, Emma Patmore, and Melissa Strait, Alma College; George Flynn, State University of New York-Plattsburgh; Dan Durda, Southwest Research Institute

Asteroid studies have been conducted in this lab for years using meteorites as analogs. Little is known about the physical characteristics of meteorites; thus studying these characteristics has become a focus of this lab. Three different physical properties are being measured that may give insight into the behavior of materials as they disrupt: (1) the speed of sound, (2) the density, and (3) the compression strength. Speed of sound through the materials was tested by cutting smooth ends on a sample and then sending sound waves through the sample, recording the time. The density of the sample was tested using the classic Archimedean method. A known volume of sample is submerged into a known volume of liquid. Then the change in volume of the liquid determines the volume of the sample. Compression strength was determined by placing a sample underneath a container and slowly adding water until the sample reached its breaking point. The mass of the water was used to calculate the compression strength. Current tests on terrestrial materials and future tests on meteorites will allow the lab to determine physical properties that can be extrapolated to asteroids, which will be useful for future analysis of asteroid disruption characteristics.

Environmental Science & Ecology

The Effect of Hypoxia in Crayfish, *Orconectes rusticus*. Miranda L. Strasburg and Arthur L. Martin Jr., Saginaw Valley State University

Many different aquatic species exhibit changes in behavior when exposed to hypoxic waters. Crayfish are a highly diverse species that are found in a variety of waters both hypoxic and normoxic. Crayfish experience adverse physiological effects in hypoxic waters, but it is unknown if crayfish exhibit a preference to areas with higher oxygen concentrations. The purpose of this study was to analyze the responses of the crayfish, *Orconectes rusticus*, when exposed to varying levels

of oxygen. Each animal was placed in a y-maze (working section: $30.5 \times 61 \times 30.5$ cm, arms: $30.5 \times 43 \times 30.5$ cm) with each arm containing water of different oxygen concentrations, ranging from 2 to 8 mg O_2/l . A current of 25 cm/sec was streamed through each arm of the y-maze. After each set of initial trials, data were analyzed based on initial arm choice, time spent in each arm, and time spent at the furthest upstream position. This allowed us to determine if *Orconectes rusticus* exhibits an oxygen preference, thus demonstrating its potential habitat selection based on a range of oxygen levels.

Climate Change Mitigation through Dietary Choices. Alfredo Mejia, Andrews University; Samuel Soret, Michael Batech, Karen Jaceldo-Siegl, Joan Sabate, and Helen Harwatt, Loma Linda University

Background: As greenhouse gas emissions (GHGEs) increase in the atmosphere, concerns about climate change grow. The general public is advised to recycle packaging and use energy efficient appliances and vehicles, but little emphasis is given to mitigating climate change through dietary choices.

Objective: The purpose of this presentation is to compare the GHGEs generated in Carbon Dioxide equivalents (CO_2 eq) by different dietary patterns.

Methods: The GHGEs of 202 foods were calculated using life cycle assessment and relevant literature. CO_2 eq emissions were then estimated for different dietary patterns from a sample of 98,000 people based in North America.

Results: The CO_2 eq generated per day for non-vegetarian, semi-vegetarian, and vegetarian dietary patterns, respectively, were 3.0 kg, 2.4 kg, and 2.2 kg.

Conclusion: Our findings show that dietary choices can be an effective strategy to lower GHGEs and mitigate climate change. For example, switching from a non-vegetarian to a vegetarian diet in North America can potentially save 292 kg of CO_2 eq per person per year. When considered at a population level, even modest savings in GHGEs can have a significant impact on climate change.

Seasonal Variation in Diet of Pleistocene Ground Squirrels Inferred from $\delta^{13}C$ of Incisor Enamel. Luke Kang and H. Thomas Goodwin, Andrews University

The proportion of C4 versus C3 plants in ecosystems varies directly with temperature, with C4 plants more diverse and productive at lower latitudes and elevations, as well as in warmer seasons. Since C3 and C4 plants fractionate ^{13}C differently (reflected in differences in $\delta^{13}C$), it is possible to infer their abundance in $\delta^{13}C$ of herbivore enamel. Here, we utilized laser ablation to serially sample $\delta^{13}C$ along the length of incisors of Wyoming Ground Squirrels (*Urocitellus elegans*) from a high-elevation Pleistocene site (~2,900 m) in Colorado (Porcupine Cave). Because many fossils had a hibernation mark, and based on published annual cycle data on extant Wyoming ground squirrels, we were able to

place many $\delta^{13}\text{C}$ samples into time of year. All fossils with a hibernation mark displayed reduced $\delta^{13}\text{C}$ during hibernation, as expected (squirrels metabolized isotopically depleted fat during hibernation). However, our data suggest greater usage of C4 plants during spring (higher $\delta^{13}\text{C}$) than in summer (lower $\delta^{13}\text{C}$), contrary to our expectations.

DNA Fingerprinting of Michigan Emerald Ash Borers (*Agrilus planipennis*). Jeremy Schultz, Saginaw Valley State University

The Emerald ash borer is native to northeast Asia but was found in Michigan in 2002. It had most likely been transported in infested pallets. In the last twelve years it has spread throughout the Great Lakes region and to much of the eastern United States. The larvae feed on vascular tissue in many species of ash and already have been responsible for the destruction of at least thirty million trees in Michigan. They have had a significant impact both ecologically and economically. Samples were collected from four locations in Michigan. Specimens were frozen at -20°C or stored in a 70% ethanol solution until DNA extraction was performed on leg tissue using a DNeasy extraction kit. DNA fingerprinting was performed using PCR and capillary electrophoresis. Data analysis included determination of the number of alleles per locus, allele frequencies, observed (H_o) and expected (H_e) heterozygosities, Hardy Weinberg equilibrium (HWE), genetic distance (D) and population substructure (FST). Genetic distances between populations were found to be low and population substructure was also low. The results indicate that only a portion of the genetic variation present in native populations has been transported to Michigan.

Factors Influencing Shelter Preference in the Rusty Crayfish. Taylor M. Rupp and Arthur L. Martin III, Saginaw Valley State University

Animals are frequently confronted with threats of predation and aggressive competition. One method that animals use for protection against these stresses is to seek cover within shelters. In the literature, many animals have been shown to exhibit preferences for certain types of shelters. It has been demonstrated that populations of crayfish competing in the presence of variable shelters display preferences for shelters with different numbers of openings based on their social ranking. However, the factors which influence preferential selection of shelters in crayfish are not well understood. This study will analyze crayfish shelter preference in the absence of environmental pressures as well as in the presence of predators or conspecifics. In one half of a divided tank, an individual crayfish was presented with a series of four shelters with one, two, three, and four openings. A fish (predator), another crayfish (competitor), or no animal (no threat) was then placed in the other half of the tank behind a mesh divider. This allowed the crayfish to receive visual and chemical cues from the other animal without the possibility of being physically attacked. This study will provide important

information on the dynamic between environmental factors and resource selection.

Closing the Gap between the “Known” and the “Unknown” among Potential Consumers of Green Roof Systems. Joanne M. Westphal, John Schweitzer, and Jeffrey Andresen, Michigan State University

In this presentation, the authors discuss the use of Diffusion Theory and results from a statewide survey to conceptualize a strategy to increase public knowledge about green roof systems. In an earlier survey of 947 households in Michigan, respondents perceived that the single greatest barrier to green roof adoption in Michigan was “a lack of consumer information on the product”. Other results indicated that only 9.1% of those surveyed said they knew “a lot” about green roofs; 45% admitted to knowing “a little”; and 45.9% had “never heard of” green roofs. Such a large gap in consumer knowledge leads researchers to seek the most effective means for creating a more informed customer base for this emerging green industry. Using Diffusion Theory (Rogers, 1983) and propositions that surround its application (Gatignon and Robertson, 1985), the researchers conceptualized methods to transfer information to lay people. The solution currently being tested is the use of a local bus shelter (retrofitted with green roof) in combination with SMART phone technology and QR codes (the technology information transfer mechanism) to increase public awareness of green roof systems for use in the built environment.

DNA Fingerprinting of Zebra Mussels (*Dreissena polymorpha*) from Higgins Lake, Michigan. Jacob Beasecker, Jeremy Schultz, and David Stanton, Saginaw Valley State University

Zebra mussels are an invasive species introduced into the Great Lakes from Europe in 1986. Since then, they have spread aggressively throughout the United States and they have had a dramatic effect on water quality and biodiversity. Genetic studies of invasive species are critical in determining the viability and potential ecological impact of these populations. Samples were collected from Higgins Lake over the past seven years and from several populations in Lake Michigan and Lake Huron. We tracked changes in genetic composition over time and determined possible source populations for migrants. DNA was extracted from frozen samples and PCR was performed in order to amplify polymorphic fingerprint loci. The PCR products were analyzed using the CEQ 8000 automated DNA analysis system from Beckman-Coulter. Fragment sizes were determined and genotypes were identified using internal reference standards. The parameters investigated included number of alleles, observed (H_o) and expected (H_e) heterozygosity, population substructure (FST) and genetic distances (D) between populations. The results show that Higgins Lake has most likely received migrants from many different locations, including distant sources and that gene flow

continues to occur. Human transport is undoubtedly responsible for the pattern observed.

DNA Fingerprinting of Walleye (*Stizostedion vitreum*) from Saginaw Bay and Spawning Populations. Stephanie Zawacki and David Stanton, Saginaw Valley State University

There is a large population of walleye in Saginaw Bay that is both economically and ecologically important. The population is heavily managed and has undergone significant variation in size in recent years. In order to properly manage this population, genetic information is required. We obtained fin clips from walleye captured in Saginaw Bay in the summer using trolling and in the winter by ice fishing. With the help of the Department of Natural Resources (DNR), we also obtained fin clips from a spawning population of walleye on the Tittabawassee River and another population on the Shiawassee River. In total, over 300 fin clips were obtained. DNA was extracted, using a DNeasy kit. PCR amplification and capillary electrophoresis was performed in order to determine genotypes for six fingerprint loci. These data provide genetic markers that allow for the assessment of genetic diversity and population substructure, as well as the determination of important spawning sites and assessment of spawning site fidelity. This information will aid management decisions regarding stocking programs, as well as decisions regarding damming of rivers and the construction of ladders to be used by spawning walleye.

Assessment of an Adult Locomotor Measuring Apparatus for Fruit Flies (*Drosophila melanogaster*): A Comparison Using Two Environmentally Different Populations. Allison Collier, Justine LaPlant, and Gary M. Lange, Saginaw Valley State University

Locomotor behavior is studied in many species, and is a dependent measure that does not involve extensive learning or conditioning. Locomotor behavior is used to understand a wide array of biologically important factors including how environmental differences between populations are reflected in physiology, development, and neural aspects of behavior. Bisphenol-A is an environmental contaminant used in plastic manufacturing, and is found in many materials used in daily life. Plastics containing bisphenol-A are varied and include many types used for food handling. Previous work in our laboratory has established bisphenol-A alters an array of developmental measures in the fruit fly (*Drosophila melanogaster*). Implicated as an endocrine disrupting compound in several organisms, effects of bisphenol-A have varied in regions and tissues of the body. Studies have shown this compound exerts xenoestrogenic effects and metabolic effects. In this study, we expand upon our previous work, exposing fruit fly eggs to an environment imbued with bisphenol-A. We present findings on how lifetime exposure to this contaminant can be assessed in adulthood using a novel, adult locomotor measuring apparatus designed in our laboratory. We compare findings

using adult locomotor apparatus with data on traditional fruit fly tests to assess the usefulness of this novel apparatus.

Effects of Caffeine on Multi-Generational Development, Metamorphosis, and Behavior of the Fruit Fly (*Drosophila melanogaster*). Thomas Beechum, Jennifer Buchner, Audrey Jeglic, Diane Marion, Jamie Roggenbuck, Thomas Trinklein, and Gary M. Lange, Saginaw Valley State University

Caffeine, the primary component of interest in coffee, is a stimulant physically and psychologically. Several mechanisms explain the effects caffeine exerts in organisms. In mammals, caffeine reversibly blocks activity on adenosine stimulated cell receptors, preventing the onset of neurological drowsiness induced by adenosine. Caffeine stimulates the autonomic nervous system, elevating heart rate and increasing blood flow in the body. In pollinating insects of caffeine producing plants, caffeine enhances reward memories, stimulating pollinators to visit more flowers.

Caffeine, however, has also been associated with altered gene expression. In rodents, chronic caffeine exposure is associated with decreased messenger RNA expression in the caudate–putamen and nucleus accumbens of the brain. Both brain regions are associated with cognitive processing related to motivation, pleasure, and reward.

Currently, little assessment of the potential of this compound to affect growth, development and behavior in invertebrates has been undertaken. In this study, we examine environmental caffeine exposure in the fruit fly (*Drosophila melanogaster*) to assess effects across the life span. Our work reports on key developmental effects, action on developmental stages, morphological effects, fecundity, and on neurology and behavior in the fly. Additionally, we examine the impact of chronic caffeine exposure across multiple generations of the fly.

Natural and Anthropogenic Impacts on *Cirsium pitcheri* at Rosy Mound Natural Area. Audrey Hughey, Jesse Dillon, Chace Scholten, Chloe Selles, Philip Simonton, and Arie Venema, Calvin College

Endemic to the Great Lakes dunes, *Cirsium pitcheri* is threatened at the state and federal level because of both natural and anthropogenic variables. This study examines these variables affecting *C. pitcheri* at Rosy Mound Natural Area on Lake Michigan's eastern shore. In fall 2014, we analyzed *C. pitcheri* in three open dune study areas, collecting species and bare sand composition, and slope in each. Site A, with 2–7% slope, was closest to the shore and adjacent to a boardwalk. Site B, with 10–20% slope, was on a windward slope adjacent to an unmanaged trail. Site C, with 25–30% slope, was on a leeward slope with a trail-free buffer. For each plant, leaf length and GPS location was recorded. For a random selection of individuals, a point-quarter vegetation survey was used to identify the nearest species neighbor. Results show similar species and bare sand

composition in all areas. Site A had the fewest *C. pitcheri* and smallest average leaf length. At sites B and C, plant locations showed clumping patterns influenced by the site topographies. These results suggest spatial distribution of *C. pitcheri* is directly affected by topography and indirectly affected by anthropogenic effects.

Spatial Analysis of Mayaro Virus Antibody Prevalence Outside of Iquitos, Peru. Viktoria Kolpacoff, Cheryl Trine, and Kanya Long, Andrews University

Mayaro virus (MAYV) is an endemic disease, similar to dengue, found in tropical areas of South America. Risk of infection with MAYV is dependent on exposure to the mosquito vector, and past studies have implicated mosquitoes in the forest canopy as likely vectors of this virus. In 2008, blood samples were collected from voluntary participants from two rural villages outside of Iquitos, Peru, and all houses in the study sites were hand-mapped. Participant sera were tested for IgG antibody to MAYV, an indicator of prior infection with the virus, and positive samples were confirmed by the more specific plaque reduction neutralization test. To determine spatial risk of MAYV infection, we plotted GPS points for the houses using historical map imagery from Google Earth, and confirmed in-person the 2008 presence of houses that could not be located in imagery. Using ArcGIS (version 10.2), we will conduct a weighted k-cluster analysis and hotspot analysis using the Getis-Ord G_i^* statistic, with the values positive and negative indicating the presence or absence of MAYV antibody in individuals matched to study houses. We expect that village residents who are antibody positive will be clustered in houses at the edges of villages, near more established forest.

Population Genetics of the Sturgeon Chub (*Macrhybopsis gelida*, Cyprinidae) in the Missouri River Basin. Meagan McNinch-Stapish, Saginaw Valley State University; Jerrod Hall, Nebraska Game and Parks Commission. Lincoln, NE; Cal Borden, Saginaw Valley State University; Gerald Mestl, Nebraska Game and Parks Commission. Lincoln, NE

Dams within the Missouri River basin have dampened the natural oscillations of water temperature, turbidity, and flows in addition to restricting access to fish spawning and nursery grounds. As a result, many native fishes have experienced declines in population sizes. Population genetics theory predicts that smaller effective population sizes, loss of habitat, and constrained spawning migrations may isolate populations and thereby potentially expose them to greater risks of extirpation. To point, populations of sturgeon chubs (*Macrhybopsis gelida*) have declined, prompting the Nebraska Game and Parks Commission to list them as “Tier 1”, a category highlighting their imperiled and threatened status. Our primary objective is to assess the genetic health of sturgeon chub populations by quantifying genetic diversity, identifying population structure, and estimating effective population sizes. To date,

approximately 350 tissues of sturgeon chubs have been collected from the Missouri River at sites above and below dams in Montana, North Dakota, South Dakota, Nebraska, and Missouri. We constructed and are now testing 10 microsatellite loci. The inferences of this work are directly applicable to conservation strategies of all fishes in the Missouri River basin. We present initial findings of this research and plans for future work.

French & Italian Language & Literature

The River, the Levee, Love, and Confession: The Thematics of Grazia Deledda's *L'argine*. Henry Cohen, Kalamazoo College

Themes that play a prominent role in Deledda's cycle of Sardinian novels are recognizable herein but in an attenuated, less socially destructive form. The paired themes of a wild river and the embankment meant to control it are developed on literal, metaphorical, and symbolic levels. The plot is built around a chain of unrequited loves and an intriguing conflation of characters who, despite their differences, under the irresistible force of erotic desire, act out that desire in ways that blur the distinctions among them. The linked themes of guilt, penitence, and confession found in many of Deledda's novels are bodied forth in a series of confessional narratives and relationships. The variety and choice of narrative points of view relate to the different forms of confession and the major themes of the novel.

Feminism and Humanism in the Films of Safi Faye. Mary Elizabeth Winther, Hope College

Currently one of the only female filmmakers in Africa, Safi Faye has been the subject of numerous academic studies. Scholars, in seeing that she was one of the first women to break into the film industry in Africa, show a strong tendency to single out her gender as the most significant element of her identity as a filmmaker. A large majority of these scholars have come to the conclusion, given that Faye is a woman in a field largely dominated by men, that her films must be laced with feminist undertones. Is this common interpretation the only possible conclusion? Or is there perhaps a more complex option, that takes into account the experiences and statements of Faye herself? In order to answer these questions, I propose an analysis in three parts. I would like to examine Faye's upbringing and first experiences with film, her unique style and cinematic choices in her filmmaking, and finally the statements that Faye has made in relation to feminism and gender roles in her films. I intend to blend the suppositions of others with the words of Faye herself to reach a more nuanced conclusion.

Geography

Comparing the Influence of Multiple Factors on Ideal and Actual Family Size between 1974 and 2004. Nathaniel McComb, Grand Valley State University

The purpose of this study was to analyze the level of influence of multiple factors on family size, and to investigate and identify any changes in the prevailing cultural system of values regarding families and children in the United States. Secondary data were collected for the years 1974 and 2004 from the General Social Survey. Twelve variables were used for analysis (2 Dependent: Ideal Number of Children and Actual Number of Children, and 10 Independent: Years of Education, Total Family Income [1974 and 2004], Country of Family Origin, Religious Preference, Strength of Affiliation, Political Ideology, Region, Size of Place in thousands, and Type of Place resided at age 16), and grouped into cultural, socio-economic, and geographic categories. The data were analyzed using a Poisson Log-Linear Regression analysis. Frequency analysis of the two dependent variables suggests a decrease in ideal family size as well as a decrease in larger (3 to 8+ children) families. Regression analysis suggests a decrease in the influence of geographic factors between 1974 and 2004, as well as a consistent influence of socio-economic factors on actual family size. Cultural factors (specifically related to religion) were influential on both dependent variables for the two different years.

Comparative Analysis of Vehicle Collision Rates of Intersections Reconstructed to Roundabouts in Michigan. Melissa Salich, Grand Valley State University

The purpose of this research was to compare vehicle crash rates in intersections reconstructed to roundabouts with the standard of annual average daily traffic (AADT) in the state of Michigan. Existing data were used for analysis of the research question. Detailed crash reports were obtained from the Michigan State Police (MSP). Traffic count data were provided from the Michigan Department of Transportation (MDOT) and Michigan State Planning and Development Regions (SPDRs). A comparative analysis was conducted to determine the difference between the two means, before the roundabout existed and after. Results indicate that there is no significant difference in the pre and post-roundabout accident rate for traditional intersections that have been reconstructed to roundabouts.

Quantifying Urban Blight in Grand Rapids, Michigan: An Application of the Weaver-Bagchi-Sen Methodology. Nicole Arce, Grand Valley State University

This study utilizes Anselin's Local Moran's I to detect clusters of urban residential blight at the census tract level in Grand Rapids, Michigan, from

January 2006 through December 2012. Given blight's potentially subjective nature, an instance of blight was defined in this study as a violation of a real property code, as these codes define the conditions and uses of real property that are unacceptable to the community. The purpose of this study was to determine whether the number of violations per unit of housing in a given tract was randomly distributed throughout the study area. Although the specific tracts signaled as clusters changed over the course of the study period, it was found that the null hypothesis of spatial randomness could be rejected. Results like those obtained in this study could help decision-makers utilize empirical data to better understand the geography of blight in their communities and thus allocate anti-blight funding with increased confidence of a positive outcome.

Predicting Caudate Habitable Range around Sorter Lake, MI. Philip Reed and Becky Laughton, Grand Valley State University

Caudate habitation around Sorter Lake, Oceana County, Michigan, has never been researched for its herpetofaunal potential over geographic space. The area surrounding Sorter Lake represents an area of minimal recreational disturbance and consistent management by the USFS for wildlife and their habitat. By analyzing the land cover, hydrography, elevation and vegetative density we are able to predict the areas of likely habitation as well as estimate the population of Caudates. The normalized difference vegetation index and unsupervised classification tools were used from Erdas Imagine to produce the vegetative density and land cover maps, while the contour and buffer tools in ArcMap 10 were used to create the topography and hydrography maps. A final map was produced using the intersect tool and shapefiles from all four maps to identify overlapping zones. In total approximately 120 acres of the study area was found to be suitable habitat for Caudates with an estimated 800 individuals inside that range.

Geological Sciences

Types and Locations of Pleistocene Deltas in the Lower Peninsula of Michigan. Michael D. Luehmann and Randall J. Schaetzl, Michigan State University

This study examines the various kinds of relict Pleistocene deltas in Lower Michigan, in order to better infer paleocoastal and terrestrial conditions during their formative periods. Topographic data, used in conjunction with surface and subsurface textural data, enabled us to find 58 relict Pleistocene deltas in the Lower Peninsula. For each delta and its modern catchment, 29 topographic and soil textural attributes were collected. Predominant morphologic variables from this data array were evaluated using principle component analysis (PCA). The PCA identified four components that explained $\approx 72\%$ of the total variance.

These components were interpreted to represent the sediment size, topography, region, and size of the deltas. Ward's hierarchical clustering of the PCA scores suggested four clusters of delta types, and K-means clustering was employed to assign the 58 deltas to four main groups. Group 1 deltas have multiple paleodistributary channels across a large delta plain; they also have high percentages of clay, silt, and gravel. Group 2 deltas are sandy and have small delta plains. Group 3 deltas are also sandy but have a relatively steep delta-plain slope and high relief catchment areas. Group 4 deltas are composed of wet soils and have catchments with high clay and silt contents.

Nutrient Movement through a Storm Water Management Complex at Grand Valley State University. Ashley Brady, Tara Kneeshaw, and Peter Wampler, Grand Valley State University

Over the summer of 2012, a high resolution monitoring program was implemented to evaluate the overall efficiency of the newly constructed detention pond system to remove suspended solids and contaminants following precipitation events. Runoff from parking lots originated from irrigation or precipitation enter the system at the first detention pond in the system and travel through the ponds to treat the water and eventually let out into a final fourth detention pond. The efficiency of this system can be measured by comparing nutrient concentrations in pond 1 and pond 4 during rain and baseline events. The nitrate concentrations decreased from the first to the fourth pond throughout the system (pond 1 average was 0.89 ppm compared to pond 4 average 0.40 ppm). The orthophosphate concentrations decreased from the first to the fourth pond throughout the system (pond 1 average was 0.17 ppm compared to pond 4 average 0.04 ppm). Overall, the efficiency of the storm water management complex can be observed through the nutrient levels throughout the wetland system, and it appears that the constructed wetland system is working to remove excess nutrients.

Efficacy of Planted Vegetation and a Sand Fence at Castle Park Dune Preserve. Kathryn E. Gerber, Melanie A. Compagner, Rachel L. DeHaan, Jessica A. Petrie, and Jen-Lyn Sin, Calvin College

Lake Michigan coastal dunes are dynamic environments often requiring management strategies to mitigate human impacts. This study investigates the efficacy of a sand fence and planted vegetation as management techniques at Castle Park Dune Preserve in Michigan. The vegetation and sand fence were established on the windward slope of the dune between 2012 and 2014. During the fall of 2014, we documented dune features by measuring slope angles and using GPS to map boundaries between bare sand and vegetation. We set up and monitored erosion pins upwind and downwind of three areas of planted vegetation to gauge sand deposition. We also measured vegetation characteristics in five randomly-selected quadrats within each of the three planted areas. Results

show that although *Ammophila breviligulata* was the species introduced initially, one or two additional species were present in all of the planted areas. The greatest rate of aeolian movement occurs upwind of the fence and in un-vegetated regions downwind of the fence. Vegetated areas experienced less transport, with areas of greater average density, number of stems, and leaf length experiencing the least movement. This suggests that increasing vegetation density, coupled with the current sand fence, would be most effective for stabilizing the surface.

Loamy, Two-Storeyed Soils in Southwestern Lower Michigan: A Mixture of Loess with the Underlying Outwash Sand. Toni A. Walkowiak, Michael D. Luehman, and Randall J. Schaetzl, Michigan State University

This research examined the spatial and textural characteristics of soils in southwestern Lower Michigan that have formed in loamy materials over glacial outwash. Typical soil series of this type are Kalamazoo and Schoolcraft. We hypothesized that they have formed in loess, which subsequently had become mixed with the sandy sediment below. We sampled 164 sites on flat uplands, all of which are comprised of 25–190 cm of loamy materials over outwash. Particle size curves for the upper, loamy material exhibited distinct bimodality, with a primary peak (mode) in the silt fraction and a second peak in the sand fraction. Outwash sediments displayed only one (sand) peak. These data led us to conclude that the upper material was silty loess mixed with outwash sand from below, due to pedoturbation. Spatial patterns of thickness and textures suggested that the Niles-Thornapple spillway, along with its main tributaries, the Kalamazoo and Thornapple Rivers, were the main sources of this loess. These broad valleys carried meltwater derived from silt-rich, but otherwise loamy, drift of the Saginaw lobe. Prevailing westerly winds deflated silts and fine sands from these spillways and deposited these sediments as loess on landscapes to the east.

A Scheme for Evaluating the Impact of Development on the Geomorphic and Ecologic Processes of Lake Michigan's Coastal Dunes. Jacquelyn K. Plowman and Suzanne J. DeVries-Zimmerman, Hope College; Charles F. Davis III, Davis Associates Architects & Consultants, Inc.; Edward C. Hansen, Hope College

Recent changes to Michigan's Critical Dune Law initiated this study to create a science-based, public policy tool for evaluating a development's impact on the geomorphology and ecology of Lake Michigan's coastal dunes. The revised law requires that regulators consider the diversity, quality, and function of the dunes when reviewing Critical Dune building permits. Hence, our current scientific understanding of geomorphic/ecologic processes in the dunes was used to create a two-part decision-making flowchart. The first part evaluates a development's impact on the dune's physical processes in three categories: dune mobility, erosion by gravity, and pavement effects. The second part evaluates the impact on the type and number of ecological communities and the species composition

within those communities. Five development scenarios with different dune/ecology settings, house/road layouts and densities were evaluated. The amount of dune mobility, and consequently, the amount of sand burial, decreased in our scenarios. Ecologically, early pioneer and sensitive species dependent on sand burial were lost due to the resulting dune stability. This scheme is useful for assessing the impact of one development scenario versus another in different coastal dune settings and also shows promise in providing a science-based tool for managing the coastal dunes.

Boardwalk Interaction with a Lake Michigan Dune System. Gabe LePage, Bastian Bouman, Benjamin Johnson, Ryan Kiper, and Madison Smith, Calvin College

Boardwalks enable visitors to enjoy the dunes in a way that protects the sensitive dune environment, but a tension remains as boardwalks themselves alter the dune system. This study investigates how a boardwalk in Hoffmaster State Park, Michigan interacts with a dune's processes as the boardwalk brings visitors to a lookout over Lake Michigan. Methods included mapping the boardwalk and evaluating the quality of its features. Human impacts were investigated by documenting unmanaged trails and visitor activity. Erosion pins were used to detect dune surface change. Ecological communities were mapped, and vegetation conditions by the trails were recorded. The boardwalk ends at two viewing platforms and is worn but functional. A network of unmanaged trails indicates that people leave the boardwalk, and erosion pin measurements revealed surface change along these trails. The boardwalk and the unmanaged trails interrupt the ecological communities. While boardwalks enable enjoyment of the dune and protect the environment, they also provide destination and departure points which encourage the formation of unmanaged trails and influence dune processes. Understanding the spatial patterns of human interaction with the dune will be important as park staff plan to reconstruct the boardwalk next fall.

The Impact of Deer on Unmanaged Trails in North Ottawa Dunes County Park. Brian D. Hilbrands, Jesse L. Damsteegt, Brian P. Hess, Madeline G. Hughey, Jake A. McCusker, and Jacob C. Van Wyk, Calvin College

The impacts of mammals such as deer on coastal dune geomorphology have received little attention from the scientific community. This study looked at the relationship between deer and unmanaged trails in a dune environment and what effect deer might have on human use of unmanaged trails. The study site was a large parabolic dune in North Ottawa Dunes County Park. A main objective of the study was to investigate whether there was any differentiation in characteristics between deer trails and trails used by both humans and deer. At the study area, unmanaged trails were mapped using GPS units. Measurements for each trail included width, vegetation cover, and leaf litter. Deer activity such as

individual tracks, deer droppings, and bedding areas were also mapped to identify where deer have been active. Results show a number of unmanaged trails going across the bottom of the dune and fewer trails on the higher, steeper slopes. Although the trails lacked vegetation, there were no observed local topographic changes. Also, most trails were exclusively used by deer. These results suggest that the creation of unmanaged trails by deer is not encouraging park visitors to leave the managed pathways and use the unmanaged trails.

USGS Monograph 53—A Centenary Appreciation of a Classic. Diane Baclawski, (Retired) Michigan State University

In 1915, the USGS published Monograph 53, the last of the three treatises covering the glacial history of the Midwestern states. Co-authored by Frank Leverett and Frank Bursley Taylor, *The Pleistocene of Indiana and Michigan and the History of the Great Lakes* summarized 30 years (1885–1915) of research on the glacial features and lake basins carved out during the Wisconsinan. In cooperation with other geologists in USGS and the State Surveys, Leverett and Taylor used the description and correlation of the morainic systems and drainage basins to develop a chronological sequence for the deglaciation of the area.

Modern geologic field techniques and the passage of time tend to diminish the significance of the great work done by the field geologists of the last century. GPS and low angle oblique satellite photographs of the Great Lakes show clearly the wonderful system of moraines outlining each of the Great Lakes. In 1915, each moraine and shoreline had to be painstakingly mapped by charting differences in barometric altimeter readings and correlating those with railroad survey markers.

Leverett never considered Monograph 53 as final or complete. It is a classic because of its value as a springboard for continued research by future generations of glacialists.

Characteristics of a Natural Vegetation Population on Lake Michigan Foredunes. Natasha Strydhorst, Samuel Franklin, Lemuel Ong, and Aaron Pemberton, Calvin College

Although Lake Michigan's coastal foredunes are predominantly vegetated with *Ammophila breviligulata* (American beachgrass), the natural characteristics of this species have not been documented. This study identified and analyzed the characteristics and environmental conditions of *A. breviligulata* populations in P.J. Hoffmaster State Park. We analyzed three areas of vegetation growth on the foredunes: one in which human influence was present (in the form of unmanaged trails), one in which wave erosion had created a steep scarp, and a control area with a slumped scarp and no significant human influence. In each area, we measured the height and density of *A. breviligulata*, recorded the presence of unmanaged trails and measured scarp characteristics. Density of *A. breviligulata*

was consistently greatest on the foredune's leeward slope. The greatest density was observed in the site of human disturbance, while the greatest height was recorded in the control site. Scarping affects the vegetation near the scarp, but does not influence the vegetation beyond the foredune crest. Understanding *A. breviligulata*'s natural characteristics could provide a model for assessing the success of planting vegetation at managed sites.

Long-Term Effects of Planted *Ammophila breviligulata* on North Beach Dune. Jacob T. Swineford, Issac J. Jacques, Manny L. Schrottenboer, Matt Wierenga, and Grant Hoekwater, Calvin College

Ammophila breviligulata is a beach grass commonly planted for dune management because of its burial tolerance and effectiveness in sand stabilization. The long term effect of planted beachgrass is not fully understood. This study investigated the vegetation health, distribution, and density of planted *A. breviligulata* in relation to site characteristics. The study location is North Beach dune, which has been moving towards the only access road for many shoreline homes. To stabilize the dune, Ottawa County Park staff and volunteers have been planting *A. breviligulata* periodically over the past ten years. Our investigation included comparing photographs from 2004 to 2014 and using GPS to map vegetated areas. We divided the study area into 9 sections to measure plant health, maximum height, and density within randomly selected quadrats. The photographs showed that the planted beach grass has spread across much of the windward slope of the dune. Grass near sand fences was taller and healthier than grasses in transition areas between bare sand and full vegetation. Areas with steeper slopes had generally taller, healthier plants than areas with gentle slopes. Our results suggest that 5–10 years after planting, *A. breviligulata* was moderately healthy and offering greater protection to the dune surface.

Health & Human Services

A Whole-System Based, Integrated, and Interdisciplinary Framework to Improving Patient Experience, Revenue Cycle Management, and Financial Performance of U.S. Hospitals. Lihua Dishman, Lawrence Technological University

Patient experience (PX) has emerged as an area of research and impacts hospital financial performance (FP; The Beryl Institute, 2014). Revenue cycle management (RCM) has gained prominence as one of hospital FP predictors (Rauscher, 2010). Yet, understanding is limited regarding interplays among PX, RCM, and FP. The three constructs thus guide a systematic selection and review of some 250 theoretical or empirical articles. Three broad themes have emerged. Notably, PX relates to hospital governance, leadership, stakeholder engagement, evidence-based practice, patient-centered care, care coordination and continuity,

optimized operations, and information disclosure and transparency. The comprehensive literature review has also revealed five important gaps. Most significantly, there is scarce empirical evidence that hospital mission, vision, and core values (MVCV) embody stakeholder engagement and hospital boards play strategic leadership roles in continuous quality improvements. Accordingly, a whole-system based, integrated, and interdisciplinary (WII) framework is proposed to bridge the gaps. WII expands Donabedian's structure-process-outcome framework by clearly stating patient-family-community engagement in organizational MVCV; defining the roles of governing boards composed of key internal and external stakeholders; aligning organizational MVCV with organizational strategies reflecting continuously improving PX, RCM, and FP; positioning healthcare information technologies; and including FP results. Furthermore, WII may guide future empirical studies.

The Relationship between Health-Maintenance Preferences and Health.

Kiara Dillard, Andrews University

This study examined the relationship between certain self-medication practices (OTC drug usage and home remedy usage) and health. The primary hypothesis was that better health would be more associated with one of these forms of self-medication practices. Participants completed an adapted version of the Questionnaire to document Self-Medicating Behaviours and the SF-36 Health Survey. Preliminary data analysis supported the hypothesis. Spearman rank-order correlation analysis of the data received from 109 out of the expected 300 subjects thus far revealed a significant inverse relationship between self-medication practices and health. Specifically, OTC drug usage was more negatively associated with health than home remedy usage. These results would suggest that people who use more OTC drugs in relation to home remedy usage have poorer health outcomes. An important implication of this study is that it may suggest a way people can improve their health.

Mentoring as It Relates to Persistence in Associate Degree Nursing Students. Caroline M. Peltz, Eastern Michigan University

The purpose of this descriptive study was to increase the understanding of mentoring as it relates to the perceived ability to persist among nontraditional students (N = 283) enrolled in associate degree nursing programs at community colleges. This investigation presented a discussion of how student involvement in a mentoring relationship and the domains of mentoring differed by associate degree nursing student characteristics. Additionally, the domains of mentoring and student involvement in a mentoring relationship were explored with the associate degree nursing students' perceived ability to persist. Differences were found when describing the student characteristics of gender, enrollment status and nursing course failure for student involvement with a mentor. A significant relationship was found between psychological/emotional support and the

existence of a role model. Researchers have the opportunity to build a consistent definition of mentoring and a conceptual framework for traditional and nontraditional nursing students enrolled in two- and four-year institutions through the continued exploration of mentoring and how mentoring relates to the perceived ability to persist. This investigation has contributed to the evidence base to support mentoring of nursing students. The more evidence-based strategies are used to enhance nursing education, the better the outcomes will be to improve the preparation nurses receive.

Practice-Based Scholarship in Healthcare Professions: The Challenges of the Decade of Behavior and Big Data. Patricia A. Rouen and Janet M. Baiardi, University of Detroit Mercy

The transition to a healthcare system grounded in prevention and population health has placed increased attention on individual's health behavior and surrounding environments. Additionally, growing emphasis on shared decision making between healthcare providers and patients and outcomes-focused care has impacted healthcare practice.

With the advent of the practice doctorate in nursing in addition to the research doctorate, the vision for practice-based scholarship has been challenged and continues to be clarified and operationalized. Dimensions of practice inquiry are broad, emphasizing the investigation of questions from nursing practice, including the appraisal and translation of evidence for practice to the evaluation of evidenced-based care on health care outcomes and systems. These broad perspectives for practice scholarship challenge curricula with the need to prepare graduates familiar with diverse methodological and analytic approaches to translate, evaluate or generate new practice knowledge.

We discuss these challenges of practice-based scholarship in the context of the vision for evidence-based practice in healthcare and address the multiple forms of practice evidence, the transition to community-based health care and the era of big data for population health. We propose strategies to develop a base of practice-relevant literature that demonstrates the impact of the doctorally-prepared nurse in healthcare settings.

Maturation of Tactile Acuity in Typically Developing Children. Mountaha A. Eidy, University of Michigan-Ann Arbor; Paige M. Marken and Paige Albert, Spring Arbor University; William S. Schermer, University of Michigan-Ann Arbor; Michael A. Buratovich, Spring Arbor University; Susan Brown, University of Michigan-Ann Arbor

Typically, tactile acuity reaches a maturational endpoint by 10–12 years of age. However, the developmental time course associated with tactile acuity may vary depending if tactile registration tasks or tactile perception tasks are assessed. Typically developing, right-handed participants were assigned to two groups:

children (8–13 yr) or adolescents (15–20 yr). Sensory function was assessed using the Semmes-Weinstein monofilament test. A newly developed tactile device was used to quantify pattern discrimination ability as a measure of tactile perception. Motor-enhanced tactile perception was assessed using a stereognosis task. Hand functional measures included the Jebsen-Taylor hand function test and the 9-hole pegboard test on both hands. Monofilament testing revealed no differences between the two age groups, but processing time associated with the pattern discrimination task decreased significantly with age for the dominant hand ($p < 0.01$). Similar improvements in the time required to identify objects in the absence of vision (stereognosis) were also seen for both the dominant and non-dominant hands ($p < 0.01$). As expected, hand functional measures revealed age-related differences. Thus tactile registration matures earlier than tactile perception in typically developing children. Further, this work underscores the importance of assessing different aspects of tactile sensibility, particularly in pediatric conditions characterized by hand dysfunction.

A Health Profile of African Americans in Michigan: A Novel Approach to Using a Hospital Administrative Database. Florence J. Dallo, Oakland University; Julie J. Ruterbusch, Wayne State University; Joseph D. Kirma, Oakland University; Kendra Schwartz, Wayne State University; Monty Fakhouri, Beaumont Health System, Oakland University, William Beaumont Medical School

The objective of this study was to estimate the prevalence of heart disease, cancer, chronic lower respiratory disease, stroke, Alzheimer's, diabetes, nephrosis, flu/pneumonia, hypertension, and atherosclerosis between African Americans and whites attending a large, metropolitan hospital system. The sample included 86,038 patients, 18 years of age or older, who visited the institution during 2012. Demographic and disease variables were electronically abstracted. Sex specific, age-adjusted prevalence ratios (PR) and 95% confidence intervals were estimated using a log-binomial regression model. African Americans were more likely to suffer from chronic conditions compared to whites. For example, compared to white men, black men were statistically significantly more likely to have stroke. The prevalence ratio for black men with stroke was 1.25 (95% CI = 1.12–1.40) compared to white men. Compared to white women, black women were more likely to have nephrosis (PR = 1.48 [95% CI = 1.39–1.57]). The method of using a hospital database is beneficial as the data collected are reliable. This study supports previous findings that racial and ethnic health disparities exist. This methodology can be used to analyze the health conditions of other minorities in future studies, where little data exist.

The Myths of Death: Perspectives from Medical Directors. Nick Bayer, Grand Valley State University

In the field of hospice care various physicians, caregivers, and social workers are consistently combating with what is commonly referred to as the myths of hospice, or the myths of dying. The goal of this presentation is to focus on the myths regarding physical decline and changes as an individual approaches the end of life. This presentation will offer insight from semi-structured interviews of various medical directors employed in hospice organizations of Grand Rapids, Michigan in regards to common myths and misunderstandings they encounter with clients and families at the end of life. A minimum of 5 interviews ($n = 5$) will be conducted for the purposes of this project. Hospice medical directors are excellent sources of information on the myths of dying due to their extensive medical knowledge as well as the close contact with individuals and families experiencing the end of life. Interviews will then be coded and compared with a review of literature on the topic and will then seek to identify possible factors that influence the prevalence of these myths and misunderstandings using both sources of information as evidence.

Nutrition Education in Nurse Practitioner Curricula in Michigan. Caroline B. Trapp, Madonna University

Nutrition-related diseases such as heart disease, stroke, and diabetes are among the leading causes of death and disability in Michigan. Evidence-based nutrition interventions have been shown to be effective in reducing rates and progression of these diseases. Healthy People 2020 has called for nutrition counseling in 75 percent of primary care clinician office visits for individuals with hypertension, hyperlipidemia and/or diabetes. Clinician training may be a barrier to meeting this goal. It has been well-established through ongoing surveys that the nation's medical schools do an insufficient job of preparing physicians to address clinical nutrition concerns. The quantity and quality of nutrition education within nurse practitioner programs is unknown. The last survey on nutrition education in schools of nursing at the undergraduate and graduate levels was published in 1987. Despite an epidemic of nutrition-related diseases, there are no national standards or competencies for nutrition education among nurse practitioner programs. As a first step towards building nutrition capacity, a survey to characterize nutrition education within primary care nurse practitioner programs in Michigan ($n=6$) was conducted. Results and recommendations will be presented.

Multisystem Influence on Alcohol Use among Christian College Students: A Grounded Theory Approach. Alina Baltazar, Duane McBride, and Karena Griffiths, Andrews University; Barbara Ames, Michigan State University

College students participate in numerous health-risk behaviors that may put them at risk for developing addictions and/or chronic diseases, or even put them at risk for early death. This study focused on alcohol use. Results from a health risk behavior survey given on an alcohol-abstinent Christian campus were analyzed ($N=760$). Logistic regression analysis was used to develop two models

that explain the frequency of regular alcohol use and binge drinking. Results show open communication with parents on the topic of drugs, sex, and alcohol decreased regular alcohol use and binge drinking by about 30% in the one set of models, and believing “God wants me to take care of my body” decreased regular alcohol use and binge drinking by about 60% in another set of models. No ethnicity or gender differences were found in either set of models. Follow-up focus groups (N=53) supported these results, but found that more individual reasons for consuming alcohol and binge drinking were related to recreation, coping, accidental overconsumption, and addiction. A grounded theory built upon Bronfenbrenner’s human ecology theory showed the individual was influenced by micro-system relationships (parents, peers, school, spirituality), meso-system interactions (peers-school and parents-religion), and macro-system cultural standards (secular culture and religiosity).

Frailty Syndrome: Implications for Practice. Susan Bushinski, Eastern Michigan University; Sheria Grice Robinson, Wayne State University

Background: Frailty is chronic, progressive, syndrome of dysregulation of multiple body systems and low-grade inflammatory state. By 2025, 1.2 billion people in the world will have Frailty Syndrome, creating a medical epidemic.

Purpose: To provide benchmarks for diagnosis, and to summarize evidence-based guidelines for treatment.

Methods: Forty articles were selected from a review of literature using key words (frailty, frailty syndrome, failure to thrive). CINAHL and PUBMED data bases were explored.

Results: The literature revealed five diagnostic criteria for the syndrome: Sarcopenia, Fatigue, Diminished Walking Speed, Low Functional Status, and Weakness. The literature failed to identify evidenced-based guidelines for either treatment or slowing the progression of the syndrome.

Conclusions: Future research efforts should be aimed at prevention in the general population of older adults, early identification of individuals suffering from this syndrome, and inhibition of the progression of the syndrome

Implications: The burden of this syndrome upon medical cost and resources within the United States will be great and further research is needed to determine how not only to prevent it from occurring, but stall its trajectory and decrease its mortality rates.

HIPPA and HITECH: Looking Back and Looking Ahead. Leena Singhmar and Minnie Bluhm, Eastern Michigan University

When private medical information is improperly revealed, people can be injured. Not only can the revelation of such information be embarrassing, but

its misuse may also result in inappropriate practices related to such things as hiring and insurability. Disruptions in employment status and personal or family relationships can also occur. In partial response to this growing concern, the Health Insurance Portability and Accountability Act (HIPAA) was signed into law in 1996. HIPAA's provisions included, among other things, protecting the privacy of health care data and facilitating the transfer of electronic healthcare transactions. More recently, the Health Information Technology for Economic and Clinical Health Act (the HITECH Act) was passed to shore up gaps in HIPAA, promote efficiency, and bolster patient privacy. Clinical and administrative healthcare professionals now have new and pressing legal obligations, as well as ongoing moral obligations, to safeguard protected health information (PHI). The purpose of this paper is to review the need for HIPAA and HITECH, examine their successes and failures, and consider future challenges for the U.S. healthcare system in managing privacy concerns, in an era increasingly dominated by electronic transactions.

Children's Restaurant Nutrition Environment in Kent County, MI. Arlene J. Hoogewerf, Daniel Ardis, Jeddidiyah Bell, Laura Belling, Amy Bohner, Ali Carpenter, Austin Coallier, Briella Cummings, Abigail Fincel, Colleen Griffin, Jessica Howkins, Ni Ni Iang, Yahroy Kim, Eyrarn Kpodo, Audrey McIntosh, Luke Newton, Mary Nieves, Olivia Pina, Isaac Ridderhoff, Shawntavia Stewart, Amanda Tackie, Julia Van Dyke, Kara Vogelzang, and Tessa Vroegop, Calvin College

Childhood obesity has doubled since 1982. Meals eaten at restaurants has also increased, and may have negative health consequences due to the higher fat and calorie content of restaurant compared to home-cooked meals, as well as the lower fruit, vegetable, and fiber content of restaurant meals. We modified a Nutrition Environment Measures Study to examine the restaurant nutrition environment for children in Kent County, Michigan. 230 of 337 restaurants assessed (34%) had children's menus. The average number of healthy and unhealthy entrees per restaurant was 0.8 and 5.0, respectively. Less than 46% of the restaurants offered at least one healthy entrée, fresh fruit, or non-fried vegetables. Restaurant type was an important factor, as 90% of Italian and 79% of Sandwich/Deli restaurants offered healthy entrees compared to only 38% of American and 39% of Mexican/Tex-Mex restaurants. Interviews with personnel in a subset of restaurants (18) that offered both healthy and unhealthy entrees indicated that when available, healthy choices were among the top choices <20% of the time. Availability of fresh fruit, non-fried vegetables, nutritional information, 100% juice, and low-fat dairy items varied among fast-food, fast casual, and full service restaurants. The children's restaurant nutrition environment in Kent County, MI needs improvement.

Trangenerational Effect of Substance Abuse between Students, Parents, and Grandparents. Subira Brown, Andrews University; Duane McBride, Andrews University/Institute for Prevention of Addictions

Objectives: To examine students' use of alcohol and marijuana use in relationship to the substance abuse problems of parents and grandparents.

Methods: Data were obtained in a classroom survey of students in a mid-western Christian university. The total number of subjects is 750. The study was approved by the university's IRB committee. The purpose of the survey was to examine risk and protective factors in student health risk behavior. The data were collected by trained personnel and entered into an SPSS data file. The data were analyzed using SPSS 21.

Results: Data analysis showed significant relationships between the students' alcohol and marijuana use and the substance abuse problems of their parents and grandparents. The relationship between the students' alcohol and marijuana use were both significant for father; however, it was only significant for mother in terms of marijuana use. Grandparents' substance abuse problems were significantly related to the students' use of both alcohol and marijuana. Grandparents' substance abuse was also significantly related to students' sexual activity.

Implications: Data suggest that it is important for schools to examine family substance abuse history in order to assess student risk factors and if necessary to provide necessary prevention and early intervention services.

Informed Practice: Students' Clinical Experiences in the Undergraduate Phase of an Accelerated Physician Assistant Program. Amy Dereczyk and Rachel DeWitt, University of Detroit Mercy

Introduction: The purpose of this qualitative study was to explore the experiences of physician assistant students in an accelerated program as CNAs or EMT-Bs, to describe their perceptions of the older patient population, communication, bedside manner and clinical preparedness to enter a physician assistant program.

Methods: This is a qualitative study that used a focus group to explore students' clinical experiences prior to progressing to the graduate portion of an accelerated physician assistant program.

Results: The four research questions that were answered by participants fell into two basic themes, "informing practice" and "forming relationships." In regards to the former theme, participants felt that their experience as an entry level healthcare provider allowed them to improve their communication skills, bedside manner, and greater comfort with patients. Theme two showed that

participants gained an appreciation for older people and began to recognize knowledge deficits and learning needs of their patients.

Discussion: Results suggest that clinical experience as a CNA or EMT-B has a significant effect on healthcare provider development prior to entering a PA program. It was reported by participants that not only did their experiences shape their personal development but their attitude towards being part of the healthcare team.

The Development of Critical Thinking Skills of Health Science Majors in an Urban Liberal Arts College. Silja Martinez and Li-hsuan Yang, Marygrove College

Critical thinking skills are essential for nurses so they can make sound decisions and provide high-quality patient care. However, previous findings indicated that many nursing students were not developing the necessary critical thinking skills. This study examined whether the undergraduate health science students in an urban liberal arts college were developing critical thinking skills every year from freshman to senior standing when they prepared themselves to pursue a nursing degree after completing their studies in the liberal arts college. Forty-seven students participated in this study. A modified version of the Ennis-Weir Critical Thinking Essay Test was used to assess the participants' critical thinking skills. The results revealed a significant difference in the overall scores between freshmen and seniors (p -value = 0.013). However, the scores from all four college standings were alarmingly low. Implications for future studies were discussed.

The Effects of Chronic and Acute Bach Flower Solution Administration on Anxiety-Like Behaviors in Long-Evans Rats. John Melton, Tam Gilligan, Thomas Wright, Danielle Meyer, and Hana VanderVeen, Hope College

Holistic and Western medicine have been in conflict, however, many compounds widely used today were built upon the foundation of plants and minerals still used in herbal remedies. One such remedy, Bach Flower Solution (BFS), is reported to have anxiolytic effects on the body. BFS is commonly used in veterinary medicine to relieve acute anxiety in animals and has been used with dogs to prevent anxiety during thunderstorms. BFS producers have made commercial claims that the mixture has anxiolytic effects but few scientific studies exist to support or refute this claim. The elevated plus maze (EPM) and forced swim test (FST) were selected to evaluate anxiety-like behavior in 20 Long-Evans rats treated with BFS. Chronic BFS administration produced a significant increase in open arm activity in the EPM, which can be interpreted as a reduction in anxiety-like behaviors. There were no significant rotarod activity changes for chronic administration of BFS, suggesting that the significant findings in the EPM are due to a reduction in anxiety rather than a reduction in general motor activity. Such outcomes could positively influence future research on the

use of herbal remedies in modern medicine as well as advance the treatment of anxiety disorders in humans.

History

Australia at the Geopolitical Crossroads in the 21st Century: Seeking a Path of Prosperity and Security in the Indo-Asia-Pacific Region. Randall Doyle, Mid-Michigan Community College

During the twentieth century, Australia described itself as suffering from the “tyranny of distance” with concern to the daily and mainstream activities associated with global affairs. It was continually a point of frustration often expressed by its business and political leaders. Also, there was a reluctant acknowledgement that Australia was simply not that important in world affairs.

However, in the early decades of the twenty-first century, it became quite apparent to the U.S. and its Asian allies in the Indo-Asia-Pacific region, that geography has now become Australia’s key asset in terms of its growing geopolitical importance. Put simply, the long understood challenge that the “tyranny of distance” represented to Australians has now been completely reversed. Australia now finds itself the geopolitical “hinge” between the western Pacific and the eastern Indian Ocean. The land ‘downunder’ is now quite strategically important for the United States and its Asian allies as they grapple with the challenges of a rising China—economically and militarily.

Therefore, from an historical standpoint, the twenty-first century irrefutably represents a new phase for Australia and its evolving role in the Indo-Asia-Pacific region.

Hierarchy and Fraternity—the Fragmented City on a Hill. Denise R. Ervin, Marygrove College

The Puritans that came to establish the “city on a hill” thought of themselves as aligned with a holy calling, but struggled with the contradiction of maintaining fraternity within a hierarchical structure. Through the selection of those making the journey, a clear distinction was revealed between the differences in what the Puritans esteemed (education, wealth, gender, and piety) and what they tolerated (everyone and everything else). Binaries like men/women, ministers/laity, free/slave or indentured, and normal/deviant meant one was always valued above another, but this incongruity existed in the face of doctrine that taught that all were equal in the sight of God and resulted in a constant valuation of who was important in society, who could be trusted, and who would be the first to have a finger pointed at them when something went wrong. The treatment of Antinomian champion Ann Hutchinson and the Salem Witch Trials provide examples of a world where religiosity designed to promote fraternity suborned hierarchy, isolation, and murder.

It begs the question: What would society have been like if the fraternity of Puritan theology became a part of the world in which they lived, not just the notion they turned to when hierarchy proved inconvenient?

The *Liberdade* to be Found at Sea: Joshua Slocum, *Liberdade*, and the Birth of the First Solo Circumnavigation. Donald A. Laskey, Central Michigan University

In 1888 a small boat, known as *Liberdade*, came up the Potomac to Washington DC. This boat, a combination of sampan, junk, and Cape Ann dory, seemed made to grab attention and headlines. The story of *Liberdade*'s voyage completed by a shipwrecked family made it into papers as far inland as Wichita. This voyage was made into a book, *Voyage of the Liberdade*, by its captain Joshua Slocum. Slocum went on to be the first to complete a solo circumnavigation, from 1895–1898. My contention is that the building of the *Liberdade* was the turning point in Slocum's life from sailing master to adventure writer, as opposed to the traditional historiography, which sees this as the point of transition from sailing master to unemployed laborer, only later to hit upon the idea of the circumnavigation. Once Slocum lost his last merchant vessel, *Aquidneck*, he built *Liberdade* as part of a larger plan to take advantage of the 1880s market for travel writing, which resulted in the circumnavigation.

The Intellectual Influences of Sigmund Freud's Psychoanalytical Theory on Leon Trotsky. Polina Popova, DePaul University

This work's main argument is that Trotsky was persistent in his references to Freud's ideas regarding freedom of education and attitude to religion. The work argues that there was a strong intertextuality in the works of Freud and Trotsky and a particularly strong influence of Freud's psychoanalytical theory on Trotsky's latest works. The central concern of this research is Trotsky's intellectual engagement with Freud's ideas, rather than the political imbroglio of which they became a part. It analyzes works by Trotsky, in which Freud or his ideas were mentioned directly, as well as those where Freud's ideas were presented implicitly. The work suggests that Freud's influence on Trotsky was more significant than others have supposed, particularly in terms of the commonality of their ideas on religion. The paper argues that Trotsky's admiration for Freud was part of a "bigger picture"—his search for truth and objectivity in science, along with his attempt to improve the Russian pedagogical system by imbuing into the education of the working class Freudian ideas on freethinking and freedom from religion. The paper analyzes a variety of books, articles, speeches, and letters written by Leon Trotsky from 1923 until 1940.

War Stories: Elder Memoir. Derek Stefanovsky, Alma College

The life of Mr. Robert Jarrett is significant and deserves recognition. The process of creating this memoir has taught both the elder and the student

important life lessons including trust, dedication, and honor. Mr. Jarrett is a World War II veteran, and even after 94 years of life, he still has important lessons for all of us, both young and old. The primary focus of this memoir is on his time in central Europe during the war, including The Battle of the Bulge and a heroic encounter with a German sniper. Other significant aspects of his life, including his childhood before the war and his life spent raising a family after the war are also documented. In retirement, Mr. Jarrett remains an important member of our community through his woodworking, antique restoration and community service.

Big Data and the Search for Balanced Insight in the Digital Humanities: Macroscopic and Microscopic Reading of Citation Strategies in the *Encyclopédie* of Diderot (and Jaucourt), 1751–1772. Scott Richard St. Louis, Grand Valley State University

Consisting of over seventy-seven thousand articles, the *Encyclopédie* remains a monumental contribution to Western literature for its promotion of free inquiry into all areas of knowledge and human endeavor. At least one hundred and forty contributors produced this massive corpus, but passages borrowed from other texts are occasionally included in *Encyclopédie* articles without attribution to their true authors or even acknowledgment as quotation. This is a major shortcoming for which the *Encyclopédie* has been criticized since its inception. Even so, its accessible framing of complex ideas make the *Encyclopédie* a work of enduring interest for many scholars, some of whom are now utilizing digital technology to develop new insights on the text.

My presentation will build upon the groundbreaking work of scholars Dan Edelstein, Robert Morrissey, and Glenn Roe in the digital humanities; by utilizing the search capabilities offered with a digitized version of the *Encyclopédie*, I find that their carefully designed “macroscopic” methodology must be tempered by ongoing “microscopic” analysis of digitized sources. The use of sequence alignment programs and massive online databases can yield important new insights in cultural history, but these findings must be balanced by “close” reading of documents relevant to the research question(s) at hand.

The Creek Indians in the American Revolution. Jeff W. Dennis, Southwestern Michigan College

As Colin Calloway phrases it, the American Revolution amounted to “total war” in Indian Country. Native Americans seemed the perfect enemy to many Patriots. Indians were non-Christian, non-white “savages” with extensive landholdings, who were at least titular allies of the British. While frontier Americans differed virulently over other issues, loathing Indians appeared to be one trait they could hold in common.

Patriot invasions against the Cherokees in 1776 and the Iroquois in 1779 document a far less noble account as compared to more commonly commemorated stories from the War for Independence. What happened to these two nations, moreover, happened on varying scales to other Native peoples during the Revolution. My presentation will particularly examine the Creek nation, which was the largest among any Indian people bordering American settlement in 1775.

As it did among many other Native peoples, the Revolution accentuated longstanding divisions within the Creek nation. In general, most Upper Towns became hostile to the Americans while most Lower Towns did not. Hundreds of Upper Creek warriors allied with the British during the closing years of the war, and they performed important contributions on the battlefield. Consequently, in the wake of British defeat, the whole of the nation was required to surrender significant land and autonomy as the price for peace.

“Self-Taught African Genius”: Historical Representations of Lott Cary.

Eric Michael Washington, Calvin College

Lott Cary was born a slave ca. 1780 in Charles City County, Virginia. After purchasing his freedom and that of his children, Cary along with a larger group of former slaves would leave Virginia en route to re-settle in Liberia in January 1821. This group would be the initial group of former slaves to settle in Liberia under the auspices of the American Colonization Society, founded in December 1816 in Washington, DC. In addition, the Baptist General Convention commissioned Cary to be a missionary pastor in Liberia. Though a missionary pastor, Cary would serve as a medical officer in the colony and later serve as acting governor until his untimely death in November 1828. Though Lott Cary is largely neglected among contemporary historians, it was far different during most of the nineteenth century and into the early twentieth century. Though no one wrote a full-length biography of Cary during this time, writers penned a number of biographical sketches of Cary beginning in the 1830s. This paper analyzes how nineteenth century and twentieth century writers and scholars represented Cary, arguing that these writers used their representations of Cary to promote specific social and political causes such as colonization and African missions.

John Adams and the Canadian Constitution: It’s Already Republican. Paul J.

Cornish, Grand Valley State University

In his defense of the rights of colonial subjects to be free from unconstitutional taxation, and in his participation in conversations about the constitutions to be adopted for the new states during the era of the Declaration of Independence, John Adams argued that the constitutional system of England was a commonwealth; that is, a “republic”. This study will explain the way that Adams’ understanding of the constitutional position of the colonial subjects to the English monarchy in Eighteenth Century New England might help us to

understand the contemporary Constitution of Canada. Canada's constitutional monarchy would be an example of a "monarchical republic" in Adams' framework. Reflections on this older language of republicanism may help contemporary American students of Canadian politics and comparative democratic theory to understand the varieties of contemporary constitutional arrangements that structure liberal democracy around the world.

East India Company in India: The Transition from Trading Empire to British Raj. Sam Anderson, Aquinas College

When the first English traders landed in India and agreed to set up a Factory, the English government believed they would merely use India as a stepping-stone into the East India Islands where the Dutch had control. However, over a time span of 200 years, the English began shifting their focus from trading with the East Indies to controlling the entire Indian subcontinent. The first global war between France and Great Britain sparked a move to control more of India, as finances for the English East India Company continued to fall. Political ideas changed on dominating more land through the East India Company's military to acquire more revenue through taxes. At the end of the Seven Years' War, Great Britain gained the rights of the Diwani, and effectively gained the rights to collect taxes from the Mughals. The Seven Years' War was therefore crucial in the history of British India because it allowed the East India Company to transition from a trading empire into a land based imperial power looking for more wealth and power.

Constantine's Tomb(s): Symbolic and Real Violence. Alexander Mirkovic, Eastern Michigan University

Imperial tombs in Late Antiquity carried a symbolic message intended to shape the public memory. I argue that the key to understanding the violence over the exhumation of emperor Constantine, which occurred in 359, is to understand the symbolism of imperial tombs in this period. Imperial tombs displayed imperial ideology, where the emperor is presented in the image of cosmic kingship, a second God, a unique deified person who guarantees peace and prosperity. The Constantinian building program as a whole could be interpreted as an attempt to shape a new symbolic geography of the empire and carve the place for himself and his family in the new empire. The symbolism of Constantine's tomb affected the city people in such a way that they quickly realized that there was an implied political message transmitted by the space itself and thus the crowd pressured the bishop Macedonius to exhume the emperor's body from his mausoleum as an act of rejection of the imperial ideology. Especially controversial was the arrangement where the emperor's coffin was surrounded by the coffins of the twelve apostles, thus symbolically positioning the emperor above the apostles. By a careful analysis of space I attempt here to read the political messages and explain how the space created dispositions of either loyalty or rebelliousness on the bodies and minds of imperial subjects.

A Fight So Impassioned: The Struggle over School Consolidation in Michigan, 1950–1970. Ray Jeroso, Grand Valley State University

After the Second World War, Michigan's public schools experienced a period of significant redefinition. Schools in the present-day also face similar curricular and financial challenges. This paper argues that far from being a new issue, the wave of rural school consolidations, suburban expansions, and greater role for state government in educational policy reflects a profound shift in the culture of education in Michigan. During the 1950s, declining enrollments in rural districts and the demand for new services such as special education prompted state officials to take a more direct role in education policy. To coordinate new services and to provide support and oversight, the state created Intermediate School Districts as mediating agents between communities and state government. Driven by the Cold War, increasing unease about the performance of American students internationally, and the growing crisis in urban centers, these entities took on greater roles in Michigan's education policy. At the same time, newly formed suburban districts utilized the changes in legislation to establish new districts on the periphery of urban centers often defined by ethnic and class separation. Though often handled in a technocratic and bureaucratic fashion, these policies belied the difficult choices faced by those dealing with these transformations.

Is There a “New Intellectual History” in South Africa? Jonathan G. Allen, Northern Michigan University

Several recent substantive works and methodological essays—by Darren McMahon, Mark Mazower, and Samuel Moyn, among others—indicate the emergence of a “new intellectual history”, which considers the emergence and transformation of ideas in the *longue duree*. At the same time, the history of political thought in South Africa appears to be enjoying a resurgence, as evidenced by the publication of a new edited volume on “intellectual traditions in South Africa”, as well as new work by Saul Dubow, Michael Eze, and Grant Parker. In this paper, I consider some of the substantive and methodological features of this new research—in particular, its guiding interpretive frame, “intellectual traditions”—and consider some ways in which it could benefit from and contribute to “the new intellectual history”. In particular, in addition to the venerable focus on race, class, and nationalism in South African history of political thought, I suggest that a new and supplementary focus on modernity/modernization, imperialist ideologies, and human rights discourses is likely to be especially fruitful, and will contribute to the emerging histories of human rights authored by some of the new intellectual historians.

Challenging Political and Racial Boundaries: An Afro-Brazilian Mayor of an Italian Migrant Town, 1895–1902. Nicole Magie, Olivet College

The echoes of global trends, such as the emancipation of slaves and accompanying questions of the roles of afro-descendants, were heard in Brazil and even in the small Italian migrant colony of Caxias, Brazil. Since Brazil was the last country in the Americas to abolish slavery in 1888, early Caxias wrestled with these global and national questions at the local level. At the center was José Cândido de Campos Junior, an Afro-Brazilian mayor (intendente) who governed Caxias from 1895 to 1902. Campos Junior was appointed and then twice elected to lead this predominantly Italian migrant community, despite his ongoing conflicts with the town priest. While the priest was initially run out of town after a mob assault, a few years later Campos Junior's mayoral career ended prematurely due to embezzlement accusations that he denied until his death decades later. Nevertheless, he held the mayoral position in Caxias longer than any of his contemporaries and his legacy is still debated today. This paper will use the trajectory of Campos Junior's career to analyze how political and racial boundaries were both challenged and maintained, and how this process fits within global trends.

Education of Women and Minorities at Olivet College, 1844–1932. Ture Farwell, Olivet College

The world in the middle nineteenth to early twentieth century was one where individuals were challenging the social norms of the time. This time period included social movements advancing women's rights and equality of minorities. Olivet College, a small liberal arts college in the center of Michigan, played a significant role as an early pioneer of higher education for women and minorities.

Olivet College originated as the Olivet Institute in 1844. Issues arose due to the college's anti-slavery stance and promotion of co-education. In 1859, the college received its charter and in 1863 graduated its first class. The graduating class was composed of only three woman. In 1847, a group of young women formed Soronian, a literary society. Soronian exists today and is considered the oldest inter-collegiate sorority in the United States. This presentation acknowledges and provides awareness of the contribution Olivet College has made for the advancement of education opportunities for women and minorities.

Interdisciplinary Studies

A Case-Based, Interdisciplinary Approach to Understanding Instances when People “Hear Voices” or “Talk to” Entities. Ben Bennett-Carpenter, Oakland University

The experience of “hearing voices” or “talking to” entities other than living people is common but not often openly talked about. Many people have had the experience of thinking that they heard their name being spoken from another

room in the house when, in fact, no one else was at home. It is not uncommon for some people to go through their day talking to themselves or uttering prayers. These experiences may be distinguished from psychiatric conditions and understood in terms of a common human cognitive architecture. This presentation—employing, among others, the work of Krystal (1988), Ragin (1994), Stephens and Graham (2000), Boyer (2001), Sue, Sue, and Sue (2010), Luhrmann (2012), Sacks (2012) and the author's own field research and clinical experience—briefly outlines several cases moving along a continuum from diagnosable disorders to apparently functional, “normal” instances. By taking a case-based, interdisciplinary approach to instances of “hearing voices” or “talking to” entities, we may get a more nuanced understanding of how non-psychiatric cases of this phenomenon may function for some people as a way to regulate affect, or, that is, to manage one's emotions.

Beyond Interdisciplinary Pedagogy: Participatory Action Efforts to Address Local Wicked Problems. Danielle Lake and Dana Eardley, Grand Valley State University

In contrast to static, disciplinary problems, many of the issues we face in the world today can be characterized as “wicked,” as dynamically complex, interdependent, high stakes issues with no simple or obvious definition (let alone any simple or obvious solution). These wicked problems confront us with high levels of uncertainty in situations where both action and inaction carry serious, long-term consequences. Current top-down, siloed, and abstract pedagogical strategies do not provide students with the tools for collaboratively managing such problems. How can we prepare students to tackle large-scale wicked problems within interdisciplinary courses? What pedagogical methods can be used to address interdependent, high-stakes systemic problems?

This presentation details one set of answers—from both a student and instructor perspective—by discussing the design and outcomes of “Wicked Problems of Sustainability”: an interdisciplinary, community-engaged, upper-division undergraduate course at Grand Valley State University. The inherent challenges of messy inquiry, participatory research, and community engagement will be detailed along with recommendations for meliorating these challenges and thus better preparing students to collaboratively tackle wicked problems within their own communities.

The Oxford Project as Catalyst for Literary-Ethnographic Inquiry. Stacy Graber, Youngstown State University

This interdisciplinary paper explores the way that Peter Feldstein and Stephen G. Bloom's Alex Award-winning text *The Oxford Project* (2010), sits at the intersection of literature, ethnography, and pedagogy. The book, in terms of its method of composition, provides a uniquely literary, social-scientific account of a

culture and signs to a multi-vocal, multi-modal technique for rendering local cultures visible after the critique of representation described by ethnographers (Clifford, 1988; Geertz, 1973; Marcus and Fischer, 1999). The essay progresses according to the following phases: First I discuss Feldstein and Bloom's book in terms of ethnography and its literary antecedent, James Agee and Walker Evans' *Let Us Now Praise Famous Men* (1960). Next, I analyze *The Oxford Project* from a Bakhtinian (1984) perspective as a marker of subjects' exuberance and tenacity through the identification of festival tropes. And, finally, I propose what teachers in the English Language Arts might do with this book toward stimulating the production of postmodern, ethnographic narratives, akin to the "serious fictions" characterized by Clifford (1988). Ultimately, I argue that *The Oxford Project* hails students of literature not only as consumers but producers of stories, which suggests a new permutation in contemporary, literary studies.

NSF ADVANCE Program: Enhancing STEM Faculty Diversity. Kathleen Moore, Leanne DeVreugd, Laila Guessous, Julie Walters, Joi Cunningham, and Bradley Roth, Oakland University

Many STEM (science, technology, engineering, and mathematics) faculty rosters are not representative of the current STEM major population, especially women and under-represented minorities. The National Science Foundation (NSF) ADVANCE program is supported broadly by all disciplines at NSF. In an evolving set of programs, ADVANCE funds efforts at institutional change with the goal of enhancing STEM faculty diversity. Current opportunities will be highlighted, especially the recently launched PLAN (Partnerships for Learning and Adaptation Networks) option which might be attractive to the Michigan Academy and its members. Strategies for successful proposal writing will be shared, as well as an over-view of the Women in Science and Engineering at Oakland University (WISE@OU) program. Our overall plan and its ultimate reality will be compared. Sustainability strategies will be discussed.

Combating Implicit Bias in Faculty Hiring and Review. Leanne DeVreugd, Julie Walters, Laila Guessous, Kathleen Moore, Joi Cunningham, and Bradley Roth, Oakland University

Faculty members should have confidence that they are being given full, fair, and impartial consideration when they are candidates for hiring or tenure and promotion review. Implicit bias may negatively affect the decisions of a hiring or review committee, so it is important for hiring and review committee members to have proper anti-bias training. Recognizing and understanding types of biases is essential to build a positive and inclusive academic community. To ensure fair consideration, committee members must be aware of bias and work to make unbiased decisions. Clear and fair criteria are also necessary for faculty members to know their expectations and for committee members to evaluate candidates appropriately. Sufficient definition of terms and concepts within the criteria

allows candidates and committee members to have a clear understanding of the procedures. Clear and fair criteria as well as unbiased evaluation of candidates create the ideal process for hiring and review. This presentation will address types of implicit bias, including gender bias and cultural bias, as well as clarity in criteria. Examples of these biases and productive solutions to combat them will be presented.

Mentoring Early-Career STEM Faculty. Julie Walters, Laila Guessous, Kathleen Moore, Leanne DeVreugd, and Bradley Roth, Oakland University

Effective mentoring of STEM faculty at Oakland University was an articulated goal in our proposal to the National Science Foundation's ADVANCE program. Our climate survey confirmed that in STEM areas 65% of female and 56% of male faculty 'agreed' or 'strongly agreed' that more mentoring in research was needed. The cohort of new STEM faculty in fall 2012 happened to be unusually rich with women (5 out of 8), providing us with a unique opportunity to make a lasting difference in our STEM faculty gender balance. Guided by senior STEM faculty, intensive group and individual mentoring activities were initiated. Individual efforts included: review of practical grant-related information, pre-peer-review of proposals, and individual consultations. Group efforts encompassed the 2011 through 2014 STEM faculty hires in an intimate luncheon series focused on topics critical to new faculty. WISE@OU has received enthusiastic, positive feedback from this group. By keeping a close connection to this cohort, WISE@OU has been able to craft additional workshops on mentoring STEM faculty and students, balancing teaching and research, integrating work/life, writing effective grant proposals, and facilitating interdisciplinary research. Beyond formal events, this initiative has created a comfortable network for these tenure-track STEM faculty members.

Balancing Academic Careers and Life Demands. Laila Guessous, Leanne DeVreugd, Kathleen Moore, Julie Walters, Joi Cunningham, and Bradley Roth, Oakland University

The integration of work and life demands is very challenging for faculty, especially for those in STEM areas. Across the country, academic institutions are striving to be supportive; NSF and NIH have special career-life initiatives. Review of faculty concerns, via a climate survey and focus groups, allowed WISE@OU to be pro-active in facilitating faculty satisfaction at Oakland University. By partnering with Academic Human Resources for an information session, faculty members were made aware of various leave options, as well as 'stop-the-clock' opportunities with respect to tenure. This conversation has resulted in more individual faculty consultations with respect to major life events; in addition the Q&A session was filmed, edited, and made available online. As follow-up, a joint guide on family-friendly policies is in final production. This brochure will be useful to both current faculty and potential faculty. A practical,

tips-oriented work/life workshop was presented in partnership with our teaching and learning center. Time management skills were shared and discussion was animated. It is anticipated that these activities will be sustainable beyond the life of the NSF ADVANCE grant.

Musical Borrowing and Irony in *Las Cuatro Estaciones Porteñas*: Piazzolla, Desyatnikov, Vivaldi. WayAnne Watson, Andrews University

In 1999, Leonid Desyatnikov arranged Astor Piazzolla's *Las Cuatro Estaciones Porteñas*, originally a tango quintet, for solo violin and string orchestra. Desyatnikov added to his arrangement by interspersing quotations from Vivaldi's *Four Seasons*—quotations that do not appear in Piazzolla's original composition.

Previous studies on musical borrowing and mash-up techniques have suggested that possible meanings for such use of quotations include showcasing virtuosity, reflecting cultural information overload, displaying musical humor, and blurring lines of genre distinction.

My score-based analysis of the arrangement investigates Desyatnikov's borrowing techniques by locating the Vivaldi quotations, examining Desyatnikov's alterations to their original content and context, and determining whether the quotations' identities are maintained or transformed. My research shows that, in general, Desyatnikov minimizes drastic alterations to the content of the quotations, that is, to their melodies, rhythms, and meter. But he usually makes changes to the context of the quotations, that is, to their formal locations, local dramatic effects, and textures. His borrowing techniques both minimize and increase tension between the original and quoted material, but the overall effect is one in which the quotations' identities are transformed. By examining his treatment of the quotations, my analysis provides a more nuanced exploration of Desyatnikov's musical irony.

The Contributions of Faith-Based Organizations to Development and the Humanitarian Field: An ADRA Case Study. Alexandra Raney and Joel Raveloharimisy, Andrews University

The purpose of this paper is to explain the contributions of faith-based organizations (FBOs) to development and the humanitarian field. To do this we used mixed methods research to conduct a case study of the Adventist Development and Relief Agency (ADRA), evaluating its mission, mandate, organizational resources, and activities conducted in 136 countries around the world. We argue that the contributions of FBOs to development and the humanitarian field are explained by the interplay of their identity, resources, and opportunities to do good. The paper concludes with recommendations for FBOs as we move toward the post-2015 Sustainable Development Goals, while improving delivery for beneficiaries, and simultaneously upholding human rights and their core values.

Brecht and Bob: Cabaret and the Urban Folk Music Boom 1950–1970. Jim Novak, Madonna University

In the fifty-plus years since Bob Dylan arrived in New York City to seek his musical hero Woody Guthrie and pursue a performing career, scholars and memoirists—recently including Dylan himself—have called attention to Dylan’s exposure to the work of Bertolt Brecht. Suze Rotolo, Dylan’s muse in those freewheeling Greenwich Village years, is credited with introducing him to issues and causes that soon appeared in his songwriting. Then, when Rotolo worked at an off-off-Broadway production of a review called Brecht on Brecht, Dylan became an ardent student of Brecht-and-Weill song-craft.

The influence of Brecht on Dylan as a performing songwriter is not unique to Dylan. There was a cabaret culture in New York that was a pervasive part of the urban folk boom of 1950 to 1970. Cabaret is a form of stage entertainment that originated in Europe around the turn of the twentieth century, and is associated with bohemian or anti-establishment sub-cultures. Brecht’s approach to theater shaped and was shaped by cabaret. My paper describes musical and other elements of cabaret, both European and American, that were a vivid part of the urban folk scene, and influenced a number of other folk performers (and venues, record labels, etc).

From STEM to STEAM: A Research-Based Computer Approach to Art History in a Great Books Core Curriculum. Melinda Weinstein, Cody Bellafaire, Mike Ryback, Sahil Jaggi, and Emily Foster, Lawrence Technological University

This paper provides an overview of an experiment in progress at Lawrence Technological University that introduces computer science skills into the competencies gained in a humanities classroom. As Dr. Lior Shamir and others have shown, “computers are able to perform the task of analyzing art and can expand on the way fine art has been examined, appreciated, and studied in the past.” In World Masterpieces I, a freshman-sophomore level course required of all students at LTU, students study literature and art from the ancient world to the eighteenth century. Using an experiment protocol developed by Dr. Shamir, students process digital files of paintings with free and downloadable tools such as Irfanview and wndchrm. Students can then measure similarities between groups of paintings, similarities between different painters, different schools of art, and changes over an artist’s lifetime.

While the aim of the grant is to stimulate interest and competency in computer science among women and minority students in non-STEM disciplines, I argue that the experiment also cultivates interest and competency in art historical practices and humanistic inquiry among STEM students. With the integration of computer science in the humanities classroom, all students reap the benefit of a deeper engagement with art.

Service-Learning Across the Liberal Arts Curriculum: Overview. Mary Theresa Bonhage-Freund and Anne Ritz, Alma College

Academic service-learning is a teaching methodology that integrates community service and coursework, facilitating a deeper understanding of course content. The purpose of this panel is to illustrate that it is not only possible, but beneficial, to integrate service learning across the Liberal Arts curriculum. We differentiate between service, professional development, and service learning, providing guidelines for incorporating service-learning into existing courses. Presenters focus on projects developed within disciplines ranging from business and education to social and physical sciences.

Anthropology. Mary Theresa Bonhage-Freund, Alma College

Service-learning, with its emphases on participant observation and other forms of field research, is particularly well suited to anthropology courses. Students at Alma College gain first-hand experience with issues of food insecurity, aging, poverty, ethnocentrism, and cultural-historical preservation. Projects range from simple to highly involved, according to community needs, course content, and skill sets of the participants. Examples of successful service learning projects from first year seminars, field archaeology, and anthropology travel courses are featured, as well as tips on how to re-think existing courses to incorporate service learning pedagogy.

Extending Possibilities through Service Learning. Peggy Thelen, Alma College

Service Learning in Education courses gives students a realistic and extended view of their field of interest. I want students to have a wider focus on (1) their job opportunities beyond the classroom, and (2) the world in which they currently live relative to this community, its members, and family needs (in this case, high instances of generational poverty).

Service Learning in Business. Tina Rolling, Alma College

Entrepreneurs in Action is a student organization and a class offered to students interested in helping people through free enterprise. The mission is to raise the standard of living in Mid-Michigan by teaching the principles of entrepreneurial actions through a variety of educational outreach programs developed and implemented by dedicated Alma College students. These students work in teams to complete a project objective tree that identifies the opportunity, what actions could be taken, and how these actions enable progress. The projects are worked on for the school year and assessments are prepared to reflect on how people were both directly and indirectly impacted. Measurements to capture the meaningful impact of the project and how individuals were empowered are also captured and discussed.

Exploring Business Concepts through Service Learning. Elizabeth Cameron, Alma College

This presentation discusses incorporating service learning into the business curriculum. It includes examples of successful projects incorporated into courses such as Contemporary Management, Business Communications, and Transnational Management. The presentation is intended to spark ideas, communication, and development of projects at other institutions. The success and challenges of unique projects such as Wii Play Together, Transnational Expedition, and Poetry Cafe will be discussed. Integrating service learning into business courses provides valuable experiential learning and community commitment.

Science. Melissa Strait, Alma College

Service in the sciences is often limited to tutoring. In exploring ways to use service in the classroom, several models have been explored and implemented. The Chemistry Club, along with other departments, has an outreach program to both go to the schools as well as bring students to campus to be exposed to the excitement of science. In a non-majors Astronomy course, students use the labs from class to create hands-on activities for an outreach program geared to elementary children. The college students are responsible for creating and implementing the activities. In an upper level Chemistry course on instrumentation, students propose an analysis of a local environmental problem using the skills they have learned in class. They are responsible for proposing, designing, implementing and presenting their solution to the problem. They have looked at problems such as lead paint in houses and contamination from lead shot at a local shooting club.

Secondary Education. Jenise M. Cardinal-Donnelly, Alma College

Secondary education students complete a service-learning project working with a local alternative high school faculty and students. Students work with the school's faculty to identify literacy needs, plan a project intended to meet the identified needs, collaborate to implement the plan and at the conclusion of the semester celebrate the service project's completion. Service Learning projects range from whole class initiatives, individual student interventions, to cross-curricular curriculum activities. These projects are completed during a 10–14 hour placement and provide a setting to apply the various literacy skills and strategies learned through the required course work.

Human Trafficking and Technology: A Multi-Nation Examination of Internet Use in the Trafficking Process. Ross Militz, Oakland Univeristy

This research project seeks to investigate the relationship between network-connected technologies, defined as hardware like cellular phones, other forms of telecommunications, and mobile personal computers and software like Internet

browsers and email clients that rely on a network connection to operate, and global human trafficking. The goal of this project is to develop a typology for the different implementations of technology in the course of human trafficking and assess the extent to which the different typologies exist in different global regions. The typologies will examine different elements of the trafficking itself including the user of the technology, stage of the trafficking operation, and exact form of technology. To assess this relationship, cases in the United Nations Office of Drugs and Crime Human Trafficking Case Law Database will be examined for the presence of technology-assisted trafficking mentioned in law enforcement reports and will then be analyzed to determine its fit into one of the trafficking typologies. This research aims to provide a comprehensive foundation for further academic research into the evolving relationship between technology and human trafficking.

Language & Literature (English)

Fiction: A Vehicle for Education in West Africa—the Nigerian Example.
Victoria Achufusi, Institute of Management and Technology, Enugu State, Nigeria

Literature could rightly be said to be life. Literature and society are inseparable. Literature has been an integral part of our African culture; it serves as a mirror of the society. Africans had their oral tradition before the coming of the colonial masters, but it was only oral and communal in nature. It was practiced during gatherings for the purposes of initiation, tribunals, festivities, and moonlight games. In our rural areas, story telling, that is, the oral tradition is a major source of education given to the children and even adults. Our oral tradition continues to exist and African writers now incorporate the ideas emanating from the oral tradition in their writings. Both the oral and now the written forms of literature serve for instruction, pleasure, self-realization, etc. Of importance in the African setting is the principle of instruction in literature. The aim of gathering for storytelling is not just for entertainment but for learning. This paper takes a look at the stages of the growth of literature in Africa and ways the modern African writers have used literature for the intensive exploration of our modern experience. African writers are poised to seeing to the creation of a new order.

“The Story Which He Never Stops Telling Himself”: Autobiography, Narrative Community, and the Deconstruction of Selfhood in Virginia Woolf’s *The Waves*. Melodie Roschman, Andrews University

This paper examines the relationship between narrative, biography, and selfhood as explored in pioneering British author Virginia Woolf’s experimental novel *The Waves* (1931). The novel, which Woolf dubbed a “play-poem” because

of its sensual, poetic style and interwoven stream-of-consciousness dramatic monologues, follows the lives of six friends—Bernard, Louis, Neville, Susan, Jinny, and Rhoda—from early childhood until old age and death. I trace the development of aspiring writer Bernard from his childhood habit of telling stories about his companions to his eventual failure to narrate his own autobiography, arguing that he fails not because he is incompetent, but because he does not have a self to narrate. Drawing on Jacques Derrida's theory articulated in *Of Grammatology* (1974) of the deconstructed self identifiable only in conversation, I argue that Bernard destroys his identity by silencing his friends' voices and becoming the sole speaker in the last section of the text. By articulating a theory of biography that establishes the self as only existent in community, Woolf prefigures major tenets of postmodern philosophy by more than 40 years and creates a self-deconstructing text that declares its own impossibility.

Political Intrigue in Spain in Noah Gordon's *The Winemaker*. Ronald F. Rapin, Oakland University

Although Noah Gordon is an American author who writes in English, his novel *The Winemaker* takes place in Catalonian Spain of the late nineteenth century. At that time, Spain was embroiled in a series of bloody internal wars due in large part to political entrenchments and intrigues involving a dispute over the royal line of succession, which, in turn, fueled constant bickering between the progressive and conservative factions in Madrid and throughout the country. This inability or refusal on the part of the political factions to work together and find common ground formed a prelude to the Spanish Civil War, which lasted from 1936–1939, in which almost two million Spaniards lost their lives. My paper will highlight the innovative and captivating way Gordon mixes his fiction with the historical backdrop of the time period, and will also discuss the meticulous way he researched the science—and the art—of the winemaking process itself, which is central to the plot of the novel. *The Winemaker* ultimately chronicles the life of a Catalonian family and their way of life, and Gordon's skills as an author make this work an exciting and compelling reading experience. I hope that my presentation will encourage more readers to discover it.

Racial Performativity in Naomi Wallace's *The Fever Chart: Three Visions of the Middle East* (2009): An Analysis of Power Dichotomy and Otherness. Hagar Eltarabishy, Ain Shams University, Cairo, Egypt

This paper applies Judith Butler's performativity theory on race, highlighting how racial identities in the American play, *The Fever Chart*, are constructed. Naomi Wallace's three visions delve into the thorny issue of life in the Middle East, questioning the marginalization of the Arab who is identified as the Other. Notions of reiteration and iterability, subversion of norms, and the rise of agency are theatrically at play among Arab and Israeli characters, as well as confronting the fallacies of westernized history. The paper thus sheds lights on how power is

enacted, how precarious lives are ungrivable, but yet how stereotypes could be smashed. Wallace's stage gives room to the Arabs to perform their assigned label, then gain resignification and thus power. Consequently, a struggle for recognition is at play, with an attempt to re-write history, through personalizing it. Moving between Palestine and Iraq, Wallace awakens her audience's conscience and implores them to question long-stated norms. Therefore, Butler's philosophical concepts of performing norms, then usurping power, and Wallace's theatrical tools in hope for transgression meet onstage to empower the marginalized, give the Arab a voice, resist confining norms, and fight dehumanization of lives.

Biblical Principles in Toni Morrison's *Song of Solomon*. Noah Keefer, Olivet College

This paper is on novelist Toni Morrison's *Song of Solomon*, a text that centers on race and family dynamic in the mid-twentieth century. By analyzing the Christian elements and Biblical parallels evident in the novel, readers can gain greater understanding of the African-American experience of the time.

Names and the process of naming are very important aspects in the novel, specifically those derived from Old Testament characters. Along with names, Morrison also displays Biblical ideology through circumstances in individual characters' lives. Characters' punishments and rewards are based on their alignment with Biblical principles in the story, providing evidence of Morrison's Biblical consciousness. For example, some characters are punished for greed or idolatry while another is rewarded for his sacrifices. Both Old and New Testament stories are embedded in the novel. By considering *Song of Solomon* from a Biblical point of view, readers can gain greater depth of understanding of Morrison's work.

A Main Character's Love for Language Displayed in Contemporary Literature. Jessica Doster, Olivet College

This paper displays the protagonists' love for language through their own perspective despite the varying dominant genres. Each individual's passion for words, writing, or language as a whole is examined. In these diverse novels, *The Color Purple*, *Oryx and Crake*, and *The Shipping News*, there are similarities related to different forms of love for language that are specific to each protagonist. This paper discusses all three protagonists on an in-depth level, what sparked their love for words, and how that love proved to be a refuge during their less than desirable circumstances, as well as what they gained from using language. In *The Color Purple* Celie gains confidence by writing and receiving letters. Quoye also gains a confidence boost in *The Shipping News*, but through journalism. Third, in *Oryx and Crake*, Jimmy expresses his resounding love for words through his advertisements, and language is his go-to coping mechanism as he recites words during trying times. Despite outside forces, ranging from nature to people in

general, all three protagonists rely on words for a sense of comfort and a safe haven from the poor conditions of their lives.

The American *Clarissa*: Charles Brockden Brown's *Ormond* and the Problem of Virtue. Laura von Wallmenich, Alma College

For late eighteenth-century Atlantic readers, Samuel Richardson's *Clarissa* (1748) was the quintessential seduction novel. Richardson's novel became a template for writers—not only in Britain, but in post-Revolutionary America as well. The influence of Richardson's characters on the post-Revolutionary psyche has been noted in works like Cathy Davidson's *Revolution and the Word* and Elizabeth Barnes's *States of Sympathy*. Allusions to Richardson's plots and characters can be found in the works of Rowson, Brown, Foster, Tyler and even John Adams.

Nevertheless there has been surprisingly little sustained analysis of how post-revolutionary writers define themselves through and against Richardson's work. In this respect, one of the most compelling early national refigurations occurs in Charles Brockden Brown's novel *Ormond* (1799). Brown's novel draws on and revises the most dramatic scene in *Clarissa* and uses it as the climax between Constantia and the libertine Ormond. Brown's deliberate evocation of this scene deserves more careful scrutiny, both in terms of what it suggests about Brown's own critique of the (gendered) limits of Richardsonian virtue as well the limits of Richardson—and the seduction novel—as a template for an American novel.

Gender, Family, and Morality in Ben Jonson's *Volpone*. Shanelle Kim, Andrews University

During the sixteenth and seventeenth centuries in England, the transformation in categories of value resulting from a money economy clashed with older forms of institutionalized values—the family unit and religious morality. Ben Jonson's dramatic satire *Volpone* (1606) diagnoses social ills arising from the emerging proto-capitalist culture of his time. Though Jonson critiques the corrosive impact of a money culture, his play offers little viable defense against its power. No agents of good manage to silence the opportunistic voices in his drama—rather, the immoral are silenced by the consequences of their own schemes. The two distinct embodiments of moral good in Jonson's play, Celia and Bonario, prove ineffective in battling the creeping value transformations associated with money; in part, their failure derives from systemic fissures in Early Modern understandings of the family unit and gendered roles within such a structure. Celia as wife and Bonario as eldest son and heir occupy distinct gendered family roles that hinder their respective abilities to combat eroding morals and encroaching economic change. The rhetoric and actions of Celia and Bonario work to create an unsettling picture of morality and traditional family structures ill-equipped to deal with the negative effects of avarice.

Helena's Rhetorical Strategy in *All's Well that Ends Well*. Sara Austin,
Andrews University

Many of Shakespeare's female characters gain agency through the artifice of disguise or deception, therefore, instances where female protagonists achieve agency as women and retain that agency through the entirety of the play merit examination. *All's Well That Ends Well* differs from other plays because Helena exerts her own agency from the beginning as a woman. She does so with a rhetorical strategy that masters both masculine and feminine authority—masculine authority with her dealings with the king, and feminine authority in her interactions with Diana and her mother. Helena addresses the king undisguised and arranges her own marriage to Bertram, making it clear to the king that she is her father's heir. Helena convinces both Diana and her mother to help her achieve her goals by relating to them through the common plight of females. Helena's ability to exert both male and female authority ensures that she will gain Bertram as a husband by the end, and solidifies her agency, guaranteeing that she will remain able to move through both modes of femininity and masculinity as herself. Helena recognizes the necessity of masculine authority and understands the importance of female community to the assertion of female agency.

Suhrawardi's the *Epistle of the Bird*: A New Reading. Navid Saberi-Najafi,
University of California, Davis

Shihab al-Din Yahya Suhrawardi was a twelfth-century Persian philosopher and mystic whose beast literature, which casts light upon his philosophical and mystical thinking, has not been sufficiently studied up to the present time. This paper aims to do a new reading of Suhrawardi's Persian translation of Avicenna's *Risalat al-Tayr* (*The Epistle of the Bird*) by arguing that Suhrawardi's conception of the journey of the soul to the divine realm is mysticophilosophical; in this bird allegory, Suhrawardi attempts to show the various stages of the journey of the soul by deploying philosophical and mystical concepts. This paper argues that although the human pilgrims—who are represented as birds—make use of their practical and theoretical intellects to grasp the deepest spirituality—the divine luminosity—at the end of their journey, their mysticophilosophical efforts fail, forasmuch as they realize that first and foremost, the shackles of the carnal soul (*nafs*) need to be removed before perfect communion can take place.

Juliet, Tumblr. Kirk Hendershott-Kraetzer, Olivet College

Performing a simple "Juliet" search on Tumblr turns out to be far from a simple act, one that results in a bewildering, polyvalent display of accounts that Tumblr suggests one might follow; a constantly expanding array of posts hashtagged with "Juliet" or whose titles contain the word "Juliet" in some form

or another; and individual posts which themselves contain Juliet-related text, still images, GIFs, memes, embedded videos, or some combination of these.

Continuing previous work on constructions of Juliet in popular culture (in one-hour scripted television dramas and on Facebook), I will examine ways in which Tumblr constructs the character Juliet and assess the implications of these constructions on how a user might understand this complex character. Included will be an attempt to explain the nature of Tumblr itself: while it would be easy to write off the Tumblr Juliet as a Jamesonian pastiche, it is worth assessing whether the platform and its representations might more productively be described as a mosaic, a traditional pastiche, a post-modern parody of a pastiche, even a kind of post-modern panopticon in which an all-seeing observer struggles to completely see an unruly assemblage that endlessly strives to exceed the bounds that contain it.

Accenting Allusions: Ideologies That Shape “The Legend of Sleepy Hollow”. Jessica Bigelow, Alma College

The critical history of Washington Irving’s “Sleepy Hollow” reveals several key trends in interpretation. New Critics tended to focus on formal elements and dismiss this story, seeing it as the work of an “immature” writer. However, by the 1960s, it was increasingly read through the lens of early national culture, and specifically as commentary on the conflict between Yankee New England and Dutch New York. Since Donald Ringe’s seminal essay in 1967, we have tended to view this piece as a critique of New England’s capitalist ideologies. Nevertheless, scholars have fairly consistently overlooked the ways formal elements, specifically allusions, provide a key to contextualizing the way we read Irving’s interest in the conflicts between the Yankee and Dutch-Americans. “Sleepy Hollow” contains allusions to texts like *King Lear* by Shakespeare, *Don Quixote* by Cervantes, *Hudibras* by Butler, and “L’Allegro” by Milton, that reframe the text by locating the true object of satire to more universal human tendencies that lie beneath the apparent differences of region and ideology.

Quebec-Lebanon: The Cinema of Maryanne Zehil. Vincent Desroches, Western Michigan University

Maryanne Zehil is a Quebec-based filmmaker of Lebanese origin. In her first feature film, *De ma fenêtre sans maison* (*From my window without a home*), Zehil portrayed complex characters of immigrant women struggling between two spaces and two identities. Returning to the territory of childhood provokes a confrontation with a more traditional and patriarchal society. This paper analyses the resolution of these identity conflicts as well as the innovative cinematic approach of this filmmaker.

Sin, Fall, Redemption: Through the Arc of the Rain Forest and Man’s Fall from Grace. Greg Botting, Alma College

Karen Tei Yamashita's magically realistic novel *Through the Arc of the Rain Forest* has been read by scholars primarily as Asian-American and/or environmental literature. What has not been explored in detail is how religious elements contribute to the novel's message of the dangers of human industry and progress.

This paper examines how Yamashita uses religious allusions—specifically those of the Garden of Eden myth—to read the main characters as symbolic: the head of American Company Jonathan B. Tweep as both God and the Devil; the Japanese hero Kazumasa and his Brazilian housekeeper Lourdes as Adam and Eve. The Garden of Eden allusions carry not only the warning against the exploitation of the Amazon but also what possible redemption is available for humanity.

A Novel Metaphor: Rahman's *In The Light Of What We Know* and the Novel as a Cognitive Tool. Erik Bond, University of Michigan-Dearborn

Given the popularity of cognitive science and its implications for understanding how we read, literary metaphors have received increased attention as the foundational building blocks of knowledge not only in the humanities but also the sciences. No longer optional “things of beauty,” metaphors are so essential that it has become commonplace to assert that “there can be no metaphor for a metaphor.” In this paper, I argue that Zia Haider Rahman's 2014 novel *In the Light of What We Know* disproves this claim about the transcendental nature of metaphor. Rahman uses narrative, or the ordering of events, to help readers experience metaphor not as a static product, but as a “shuttling” of meaning from known vehicles to unknown tenors. Narrated by two Oxford-educated Muslim mathematicians raised beside a Taliban-riddled Afghanistan and coming-of-age during the 2008 economic crisis, Rahman's novel shows how knowledge about economics, nationality, math, and gender are similarly produced. Rahman's narrative ultimately suggests that if we can only describe truth “in the light of” what we already know—or, if new knowledge carries the weight of past truths—then we must be aware of the shadows that accompany this light, especially in our inheritance of violence against women.

Containment and Enclosure: Causes of Retaliation and Revenge in the “Manciple's Tale”. R. Andrej Kis, Andrews University

Chaucer's “Manciple's Tale” has often been studied as a tale of speech and language. Research has focused on the use and abuse of speech as a cause of discord, and the creation of sexual relationships and tattling. Other studies have focused on legality regarding harm and homicide, and hierarchical roles of power within relationships. This study focuses on containment and enclosure and the retaliation and revenge that frequently follows as a result. I have identified three types of enclosure throughout the tale: physical (concrete), biological (anatomical), and behavioral. These enclosures appear at different times, at

various stages, and emphasize particular issues, thereby directing the course of the tale. Typically, each enclosure is followed by a reaction of grave consequence.

Going, Going, Gone: Understand the Idea of Evil and the Unset Definition.
Heather Kennedy, Olivet College

Recent research indicates that popular conceptions of evil are often simplistic in nature. For example, David Bruce Forbes, in “Battling the Dark Side: Star Wars and Popular Understanding of Evil,” explores ways in which popular entertainment, like Disney movies and Star Wars, exemplify the three main trends in this simplification: the externality of evil, the dualistic evaluation of persons as good or evil, and redemptive violence as the solution to evil. Building on Forbes’ analysis, I argue that these simplifications do not adequately represent the nature of evil and the effects that evil has on a community. Drawing on philosophical and religious analyses, and including a linguistic examination of the denotative and colloquial meanings of evil, I analyze the ways in which Horace Walpole’s *The Castle of Otranto*, Mary Shelly’s *Frankenstein*, William Peter Blatty’s *The Exorcist*, Stephen King’s *Salem’s Lot*, and Thomas Harris’ *Red Dragon* explore a concept that is central to our understanding of our culture and ourselves. While it would be easier to write of popular horror novels as written strictly for entertainment, these novels are actually mature, thoughtful representations of the nature of evil and the individual and social consequences of evil in the world.

Werewolves: Your Sexaholic Doppelgänger. Ashley Milheim, Olivet College

While it would be easy to write off werewolf novels as pulp fiction smut, a closer reading reveals that these texts, whose readership and content range from young adult romance to adult erotica, contains themes from the stereotypical fetishizing of male and female bodies, to interrogations of individual and social attitudes towards race, inter-racial relationships and identity, to the full range of human sexual expression, from tender, heterosexual tween emotionality to gay, bisexual, and BDSM explorations. The genre allows readers to test sexual fantasies that would be considered “taboo” or would make their partners uncomfortable if brought to the bedroom. Similarly, werewolf novels allow their readers to comfortably explore potential anxieties about racial “purity” or their positions in inter-racial relationships and in a diverse, multi-racial society. Rather than simply being trashy, guilty pleasures, these novels make it possible for readers to have thought-provoking literary conversations while letting their hair down and getting a little wild.

“Coquetry is the Salt and Pepper of Love”: A Study of Metaphor in American, Turkish and Mexican Pop Songs. Maria Cupery, Calvin College

This paper analyzes the use of metaphor in American, Turkish and Mexican pop songs using Zoltan Kovecses’ division of metaphor into structural, ontological

and orientational categories. The goal is to increase our knowledge about how metaphors are used in an informal, culturally prevalent discourse type.

The paper compares the song sets in the areas of structural metaphors for love, body metonymy where a body part represents an emotion, ontological metaphors for emotions, and up/down and close/far orientational metaphors. These metaphors are compared in several ways, including the preferred grammatical person in the love metaphors; the degree of sexualization in the body metonymies and the use of possessives with the metaphors for emotion, along with the cultural implications of these data.

These data are then used to both extend and qualify Anna Wierzbicka's argument that languages are prisons that prevent their speakers from understanding other perspectives. She argues that vocabulary carries cultural constraints; her argument is extended to metaphors. However, the wide variety of metaphors within each data set also shows that every language contains a variety of ways to conceptualize the world and that a language does not inhibit its speakers from understanding other perspectives.

The Play's the Thing: Shakespeare's Response—*The Merry Wives of Windsor*. Robert Lamphear, Oakland Community College

The oft maligned, yet oft produced *The Merry Wives of Windsor* offers perhaps the purest insight into Shakespeare's creativity. Understanding the play's origin—the request of the people and the Queen to resurrect the beloved Sir John Falstaff of the *Henriad*—helps clarify Shakespeare's play as his response. An in-depth analysis of what actually does occur within the text of the play will reveal the play's magnitude, as a remark to his critical colleagues as well, and its originality. The play's correlation to a piece of popular culture will help demonstrate its eternal relevance.

Queer Challenges to Heteronormativity in Lawrence's "The Horse Dealer's Daughter". Gerhardt Schuette, Saginaw Valley State University

D. H. Lawrence has often been critiqued for the way his work privileges patriarchal gender roles and the misogyny in his depictions of relations between men and women. However, in "The Horse Dealer's Daughter," D.H. Lawrence openly challenges assumptions of heteronormativity and patriarchy that provide the basis for the systematic oppression of women. By analyzing the text as both a whole and as composed of three distinct spaces (familial, internal and intimate) of conflict, this analysis isolates moments of non-normative gender performance and queer subjectivity in the text. Through a close reading of resistance to gender in the familial scene and homosexual desire in the water scene, this analysis aims to provide a reading of the intimate scene between Jack and Mabel as one in which each resists internally but acts according to the performative expectations they perceive in the other's gaze. Thus, Lawrence's text illustrates the inability for

both men and women to act in accord with personal desire as they are driven to act in accord with the expectations of a patriarchal society.

But What ARE You? Examination of Post Colonial Ambivalence in Zadie Smith's *White Teeth*. Alyssa Cooper, Alma College

If you are born in England, are you English? What if you don't look English? Do you still belong? The characters in Zadie Smith's *White Teeth* face these questions on a daily basis. In my paper, I examine the way these questions permeate the third generation of characters, the children Magid, Irie, and Millat, and how these questions lead to ambivalent positions within society. I use post-colonial ideas to understand the struggle of displacement that all the children face. These children spend their younger years in London and have at least one parent who is not British, allowing the reader to view the struggles of growing up as an outsider in one's home country. Magid exemplifies Homi Bhabha's idea of mimicry through his desire to appear more Western, despite his Bangladesh heritage. Robert Young's idea of hybridization is seen in the character of Irie, who is herself a hybrid and struggles to relate to either side of her family. Millat demonstrates Bhabha's concept of the unhomely, as he cannot figure out what constitutes his home and how he fits into the world, thus feeling like he has no place. Post-colonial ideas highlight their feelings of ambivalence within society.

Broken English or Creative Construction? The Case for English-Based Korean Youth Slang. Eun-Young Julia Kim, Andrews University

Considering that slang is a rich resource that not only exhibits linguistic innovation and rapid change, but is often created and used by young people, a close look at its formation would reveal valuable insights into the development of new varieties of English in the current generation. Various slang terms are created and used by Korean youth to describe and manage their fast changing environment where Korean and English constantly intersect. The increased usage of Anglicism in the creation of slang undoubtedly reflects the rapidly changing reality, in which English plays an important role in the daily communication of Korean youth. This paper provides an overview of commonly used Korean youth slang terms that have been influenced by English. It illustrates how freely and boldly the Korean youth code-mixes in everyday life by adopting, creating, and recreating their language through various creative processes. It also demonstrates that many of the slang terms, often pejoratively called Konglish, have become widely adopted in the mainstream media. By discussing the widespread usage of English-based slang in various channels of communication, this study seeks to demonstrate that the dividing line between standard and non-standard expressions is fluid.

Marked for Life—Discrimination and Reconciliation in *Valley of the Innocent*. Asili Mugei Deeb, Wayne State University

In my paper I analyze Branwen Okpako's 2006 film *Valley of the Innocent* to uncover the ways in which black women in Germany have been confronted not only with German society's oscillation between the acceptance and rejection of the "other" but also the complex dichotomy that exists between Germany's failure to fully overcome its racist past and the desire to accept individuals who are not part of the white majority. This close analysis highlights the relevance and prevalence of these issues for black people. Furthermore, by embedding my analysis within the historical context of blacks in Germany, I also show how absurd ideologies from the past affect the protagonist, Eva Meier, i.e., black women today. The remnants of the Nazi and Communist regimes greatly impact Eva and the representations of these histories in the film make apparent Germany's ongoing struggle to come to terms with its past. While grappling with her isolation as a minority she simultaneously embarks on a lonely journey in search of her identity and biological family, during which she uncovers several shocking secrets.

Starved for Words: Modern Irish Literature's Opposition to Imperial Silencing. Jacklene Johnson, Marygrove College

Language carries human culture within its matrix; it specifically carries identity. The act of colonizing disrupts and appropriates indigenous cultures. Bram Stoker, Samuel Beckett, and Brian Friel are modern Irish writers who purposefully used language to oppose the language of the colonizer. This paper discusses how language opposes England in *Dracula*, *Waiting for Godot*, *Endgame*, and *Translations*. Critics typically view *Dracula* as a gothic novel that uses reverse colonialization to highlight the fears of England, a declining world power, as it faces threats from rising powers like the United States. Stoker uses various forms of language from journaling to shorthand as weapons against the oppressor. While Stoker's characters have much to say, Beckett's characters have almost nothing to say. The discussion on Beckett's plays centers on his sparse use of language as a form of protest against England's usurpation of the Irish language. The concluding discussion focuses on the most graphic depiction of colonialization and its impact on the Irish language. Brian Friel's play *Translations* reveals how England used the Ordnance Survey to strip away more of the Irish language by replacing Irish place names with English translations; this play demonstrates that losing one's language erases at least part of one's identity.

Boris Pasternak's "Translations of Shakespeare's Plays in Criticism".
Svetoslav Pavlov, Grand Valley State University

After translating *Macbeth*, Boris Pasternak wrote in 1951 that the longevity of his translations of Shakespeare's plays (eight in total) would be between 30 and 50 years. Today we can definitely say that Pasternak's translations have exceeded his expectations. His rendition of *Hamlet* is as popular among Russian theaters and publishers as it was during his lifetime. Furthermore, it has not been eclipsed

by any subsequent Russian renditions of the play. Despite all that, the critics' opinions of Pasternak's translations have always been conflicting, ranging from admiration to disapproval. This study identifies patterns, similarities, and differences in the criticism of Pasternak's translations of Shakespeare's plays.

Law

Trending Compulsory Binding Arbitration: Boon or Bane. Henry J. Hastings, Eastern Michigan University

When interpreting federal and constitutional law, the United States Supreme Court has the final word. The current Court is commonly considered to be comprised of five conservative justices and four liberal justices. Their respective ideologies often determine how a justice will interpret the law. In making its decisions, the Court will try to find common ground, however, many of its opinions are drawn along ideological lines.

This ideological divide was particularly evident in an important series of three Court decisions in the last four years interpreting the Federal Arbitration Act (FAA). These decisions greatly expanded incentives for businesses to employ arbitration agreements. The conservative majority created an expansive view of the FAA favoring business, while the minority was concerned about the effect of this expansion on consumers or employees. What does this esoteric legal argument portend for businesses and consumers?

This presentation will examine that question and the Court's ideological divide in these three cases. At its best arbitration may be a benefit to both business and the consumer, but there is a growing potential that compulsory binding arbitration may deprive consumers of an opportunity to effectively remedy unfair or deceptive business practices.

Mass Incarceration and Its Collateral Consequences: Finding Solutions in the Academy. Heather Garretson, Western Michigan University Cooley Law School

Over 45,000 people are currently incarcerated in Michigan. More than 95% of them will be released. When they are, society expects them to reenter their communities, get jobs, and become tax payers rather than tax burdens. Many will fail and return to prison. Michigan will keep spending one out of every five state dollars on corrections. Imagine the solution being in the academy.

Our institutions of higher education are uniquely situated to identify, research, and implement successful reentry strategies. Mass incarceration, reentry, and the collateral consequences of a conviction are impacted by education, employment, poverty, and public policy—areas our departments of education, business,

economics, political science, and social work already specialize in. Utilizing these specialties will promote synergy across fields and spur innovation. The academy can create efficient partnerships between disciplines, researchers, policy makers, and business leaders to promote successful reentry. With the academy as the umbrella, collaborative minds can inspire, manage, and evaluate policies and projects. Published findings can provide communities, practitioners, and policy-makers with cutting edge tools and expertise to address mass incarceration and reentry.

The solution sits with us; the academy can have a massive effect on mass incarceration. My research starts this critical discussion.

The WMU Cooley IEP Project: Engaging Students and Empowering Families. David Tarrien, Western Michigan University Cooley Law School

Determining appropriate special education services for children is a complex endeavor. The issues addressed do not always lend themselves to an amicable, streamlined process. Indeed, the arcane nature of the statutes and rules surrounding IEPs often seem at odds with a caregiver's eagerness to ensure academic success for a beloved child. Practical matters, too, such as financing for much needed services for the few while ensuring fair access to educational resources for all students, can set the stage for miscommunication, mistrust, and bad or hurt feelings on both sides of the table. Meanwhile, the affected children languish. Further, because lack of funds tends to be a key issue, there often is a dearth of effective advocacy available to help the process move forward.

Law students can use their advocacy and dispute resolution skills to help the involved parties be their most reasonable selves and keep children in the place of primacy rather than adult egos. This paper explains how one program, the IEP Project out of WMU Cooley Law School, achieved these aims while developing in the law students a sense of responsibility to the community they are a part of by serving some of its most at-risk members.

Stop, Question, and Frisk. Kendall Wilson and Joel Raveloharimisy, Andrews University

This research paper will examine ways in which it may be possible to build resilience amongst the minority community, primarily African Americans and Latinas, in regards to the Stop, Question, and Frisk law. This law and police practice of the Stop, Question, and Frisk law in New York City has violated human rights. The current residents of New York City, especially minorities, have had their constitutional rights, specifically the 4th and 14th amendments, which are designed to protect them from unlawful searches and seizures along with stating that all men are equal, being violated. Using racial profiling, the police have constantly harassed many minority citizens, forcing them to the brink of fear and distrust towards their local law enforcement. Through building resilience in

the minority community, people will be able to protect themselves from these ongoing actions they have now been perplexed with. One way in which this may have the chance or opportunity of being obtained is by making sure that the citizens are fully educated about their rights as American citizens. Knowing what they are obligated to do as a people can give them a fighting chance to decrease the casualties and negative repercussions.

Library & Information Sciences

Plagiarism and Research Misconduct in Cuba: Incidence and Awareness.
Edward J. Eckel, Western Michigan University

A field research trip was undertaken to the city of Santiago de Cuba in July 2014 to explore research integrity and academic integrity issues at the University of Oriente. Semistructured, qualitative interviews were arranged with three faculty members at the university, as well as two recent graduates. This project explored whether university faculty and students have personally witnessed or experienced plagiarism or research misconduct. In addition, the researcher gathered background on ways librarians and professors educate their students on ethical research and writing practices. The interviews revolved around the following research questions: How does the university teach its students and faculty about research ethics and academic integrity? Does the institution have a formal or informal academic integrity or research misconduct policy? What kinds of issues regarding academic misconduct or plagiarism have come up? Finally, what is the role of the academic librarian with regards to research skills and integrity training? As in the United States, enforcement of academic and research integrity policies at the university was found to be contingent and contextual, with follow-through varying. Academic librarians were found to have to no significant role in the educational and research life of the university.

Makerspaces in Academic Libraries. Arlene Weismantel and Jonah Magar,
Michigan State University Libraries

Makerspace services have been growing in academic libraries. The purpose of a makerspace is to provide an area for students to experiment and learn by doing. Makerspaces provide a variety of materials, tools and software to facilitate the creative process including 3D printers and scanners, laser and vinyl cutters, arduino kits and more. This presentation will review makerspaces in academic libraries, including the services and tools offered and how they support academic work. In addition, the speakers will discuss the makerspace at their library and how decisions were made about staffing, services, tools and materials offered.

Web Archiving: Saving What We Do Today for the Future. Maira Bundza,
Western Michigan University

It has been noted that the beginning of the last century is better documented than the beginning of this one. We know how quickly information changes on the Web and how easy it is to lose valuable information on our computers. This presentation will look at the evolution of the Internet Archive, the International Internet Preservation Consortium, and current web archiving efforts in certain countries and at large United States institutions. There are interesting issues around selection, harvesting, storage and making the archives available to the public. Western Michigan University's efforts to implement web archiving will be discussed.

Health Sciences Librarianship Goes Mobile: Using the MS™ Surface Pro 2 to Deliver Instruction and to Access Medical Content. Elizabeth Bucciarelli, Eastern Michigan University

In 2013, the Eastern Michigan University Library purchased three medical ebook collections to support the research needs of its new Physician Assistant and Clinical Nurse Practitioner programs. These collections are intended to be accessed on mobile devices such as smartphones and tablets, so that they may be used in the moment at the bedside or in the clinical setting. In order to determine how best to integrate the ebook collections into library services for these new programs, I applied for and received a MS™ Surface Pro 2 tablet from EMU's Faculty Development Center's eFellows program.

Over the last year, I performance-tested the MS™ Surface Pro tablet regarding its utility with: (1) the ebook collections' functionality features; (2) free National Library of Medicine, vendor, and Microsoft™ medical apps; and (3) the provision of group and individual research instruction sessions. In this presentation, I will share my experiences with MS™ Surface Pro 2 as a device to access and deliver content from medical ebook collections in both clinical and classroom settings, and as a tool to provide library group instruction.

From Serving Them to Serving with Them: An Embedded Librarian's Perspective. Karen Liston, Wayne State University Libraries

The emerging trend of embedded librarianship represents a continuously changing spectrum that differs with each individual librarian's unique relationships with the learners and instructors they serve. Exactly what is "embeddedness?" What are its benefits and challenges? and How does it differ from the prevailing "liaisonhip" model? What attitudes, supports, assistance, and technologies are useful in promoting embeddedness, and what concrete steps can librarians take to begin or to become more embedded?

A seasoned librarian will facilitate a session in which she'll share some of the changing roles, mindsets, approaches, and strategies that are increasingly embedding her into the daily work of her clients. This session's attendees will be involved in generating ideas that can serve as next steps in moving along their

own “embeddedness spectrum,” project strategies and goals for embeddedness for which librarians can strive in the future, and perhaps even imagine a future role for librarians beyond embeddedness.

Digital Curation of Archival and Special Collections. Arjun Sabharwal, Ward M. Canaday Center for Special Collections, The University of Toledo

Digital curation is an important concept in the archival profession; yet it is misunderstood in and beyond that profession. As archives engage in digital preservation, it appears that non-digital records go unnoticed, underused, or unused. There is also a broad and misinformed expectation that everything is on the Web. With archives that may not always be true.

What can archives do to close the gap between reality and myth? One of many roles for digital curation is to build a bridge for researchers between the digital and non-digital collections through a digital collection development, enhanced metadata practices, and improved finding aids for better access to institutional knowledge regardless of the form. As digital curation is also focusing on the preservation of born-digital materials in archives and libraries, archives can aim to create an epistemic bridge between conveniently accessible digital media and formidable but non-digital records requiring onsite use.

This presentation focuses on the role of digital repositories, digital finding aids, and virtual exhibitions to expand digital curation into such a necessary direction, as knowledge—for all intents and purposes—cannot be limited to either digital or non-digital formats; instead, it must span an entire ecosystem of records in all formats.

Building Community in the Academic Library: Exploring Commuter Student Experiences. Laura S. Manley, Marygrove College

Often referred to as a neglected population (Knefelkamp and Stewart, 1983), commuter students face many challenges different from that of residential students. Because of these challenges, commuter students have a lower rate of retention than residential students. Retention research has shown that students who feel as though they are part of the college community have a higher rate of retention (Spady, 1970). Since the library is a central hub of campus activity, it is a natural assumption that community building activities take place within the library. Libraries have become more active in helping with institution-wide efforts at increasing student retention. In spite of the role libraries play, they tend to have difficulty measuring their impact. One way the library can measure its impact is to take a holistic approach to measuring the value of its services through qualitative research methods.

The purpose of this presentation is to present the results of a study which explored how commuter students build community within the context of the

academic library. Using McMillan's and Chavis's (1986) theoretical "Sense of Community" framework data were collected using three qualitative research methods: focus groups, unobtrusive direct observations, and interviews with professional librarians.

Mathematics

Mathematical Model on Effect of Immune Systems on Avascular Tumour.

Georgina Chibuzo Okpala, Institute of Management and Technology, Enugu State, Nigeria; G. C. E. Mbah, University of Nigeria, Nsukka, Enugu State, Nigeria

In this paper we developed models that describe the behaviour of these cell populations when no drug is administered to the patients using system of differential equations. It is assumed that the tumour is in avascular stage, that is benign tumour can be fought and controlled by the immune systems. Here tumour cell growth interacts and fights with a normal killer (NK), CD8 T cells, circulating lymphocytes, immunotherapy which are the body immune system. This is done with the goal of understanding the dynamics of tumour cells and its control by the immune system using system of differential equation. The function describing tumour cell growth response and interaction rate as well as mathematical terms that represent tumour growth in response to immune system was developed. Benign tumours do not invade other tissues and are limited to one site making control easy. Nearly all benign neoplasms grow as cohesive expansive masses that remain localised to their site of origin and do not have the capacity to infiltrate. Benign tumours are not harmful and dangerous to life, although they may cause a great deal of pain and even death when situated in some sensitive or delicate organ. A benign tumour is rounded in shape.

When Mathematicians Grade Students' Proofs, Why Don't the Scores Agree? Robert C. Moore, Andrews University

This presentation reports on a study of practices that mathematics professors use to grade undergraduate students' proofs. An initial study explored mathematics professors' proof evaluation practices and the characteristics they value in good proof writing. Four mathematicians evaluated and scored six proofs of elementary theorems written by students in a discrete mathematics or geometry course. The study found that the professors generally agreed in their overall evaluations of the proofs with their focus on logical correctness, clarity, and the student's level of understanding. But the data also revealed that despite this agreement, the scores the professors assigned to the proofs varied substantially. A follow-up study delved more deeply into the reasons for the spread in the scores and identified four reasons why the professors did not always agree in their scoring of the proofs: (a) performance errors, (b) disposition toward grading, (c)

judgments about the student's level of understanding and the seriousness of errors, and (d) contextual factors. These reasons will be discussed in the presentation.

Teaching Elementary Statistics in the Informatics Age. Naim Saiti,
Davenport University

The transition from the industrial to the age of informatics has made a huge impact on statistics, demanding different skills from the workforce today. Becoming an integral part of production today, computer should also be essential in teaching statistics. The philosophy of statistics is fairly independent of mathematics behind it, so it can be taught separately from it. The focus in teaching should be shifted from computations to understanding ideas. The computer provides us with numbers, and we, as users, focus on how to feed it, run it, and interpret the results.

What defines statistics as a separate discipline of probability is use of a sample to study a population. In logical terms, it amounts to partial induction, which is an unacceptable way of thinking in science. However, making a sample a representative part of a population, and coming up with a probability of reaching an erroneous statement, has made statistical thinking prevalent in business and science.

Each of four parts of a typical elementary statistics course is centered around sample, with an exception of probability and random variables. Yet, that part connects to the main idea in statistics: comparing the observed to what would happen by chance.

Remedial Math Journeys, Part II. Lynelle Weldon, Andrews University

In 2001–2003 the remedial mathematics courses at Andrews University shifted from traditional lecture delivery to individualized computer-based delivery within a computer classroom. This course has continued to evolve over the last eleven years in an attempt to better meet the needs of the students. Recently math placement has switched from using a paper-based exam to primarily using ACT/SAT scores. We continue the analysis of how these changes have impacted the math journey of our remedial math students.

Equivalent Mathematical Conditions for Survivals of Species of Animals for the Most General Population Models. Joon Hyuk Kang, Andrews University

We investigate mathematical conditions for existence of positive solutions to a system of elliptic partial differential equations. As an application, these results illustrate when both of two species of animals residing in an environment can survive (coexist) in various situations in mathematical point of view.

A Model of a Spring-Mass-Damper System with Temperature-Dependent Friction. Meir Shillor, Oakland University

This talk describes a model and its analysis for the dynamics of a general spring-mass-damper system that is in frictional contact with its support, taking into account frictional heat generation and a reactive obstacle. Friction, heat generation, and contact are modeled with subdifferentials of, possibly nonconvex, potential functions. The model consists of a nonlinear system of first-order differential inclusions for the position, velocity, and temperature of the mass. The existence of a global solution is described and additional assumptions yield its uniqueness. Some examples of conditions arising in applications, for which the analysis results are valid, are presented.

Riemannian Submersion Invariant and Theta-Slant Submanifolds. Yun Myung Oh, Andrews University

A θ -slant submanifold N_n of an almost Hermitian manifold M_m is a submanifold such that the angle $\theta(X)$ between JX and the tangent space TpN is constant for any nonzero vector X . If the angle is zero, it is called a complex submanifold and if the angle is 90 degrees, then it is called totally real (Lagrangian if $m=2n$). It is very interesting to investigate the connection between this isometric immersion and the Riemannian submersion in the way we have seen in the Lagrangian submanifold. Some notes and results will be discussed.

Mathematically Modeling Prokaryotic Speciation. Michael Culver, Fabia Battistuzzi, and Anna Spagnuolo, Oakland University

Astrobiology sets out to address deep questions about our existence; how did we get here, is there anyone else, and what is the nature of our future? Prokaryotes, unicellular organisms that lack a nucleus, could play a big role in helping us answer those questions. In this talk, the derivation of a mathematical model for prokaryotic speciation, the effects of the transition from an anoxic to an oxic (oxygen lacking to oxygen having) atmosphere on prokaryotic speciation, and differences between speciation in the prokaryotic subgroups Hydrobacteria and Terrabacteria will be discussed. The model makes use of the continuous nature of evolution and contains ordinary differential equations, using data from time-scaled molecular prokaryotic phylogenies. Computer software is used to visualize the solutions to the model. Algorithms were developed to compare the empirical data (from molecular phylogenies) to baseline hypothetical phylogenies. The derivation and solutions of the model allow for a deeper understanding of prokaryotic speciation, and the effect oxygen has played as an evolutionary driving force (selective pressure) in prokaryotic speciation.

Arrangement of Cubical Sets and Application of Gröbner Basis. Rostam Sabeti, Olivet College and Lansing Community College

For each elementary cube P and $0 \leq i \leq k$, we construct a set of monomials $M(K_i(P))$ and an ideal I_i generated by this set. For any admissible monomial order,

if $G_i = G(I_i)$ is the reduced Gröbner Basis of I_i , then G_i is generated by those generators of I_i that are associated with the elementary cubes and constitute the maximal i -lower hull of P .

A Mathematical Model for *Vibrio cholerae* Colonization of the Human Intestine. Anna Maria Spagnuolo, Oakland University; Victor DiRita and Denise Kirschner, University of Michigan

Vibrio cholerae is a strict human pathogen that causes pandemic cholera. It is an old-world pathogen that has re-emerged as a new threat since the early 1990s. *V. cholerae* colonizes the upper, small intestine where it produces a toxin that leads to the watery diarrhea characterizing the disease. Colonization dynamics of the bacteria are largely unknown. Although a large initial infectious dose is required for infection, data suggest that only a smaller sub-population colonizes a portion of the small bowel leading to the disease. There are many barriers to colonization in the intestines. In this talk, I will elaborate on the dynamics of *V. cholerae* infection by describing a mathematical model that governs the colonization process for the bacterial dynamics.

Using the Effect Sizes of Subtasks to Compare Instructional Methods. Garry Johns, Saginaw Valley State University

The effect size is a statistical measure for comparing educational studies by estimating the effectiveness of various instructional methods or classroom environments. Introduced in the 1960s as a standardized difference between the averages of pre-and post-test scores or between the means of treatment and control groups, the effect size is easy to compute—even in meta-analyses of several studies with varying populations and sample sizes. It is considered reliable and is recommended—if not required—by some editors for studies to be included in professional journals. Unfortunately, even if a strong correlation exists between a teaching method and student achievement, the effect size does not explain why the correlation exists. For instance, if students teach some of the material in a college mathematics course (called reciprocal teaching), studies indicate that they achieve more; however, do student scores improve because they prepare a presentation, organize the material on their own, prefer listening to peers, or complete some other subtask?

In this paper, I describe a mathematical model called a network that shows the connections and correlations between instructional subtasks and uses a new statistic derived from known effect sizes to compare methods by assessing their subtasks.

Measurement of Sub-Cellular Forces in Neurons. Matthew O'Toole, Kettering University; Kyle E. Miller, Michigan State University

Forces are important for neuronal outgrowth during the initial wiring of the nervous system and following trauma, yet sub-cellular force generation over the microtubule rich region at the rear of the growth cone and along the axon has never been directly measured. Here we develop the first analytical mathematical model for viscous active fluids that describes the relationship between unequal sub-cellular forces arranged in series within the neuron and the net overall tension measured externally. Using force-calibrated towing needles to measure and apply forces, in combination with docked mitochondria to monitor sub-cellular strain, we then directly measure force generation over the rear of the growth cone and along the axon of chick sensory neurons. We find the rear of the growth cone generates 1.99 nN of contractile force, the axon generates 0.64 nN of contractile force and that the net overall tension generated by the neuron is 1.27 nN. Together this work suggests that the forward bulk flow of the cytoskeletal framework that occurs during axonal elongation and growth cone pauses occurs because strong contractile forces in the rear of the growth cone pull material forward.

Effects of Online Versus Traditional Instruction on Students' Mathematical Thinking. Mustafa Demir, University of Detroit Mercy

This study examined students' mathematics learning throughout the online and face-to-face settings. Thirty-five college students' answers to their final exam questions in the online and traditional Algebra courses were analyzed. Through using Webb's (2002) Depth of Knowledge (DOK) framework, the questions in the exams were assigned into three levels of mathematical thinking: "recall," "skill/concept" and "strategic thinking." A scoring guideline was developed to evaluate students' answers to the exam questions. The findings indicated that students receiving online instruction displayed higher performance in their solutions to the "recall" and "skill/concepts" types of problems than their peers in face-to-face settings. On the other hand, students taking traditional instruction obtained more achievement in their answers to the problems requiring "strategic thinking" than the students in online settings. The study also revealed that students in online settings often used visual representations (e.g., graphical, tabular) of mathematics concepts in their solutions to the exam questions. However, students in face-to-face settings mostly emphasized algebraic forms of mathematical ideas in their answers.

Medieval Studies

How the Holy Roman Empire Solved Its Identity Crisis, 1330–56. Thomas Renna (Emeritus), Saginaw Valley State University

The Holy Roman Empire had difficulty defining itself. Was it a German nation or a continuation of the Roman Empire? A series of crises after the passing of Frederick II in 1250 compelled the defenders of the Empire to devise theories

which were both idealistic and practical. The critical period was 1330–56 when imperialists and papalists moved towards a consensus on the basic issues of election by the princes at Frankfurt, the papal approval of this election, and the papal coronation of the Emperor of the Romans in Rome. I argue that the key to resolving the twin problems of “king or emperor” and of “pope or electors granting of the Emperor’s right to administer his temporals” was the agreement on the constitutional effect of the election at Frankfurt and the crowning at Aachen. This near-agreement found its expression in the Golden Bull of 1356, which had the result of clarifying the nature of the Empire for the next two centuries.

End of Life and End of Times: An Apocalyptic Funerary Altarpiece from Late Medieval Spain. Emily Kelley, Saginaw Valley State University

By the fifteenth century, Burgos, Spain was an established commercial center with mercantile connections throughout Europe. Many of the merchant families of Burgos founded funerary chapels in the city’s parish churches and monasteries, and today four merchant-commissioned altarpieces survive in situ from this period.

This paper focuses specifically on the altarpiece made for the chapel of the Buena Mañana in the Church of San Gil, which was founded by the merchants García Martínez de Mazuelo and Alonso de Lerma in the late fifteenth century. The paper offers original analysis of the altarpiece’s imagery based on comparison to contemporary works of art and using primary sources from the period, including the Mazuelo’s will. The paper argues that the eighteen saints’ effigies and two scenes from the life of Mary present on the retable are to be read together as a unified reference to the apocalypse. This type of unified and sophisticated iconographic program is unprecedented among the merchant altarpieces of Burgos and suggests both an unusual degree of ecclesiastical involvement in the design of the work and a later date for the altarpiece than has been previously assumed.

Christian and Pagan Fortune in Boethius’ *Consolation of Philosophy*.

Jonathan Klauke, Mid-Michigan Community College

This paper examines Boethius’ use of Fortune in books II–IV of his *Consolation of Philosophy*. Specifically, the paper examines how Boethius transitions from a traditional Greco-Roman Pagan interpretation of Fortune in book II towards a more Christian interpretation of Fortune found in book IV. The paper will examine how this transition occurs, its place within some of the other arguments presented in the work, and the larger implications of the later Christian interpretation of Fortune as societal commentary. Further, this analysis will add an additional element to the long term debate concerning whether the text is a Christian or classical pagan text.

Chaucer: The Wife of Bath’s Shadowy Fourth Husband. Basil A. Clark,
Saginaw Valley State University

Sandwiched between the block description of her three old husbands and of Jankyn, her fifth, is the Wife of Bath's anonymous fourth mate. While she elaborates in detail upon her relationship with the first three and expands at length on the drama of her life with the last, she says relatively little about the fourth. My paper argues that structurally and psychologically Dame Alice's account of this slice of her marital history provides an essential link between her youth and her maturity and softens her personal image. Though undeniably comic in her pursuit of mastery in marriage, the Wife, as T. L. Burton points out, reveals an intimate conflict between desire to dominate and to be dominated in her response to number four's philandering and thereby becomes a more sympathetic character: she rises above the garrulous harpy by which she can be too easily caricatured and effects a transition to her marriage to husband number five.

The Church as Mother: The Language of Female Authority in the Legal Documents of the Canonesses of Ste. Waudru, 1070–1304. Benjamin Wright, University of Notre Dame

Caroline Walker Bynum's *Jesus as Mother* introduced medievalists to the possibility of gender as a way of understanding twelfth-century spirituality, and Thomas Bisson has drawn attention to the history of this same period as a time of great social upheaval, when contemporary documents expressed voices of protest and violence, bearing witness to what power and lordship meant in the feudal age. This paper combines these disparate approaches to history by examining the language of female authority in the legal documents of the collegiate chapter of Ste.-Waudru in Mons, Belgium. This ecclesiastical institution, founded by the seventh-century Frankish matron Waldetrude, was led by a series of unusually powerful women, the prioresses, who managed their church's finances, controlled the appointment of male clerics within the town's other churches, and most powerfully of all, had canonical authority to deny male priests the right to celebrate the sacraments or divine office within the town. In defending these customary rights, the legal record of Ste.-Waudru's present a phrasebook of power that invokes the maternal, matriarchal status of Saint Waldetrude over and against the claims of the town's (male) temporal lords, who offered in turn their own lexicon, invoking ancient rights as commendatory abbots (literally, "fathers").

Microbiology

Reduction of Cellular Debris with Magnetically Charged Coffee Grounds for Identification of *Mycobacterium* spp. with Acridine Orange Stain.

Tiffany Turner, Allison Ward, Trevor Zimmerman, and Daniel González, Andrews University

Background fluorescence from DNA and cellular debris in clinical specimens can hinder identification of mycobacteria. This semi-quantitative, single blind study planned to magnetically charge coffee grounds and test how treatment of a white blood cell (WBC) lysate with magnetically charged coffee grounds (MCCGs) would affect the quality of the specimen stained with acridine orange (AO). Lysate without *Mycobacteria gordonae* with and without MCCG treatment and lysate with *M. gordonae* with and without MCCG treatment made up the four test systems. Slides were graded semi-quantitatively for WBC debris and mycobacteria. Coffee grounds were successfully magnetically charged. Qualitatively there was a reduction of WBC debris with MCCG treatment. There was a significant reduction of WBC debris in MCCG treated WBC lysates containing mycobacteria. This study has implications for developing a simple, cost-effective method for improving the identification of mycobacteria in patient samples that can be performed in resource limited areas.

Characterization of Microbial Communities in the Pitcher Fluid of Two Species of Carnivorous Plant. Sarah Fewkes, David Stroshein, Jeffery Morrisette, and Julie Zwiesler-Vollick, Lawrence Technological University

Carnivorous pitcher plants (CPPs) use pitfall traps that are made from modified leaves and form cone-shaped fluid-filled traps that animals slip into and cannot escape. The animals quickly die from lack of O₂ and are digested with enzymes either produced by the plant itself or by mutualistic organisms. To reduce potential competition for nutrients, or possibly for pathogen resistance, CPPs would benefit from an ability to influence the microbial colonization of their traps. Our study focuses on the complex ecological interaction occurring within the microbiome of pitchers. Specifically we are comparing the microbial communities found within “new-world” pitchers of the species *Sarracenia purpurea* to “old-world” pitchers of the genus *Nepenthes*. We are also characterizing the microbial communities from CPPs grown in the laboratory with those growing wild in Michigan. After collecting CPP fluid, we isolated microbes multiple times to ensure that bacteria represented individual colonies. Genomic DNA was isolated from overnight cultures. After PCR amplification, the 16s ribosomal RNA gene was sequenced to determine the species of bacteria present in each pitcher fluid. The diversity of microbes found in pitcher fluid, and the inferred ability of the plants to influence this community, will be discussed.

Antimicrobial Activity of Thymoquinone. Alya A. Almatrafi and Karen Reiner, Andrews University

With the increase in resistance to traditional antibiotics displayed by microbial agents, efforts have been devoted to explorations of naturally derived antimicrobial compounds. One such compound is thymoquinone (TQ) derived from *Nigella sativa* (black seeds) which acts as an anti-inflammatory and antioxidant (Ahmad et al., 2013). *Nigella sativa* (NS) is an herb that is a member

of the Ranunculaceae family. NS has been used since the ancient era. Extracts from the seeds have been used to treat various bacterial infections caused by *Staphylococcus aureus* and *Helicobacter pylori* and various diseases such as neuromuscular, cardiovascular, gastroenteritis, and liver diseases. This study investigated the antibacterial activity of TQ. Stock solution was prepared using DMSO mixed with different concentration of TQ. A disk diffusion technique was used to identify antimicrobial activity on Methicillin Resistant *Staphylococcus aureus* (MRSA), *S. aureus*, *Pseudomonas aeruginosa*, *Campylobacter jejuni*, *Escherichia coli*, and *Klebsiella pneumoniae*. TQ susceptibility patterns were identified for *E. coli*, *K. pneumoniae*, and MRSA. Further research is needed to determine minimal inhibitory concentrations for TQ.

Philosophy

Barth's Ceaseless Attempts at Unphilosophizing Schleiermacher's Philosophized Soteriology. Jae-Eun Park, Calvin Theological Seminary

Friedrich Schleiermacher and Karl Barth's soteriology are comprehended most pertinently when they are compared in the context of philosophized vs. unphilosophized soteriology. For Schleiermacher's answer for the question "how can we be saved?" is quite philosophical, arguing that as redemption is "sense and taste for the Infinite," this redemption can be fulfilled by the coincidence of opposites (coincidentia oppositorum) between the Infinite and the finite through participating in Christ's perfect God-consciousness. In this Neoplatonic-panentheistic process, the romantic rhetoric, "feeling of absolute dependence," plays a crucial role in entering into relation to God. Schleiermacher's soteriology thus can be labeled as a philosophized soteriology, namely, a "Subjectivist-Christocentric-Neoplatonic-Romantic-Soteriology." On the other hand, Barth's answer for that question embraces the ceaseless effort to remove any philosophical tenets and based on this work, he tries to rebuild his whole soteriological structure. For Barth, redemption is not the fulfillment of the coincidentia oppositorum, but the Immanuel per se as the accomplishment of the covenant and reconciliation between God and human beings. Barth argues that redemption should not be grounded on any existential or subjective experience, but only objectively "in Christ by Christ." Barth's soteriology thus can be characterized as an unphilosophized soteriology, namely, an "Overemphasized-Christocentric-Objective-Soteriology."

Social Pressure and Coercion in a Patient's Choice of Physician Assisted Suicide or Death (PAS/D), a Response to David Velleman's Article "Against the Right to Die". Jenna Sexton, Kalamazoo College

Velleman deploys Kant's notions of autonomy and dignity to argue against the claim that PAS/D is a "protected option for the patient" (to use Velleman's

terminology). Velleman argues that the Kantian definition of autonomy in the realm of medicine does not license an institutional right to die and that any such license would have unwanted social consequences: namely, that offering PAS/D would inadvertently convey or insinuate to the patient that her life is not of value. Moreover, giving patients an option to die would, Velleman argues, be perceived by the patient as actual social pressure to choose this option. Because Velleman considers any such message regarding the worth of the patient's life and any such pressure to choose death as obscenely wrong, he rejects the proposal that physicians should offer this option. I argue that Velleman overdramatizes the possible reactions on the part of the patient and underestimates the doctor's skill in presenting options. Removing this option, as Velleman suggest, is inexcusably paternalistic. I demonstrate that patients should have the right to receive PAS/D and hence physicians are obligated to offer PAS/D as an option when asked by the patient.

The Barred Subject as Crash Victim: Lacanian Identity Formation and Cronenberg's *Crash*. Morgan Jennings, Kalamazoo College

In *The Lacanian Subject: Between Language and Jouissance*, Bruce Fink follows Jacques Lacan through his infamous "return to Freud." Lacan approaches identity formation as the result of the violent inscribing of language onto an infant, an inscription that creates, not a multidimensional ego, but instead a fundamentally barred subject. After examining Lacan's account of subject formation through imaginary and symbolic identification, I turn to David Cronenberg's 1996 film *Crash*. Spawning significant controversy, *Crash* was written off by many as a pornographic and indulgent linking of sexuality with violence. While many critics note the detached performances and cold cinematographic style of the film, they often fail to recognize that such detachment and absence of emotion serve to present Cronenberg's creative visual intertwining of sex and violence, which is by no means gratuitous or prurient. I argue that through fusing human sexuality with car accidents, *Crash* uncovers the dark nature of fantasy and exposes the encounter between self and other as a traumatic and violent collision. Viewed through a Lacanian lens, the film thus offers an illuminating portrayal of the painful site of subject formation and the futile nature of desire.

God, Politics, and Philosophy in Plato's "Theaetetus-Sophist-Statesman" trilogy. Mark Moes, Grand Valley State University

In the *Theaetetus* digression Socrates practices his midwifery by inviting Theodorus to examine the flaws of his (Theodorus') conceptions of God, politics, and philosophy. Socrates' own very different conceptions go unexpressed but are hinted at in the second part of the digression. But conceptions of God, politics, and philosophy which are arguably Socratic are explicitly avowed in mythical form by the Eleatic Stranger in another digression—the Myth of Cronos in the *Statesman*. This paper discusses the content of the two digressions and their interrelationships. It puts forth an explanation of why Plato composed these two digressions in the way

in which he did and positioned them in the late trilogy where he did. It maintains that Plato intends the Theaetetus-Sophist-Statesman trilogy to dramatize for readers a sort of “pre-trial of Socrates” before an audience of philosophers and potential philosophers a few days before he goes on trial before the Athenian Assembly.

Sacrament and Givenness: Sacramental Theology and the Phenomenology of Jean-Luc Marion. Cory Dixon, Catholic University of America

The subject/object split current in modern philosophy—particularly the objective stance—plagues today’s sacramental theology. Sacraments are viewed as generalized objects sacred in their own right regardless of the particular experiences of those participating in them. The phenomenology of Jean-Luc Marion, however, provides a means of escape from the subject/object dilemma sacramental theology faces. Through the related concepts of givenness and the saturated phenomenon, Marion provides the philosophical tools that allow sacraments to be experienced in their uniqueness (*haecceitas*) and excess. Sacramental theologian Kenan Osborne engages post-modern philosophers whose ideas bear similarity to those of Marion, but he does not escape the subject/object split (nor seems desirous of doing so), instead shifting sacramental theology from the objective stance to the subjective one. Marion’s philosophy provides a true means out of the subject/object split in sacramental theology, avoiding the objective stance that has long plagued the field without resorting to the subjective stance Osborne takes.

Rhythm, Form and Meaning. Christian Van Houten, Kalamazoo College

According to Martin Seel, the appearing of forms is always some constellation of the interplay of time and space. In aesthetic forms, we are particularly concerned with the organization of time, for, as he says, they “are not generally there to create spaces, at least not in a literal sense, but to give time in a very literal sense. The meaning of form is time”. Elsewhere, he states “it is a basic characteristic of all aesthetic relations that in them we take time for the moment though in entirely different rhythms”. This is the extent to which he speaks of rhythm explicitly however, at least in his translated works, and it strikes me that this would be a vital component in his theory of aesthetic experience. An account is needed of how form and thereby meaning come to be apparent at all—identity is only intelligible in difference. My thesis is, then, that rhythm is the movement through which we are able to meaningfully connect different moments in a variable fashion, whose multiplicity substantiates the appearing of forms. Rhythm gives form to time and space, and thereby meaning to form. In doing so, rhythm also gives form to experience.

Medical Workers and the Right to Exit. Riley Cook, Kalamazoo College

The right to leave any country, including one’s own, is widely recognized in international human rights instruments. First, I examine the ways in which the

right to leave is not interpreted as absolute. Secondly, I will consider whether exceptions to the right of free exit should be extended so far as to embrace restrictions on the emigration of medical personnel. The mass emigration of medical workers in the global south causes tremendous harm to populations and therein becomes a human rights issue. If it is considered reasonable for states to override an individual's right to exit based on vital democratic interests, then one might say that states ought to be able to restrict emigration based on equally serious public health concerns. Ultimately, however, the tendencies of states that limit exit to oppress their citizens should make one careful in justifying emigration restrictions. Lastly, I direct the discussion towards initiatives aimed at mitigating the devastating effects of brain drain in the medical field without restricting the right to exit.

“In Kant’s Wood: On freedom, competition and the flowering of our species”. William Eaton, Zeteo: The Journal of Interdisciplinary Writing

“In Kant’s Wood: On freedom, competition and the flowering of our species” explicates a famous line of Immanuel Kant’s: “From such crooked wood as man is made, nothing perfectly straight can be built.” Kant’s analogy is rooted in particular kind of forest: of conifers competing for light by growing as straight and tall as possible. But there are, of course, more mature, deciduous forests in which, for example, dogwoods may flourish thanks to the shade of taller trees. This observation opens the door on a consideration of the Kantian, and Rousseauian, idea that a well-ordered society could regulate the freedom, security and indeed innocence of each and every child and adult so as to promote the maximum freedom and security for all.

Why Our Students Can’t Think Critically...And Why They Probably Never Will. Elizabeth A. Oljar and David R. Koukal, University of Detroit Mercy

We argue that our students cannot think critically because they have never had a course devoted entirely to thinking, a course which should teach them the underlying grammar and principles of critical thought. This fact is in marked contrast to the assumption of modern universities that students must take basic courses in composition and mathematics at the college level, even though they have taken such courses before arriving at a university.

We then argue that this problem is compounded by the number of vague and imprecise conceptions of critical thinking that exist in the university setting, the very place whose existence depends on teaching such skills. The common claim that “we all teach critical thinking” belies the fact that critical thinking skills have a natural disciplinary home: in logic courses, and consequently, in philosophy departments. Using an analysis of the key features of critical thinking, we argue that there is a difference between assigning critical thinking and teaching it. We conclude that the state of critical thinking education in modern

universities illustrates Plato's claim that philosophers are useless to society, because society fails to make use of them.

Wooded and Viewed, a Deconstruction. Arik Mendelevitz, Kalamazoo College

In his play, *Wooded and Viewed*, Georges Feydeau presents us with a woman walking into a lawyer's office and propositioning him for sex so that she can get revenge on her husband for suspecting her of cheating. As the play unfolds, we can see in it a sustained deconstruction of our relation to the other, specifically in how we sexually objectify those around us. To best investigate this I propose a Derridean deconstruction of the play. Derrida's aim was to point out aporia in a text, showing how they themselves deconstructed the text. After bringing to light these contradictions, deconstruction is then able to take them and recontextualize them in order to demonstrate what other functions they may or may not serve. From the get go *Wooded and Viewed* invites and encourages this approach by setting up absurd contradictions within the characters' actions in order to expose aporia within the society the audience resides in. The play intentionally generates contradictions and multiple readings in order to show itself to be unstable. By viewing the play, one would participate in a contract of unfinalizability by walking away with your own interpretations of the play.

Experimental Philosophy: The Use of Behavioral Studies Over Self-Reports. Amanda Firmingham, Saginaw Valley State University

In the paper both the fields Psychology and Philosophy are explored to bring light to the newer subfield of Experimental Philosophy and to offer early advice on gaining more valid data resulting in stronger arguments. The advice given is to put less emphasis on self-reports based on skewed answers provided by subjects about how they think on the self. The article *Whatever Happened to Actual Behavior* is put forth to show where research in Psychology is having problems with that particular type of experimental design. It recognizes that there is an issue with self-reports being a trend following the cognitive revolution even though it is not offering as much to the table as before. The trend referred to is the continuous use of self-reports as well as ignoring behavior studies in Psychology. Then an experiment, *Selfless Giving*, conducted by Experimental Philosophers is examined in its parts and then critiqued to guide the researchers in a helpful direction. Finally, both articles are compared to each other and a final critique on how to improve the new field by using an element of behavior in the research to strengthen the data and the argument.

Changing Definitions of Human Rights. Benjamin Stitt, Aquinas College

In "Changing Definitions of Human Rights: Does Society Have an Obligation to Provide?", the problem of what society should do with the changing definition of human rights is analyzed. If rights are no longer just negative rights, such as

civil rights, and are second and third generation rights, human and social (healthcare and housing for example), what effect does that have on the securing of and providing for of rights? An examination of the historical evolution of the philosophy of rights, this paper leads to current definitions of rights and argues that positive rights philosophy is justifiable. Furthermore, governments have, in recent history, been responsible for securing rights of citizens. Typically, these have been negative rights (civil rights). If we now include social and human rights, does the state still have an obligation to secure these rights, and if so to what extent? Civil rights generally only keep states and individuals from acting. Human and, especially, social rights require active participation and economic resources, which are a burden on states and citizens. The results are that positive rights are justifiable and the paper concludes that if positive rights are justifiable, states have an obligation to assist in securing them.

Personal Identity Versus Authenticity: Habermas and Heidegger on Individuation. Charles Davis, Kalamazoo College

Jurgen Habermas broadly understands personal identity as consisting in the communicative confirmation of one's self-interpretation. For Habermas, individuals form personal identities by interpreting their needs, desires, feelings, and actions in terms of how others in their social milieu do, or would, classify and categorize them. Relying upon Mead's symbolic interactionism, Habermas considers identity as the formation of a communicatively legitimated and hence socially stabilized public persona—a shared narrative, if you will. In stark contrast, Heidegger argues that one's deepest sense of self is precisely something that cannot be socially confirmed. Habermas's account of personal identity as tracking one's titles, roles and associations under a public persona is not individuating in the robust sense envisioned by Heidegger. For both Habermas and Heidegger, human beings assume an identity by identifying with social roles, normative obligations and cultural models, but Heidegger trenchantly rejects the idea that such public self-identification has anything to do with individuation. Instead, he demonstrates that what individuates Dasein is not any public content, but rather, it is how one holds their thrown fallen projections as a being towards death.

Dependent Interactive (or Integrative?) Dualism: Monism with Face Validity. Jay L. Brand, Andrews University

A number of alternatives to monism as a solution to the mind/body problem have been proposed, but none of them reflect the phenomenological certainty we all share that 'mind' must be more than mere 'brain.' In an effort to reconcile the increasingly compelling evidence from cognitive neuroscience for accepting some version of monism (the 'mind' is what the 'brain' does), a dependent version of dualism, termed dependent "interactive dualism" or dependent "integrative dualism" will be proposed that respects the subjectively compelling nature of

mind as the source of personal identity and nonphysical yet causative intention. This model accepts an interdependency between mind and brain such that 'mind' does not, indeed cannot, exist without brain; to a certain extent, a functioning brain may not exist without producing a 'mind' either.

A Philosophical Enquiry into Humanities Education at the Community College. Andrew Sandford, Aspen University and Southwestern Michigan College

What is the purpose of college education? What niche do community colleges fill in the post-secondary educational environment? If vocational training and education is the primary function of the community college, why require courses in the humanities? These are the questions which form the basis for this paper where I examine the rationale for requiring philosophy courses in the community college curriculum. My examination of this issue is done within the context of the Plato's Allegory of the Cave from Republic bk. 7. The various elements of the allegory are used as a trope for society's various needs. It is understood that needs may not be conscious needs and I think that society is not conscious of much of what they need. But from the world outside the cave to the shadows on the wall much of our sociological needs can be represented. This paper is informed by elements of Rawls' principles of social justice and the idea that any inequalities in education ought to be such that the inequality is structured in such a way as to benefit the least advantaged in a society. I think that at their core this ought to be one of the things which informs a community college's educational focus—particularly philosophy education.

On Capital Punishment. William J. Wickes, Saginaw Valley State University

In the discussion of the ethics of capital punishment, I find myself against its administration while my opponent Louis Pojman argues on its behalf. Pojman contends that capital punishment is justifiably within the administrative purview of the state on the ethical grounds of retributivist punishment; mainly that it is morally permissible for the state to execute some criminal offenders. However, Pojman's discussion seems to endorse something beyond what is necessary for retributivist punishment. Pojman argues for capital punishment on too extreme of revenge-based justifications. These justifications are ones which are not truly rooted in the desert of the criminal but are instead rooted in the vengeful desire of the punisher, and therefore not a defining characteristic of the retributivist ideology of just punishment. The following discussion will mainly illustrate why capital punishment is not necessary for ethical and retributivist punishment. I will also argue that alternatives to capital punishment, like life in prison without the possibility of parole, are equally as justice serving to deserving recipients as capital punishment is. However, alternative punishments will not inflict the same injustice upon criminals that the administration of state sponsored execution does.

The Phenomenological Relationship of Health and Gender. Drew Barna,
Kalamazoo College

We can use Merleau-Ponty to develop a radical notion of health, which can be mobilized in order to address transgender healthcare issues. We will define health as motility which is complementary to the flourishing of desire. This definition of health can guide us past contemporary understandings of health, which are based on what Foucault called regulative ideals. Foucault showed that regulative ideals are inherent to conventional understandings of health and that regulative ideals are mobilized in healthcare systems. However, Trans People find their very self-images unavoidably entangled in health care systems. While conventional politics assumes these self-images along the lines of dangerous regulative ideals, Foucauldian analysis is merely geared on calling these ideals into question. Neither understanding does the critical work of imagining, and arguing for, the redistribution of resources that would improve Trans healthcare. Our phenomenological understanding of gender moves us past a heavy-handed Foucauldian analysis, where all principles surrounding healthcare systems appear merely as dominations by bio power regimes. We can use our definition of health to practically imagine and argue for how healthcare systems can be systemically altered so that they are less reliant on, and derivatively, less likely to reinforce heteronormative regimes.

It's Not a Game. Anna Kietzerow, Southwestern Michigan College

In this paper I evaluate the idea of drone warfare in the modern world by evaluating and relating it to the popular Science Fiction novel *Ender's Game* by Orson Scott Card. In *Ender's Game*, Andrew "Ender" Wiggin is a top recruit in battle school. Throughout his training, Ender plays war simulations, piloting drones, to make it seem as real as possible. After his final simulation we find out that those simulations were real battles and Ender really destroyed an entire species. We are judged by other nations based on how we conduct our warfare. By evaluating a concept known as a "Jupiter Complex", the notion that we are righteous gods smiting our enemy, I suggest that drones take away from the idea of war and lead us closer to terrorism. The more we use force, especially imposing it with drones, who is to say that drone warfare won't become terrorism. We already use them to enforce an American political agenda over in the Middle East. Most people will say drones are to help protect us because of the conflicts overseas, but I ask did they build an army to attack us, or is it simply to protect themselves?

Political Science

Imagination vs. Perfection: Portraying the Next Generation from U.S. and German Art 1932–1944. Rachel Murdock, Saginaw Valley State University

Art has shaped and evolved into many forms of expressive material. It allows us to explore and experiment with new ideas as well as shape and mold us into a specific form of being. In the book *From Art to Politics*, Murray Edelman argues “[art] can create images and insights that enhance the political visions that are embraced” (37). Between the years 1932 and 1944 U.S. and German art portrayed specific themes and ideologies. Both had differing political agendas due to the severe economic depression preceding World War II. However, they both used art as a way to emphasize the importance of “the next generation” in continuing the state’s new way of life.

Federal Art Paintings by Charles Freeman and Jaine Ahring during 1937 relate to classic fairy tale stories, nursery rhymes and children’s literature. Nazi literature and illustrations from Ernst Hiemer and Elvira Bauer portray the deep-rooted political ideologies of Hitler’s Nazi Regime. Children during The New Deal were not pressured into forms of political decisions as the German children were; they were given the ability to express themselves through art and imagination. German children were sculpted and molded into perfect German people, bound by political ideologies.

“Stewards of the Land”: The Lummi Nation, the Courts, and Political Activism. Kelly Germonprez and Erik Trump, Saginaw Valley State University

Gateway Pacific has proposed a coal export terminal at Cherry Point, Washington less than ten miles from the Lummi Indian Reservation. The Lummi argue that this terminal will violate their treaty fishing and harvesting rights, infringe on their culture and ways of life, and endanger their economic conditions. However, this type of conflict is not new to the Lummi tribe. Beginning in the 1960s, Pacific Northwest tribes engaged in a vigorous legal and policy battle with the state of Washington in order to enforce their fishing, hunting, and shellfish gathering rights guaranteed in the original 1854 Stevens treaty. The tribes used door to door canvassing, fish ins, and other peaceful demonstrations to rally support, raise public awareness, and capture media attention. These methods of opposition can be seen in today’s controversy at Cherry Point and serve to remind us that American Indian tribes have evolved into stewards of the land who participate in environmental affairs beyond the reservation. The Lummi controversy at Cherry Point may well shape the outcome of the last contested right still being fought for by the American Indians today: the right to habitat protection.

Voter Turnout in State Legislative Elections: The Effects of Term Limits. Kevin G. Lorentz II and Anthony Jesuale, Wayne State University

Legislative term limits were instituted with the promise of reinvigorating an apathetic electorate. Gone would be the “career politicians” unresponsive to

their districts' concerns, term limits would usher in new candidates and legislators driven by a more direct connection to voters further engaged in the state's politics. Since the mid-1990s, a time in which a number of states adopted legislative term limits, their effects on the electorate remain largely unexplored. In that vein, this paper will evaluate claims made by proponents of term limits that such reforms increase voter participation. Through a comparative study of the electoral performance of state legislative candidates in Michigan and Illinois, we find that claims of a reinvigorated electorate are largely over blown, with voter turnout declining after the implementation of term limits. Our findings suggest that despite reformers' rhetoric otherwise, term limits are not the panacea they are billed to be.

Beyond Policy Diffusion: Does Venue Selection Also Diffuse? Marty P. Jordan, Michigan State University

Many scholars offer evidence of policy diffusion, whereby innovative jurisdictions adopt a new policy and other jurisdictions follow suit. However, this scholarship has primarily focused on one principal venue for policy diffusion—U.S. state legislatures. Consequently, there has been scant emphasis on diffusion in other venues—e.g., direct democracy initiatives and referenda, legislative referenda, state court decisions, and gubernatorial executive orders—available to political elites, interest groups, and citizens to pursue policy preferences. States have increasingly adopted policies by alternative means outside the orthodox channel of the legislature. Yet, we know very little about how, when, and why policies might diffuse across similar institutional venues. Importantly, this working paper examines if the venue selection in which policies are pursued also diffuse. To test the possibility of both policy and venue selection diffusion, I explore the diffusion of both partisan (e.g., anti- and pro-same-sex-marriage laws) and nonpartisan (e.g., eminent domain laws) policies across U.S. states.

The Future of State Legalized Marijuana: How It Should Be Done. Brian Rombalski Jr., Saginaw Valley State University

When looking at the future of drug prohibition in the United States, it is clear that recreational marijuana legalization is on the rise. Four states have already passed marijuana legalization policies, and one can reasonably assume more will follow. This paper compares the legalization policies of Colorado and Washington State with the purpose of finding guidelines that should direct the next states as they progress toward legalization. The two aforementioned states have been chosen because the policies are in the implementation stage, so we can evaluate how their respective regulations are affecting growers, sellers, and buyers. In addition, we can already see some of the unintended consequences that come along with these policies, including how they may be affecting the black market. This paper concludes that the next state to move along with this legalization

process should craft regulations that strike a middle ground between Colorado's and Washington's policy.

Liberalism for the 21st Century. Alex Tokarev, Northwood University

As an economist at Northwood University I teach the history and philosophy of various economic systems. In fact, humanity knows just two theoretical forms of organizing public interactions. All real socio-economic systems that have evolved through the millennia are a mix of the two opposite ideological concepts. Today we still have just two options to pick from.

One of the systems uses political coercion. The other is based on voluntary cooperation. One depends on a comprehensive central plan trying to promote a "greater good." The other relies on individual initiative utilizing "local knowledge" on a personal quest for happiness. One treats citizens as children who need fatherly discipline and motherly care. The other recognizes people as autonomous creatures endowed with inalienable rights and charged with personal responsibilities.

One is led by charismatic leaders and wise councilors. The other is impossible without free thinkers. One comes from the barrel of a gun. The other evolves organically from a multitude of social and market interactions. This paper explores the philosophical foundations of the American Republic and some of the economic consequences of straying away from the path of authentic liberalism.

Philippines-China Relations, 2001–2008: Dovetailing National Interests.

Charles Joseph G. De Guzman, Philippine Science High School- Main Campus, Diliman, Quezon City, Philippines

This study shows that the Joint Marine Seismic Undertaking (JMSU) between China and the Philippines is an attempt of both countries to advance their respective national interests. Arguing that the foreign policies of China and the Philippines dovetailed during the administration of President Gloria Macapagal-Arroyo, the study situates the JMSU as (1) part of China's overall foreign policy in Southeast Asia and (2) as an attempt to maintain good relations with the Philippines and help resolve tensions related to the South China Sea disputes between the Philippines and China. It also shows that (3) the JMSU, along with Chinese ODA, dovetailed with the Philippine government's plan to promote economic development and facilitate energy security. In conclusion, the study suggests a direct, causal link, not just conjunction, among Chinese ODA, the advancement of Beijing's security interests, and the signing of the JMSU.

Marijuana Republic. Evin Tucker, Saginaw Valley State University

Many recent polls suggest that an increasing number of Americans support legalization of marijuana for any purpose. Marijuana legalization is a measure that

has support from both major parties. With the increasing influence of libertarian politics in conservative circles, legalization is no longer seen as an extreme position among the public. As of the 2014 elections, four states and the District of Columbia have approved ballot measures to legalize recreational marijuana. Libertarians argue that legalizing marijuana will increase personal freedom by reducing government intrusion into Americans' lives. However, there is strong evidence that it will have the opposite effect. Marijuana is a highly potent substance that can cause addiction and impair physical and mental ability in ways similar to alcohol. Legalization would require government to expand its health services and spend more money on programs that are already in dire financial straits. Likewise, marijuana sale and use would have to be regulated in a method similar to alcohol or tobacco in order to ensure purity and prevent abuse. While current laws have clearly failed to prevent marijuana use, a full legalization is an extreme measure that would increase the existing bureaucracy and could have devastating consequences for society as a whole.

Psychology

Religiosity and Perceived Stress among Conservative Christian College Students. Cooper B. Hodges, Duane C. McBride, and Karl G. D. Bailey, Andrews University

This study examined how religious internalization plays a significant role in buffering against external stressors. We specifically focused on two forms of religiosity internalization: identified regulation (i.e., believing in a faith because one wishes to) and introjected regulation (i.e., following faith due to external pressure). Additionally, we investigated how this relationship may vary by ethnicity and gender. Participants ($N = 79$) were undergraduate students, in attendance at an American university affiliated with the Seventh-day Adventist Church, and completed self-reported measures of perceived stress (Cohen Perceived Stress Scale) and religiosity (Ironson/Woods Spirituality/Religiousness Index and the Religious Self-Regulation Questionnaire). Multiple linear regression analysis revealed that identified regulation was a significant predictor of stress perception levels compared to introjected regulation. Bivariate correlations indicated Whites were significantly more distressed by introjected religiosity, and that there were no significant variations between these variables by gender. We concluded that students who have a more internalized religious belief system are more likely to exhibit lower stress levels.

The Effects of Fitness and Stress on Memory in College Freshmen. Mikyung Kim, Rebecca R. Clouse, Landen A. Muasau, and Pamela S. Coburn-Litvak, Andrews University

The American Psychological Association recently reported that young adults between ages 18–33 have the highest stress levels in the nation. College freshmen face several unique stressors, such as adjusting to a new living and academic environment and facing mounting financial obligations. Chronic stress leads to structural changes in the prefrontal cortex and hippocampus that cause cognitive impairment. But interestingly, exercise is a physical stressor that facilitates function in these brain areas. The goals of the current study were to: (1) compare the effects of physical fitness vs. stress on memory performance in college freshmen ($n=22$), and (2) compare the effects of fitness vs. stress on the students' acute stress response. Preliminary data indicated that higher fitness levels may have been associated with improved hippocampus-dependent memory scores ($p = 0.08$, Cohen's $d=0.7$), but not prefrontal cortex memory. Higher fit students had an increased salivary cortisol response but decreased blood pressure response to a mild, cognitive stressor ($p < 0.05$). Students with higher self-reports of stress performed significantly worse on the prefrontal cortex-based task ($p < 0.05$) and showed a statistical trend for impairment on the hippocampus-based task ($p = 0.06$). Higher stress levels resulted in a significant decrease in salivary cortisol and increase in blood pressure to a mild, cognitive stressor ($p < 0.05$).

Specialized Disaster Behavioral Health Training: Its Connection with Response, Practice, Trauma Health, and Resilience. Christiana Atkins, Andrews University

This study examined the relationship between having training in key disaster behavioral health interventions and the number of crisis responses participated in within the last year, frequency of crisis team assemblies to practice interventions, trauma health and resilience. Data were collected from a convenience sample of disaster behavioral health responders ($N = 139$) attending a training conference in Michigan. Measures included the Professional Quality of Life Scale, the 14-item Resilience Scale, and a demographic questionnaire. Point biserial correlations revealed that having training in group and individual crisis interventions was significantly related with higher resilience and higher numbers of crisis responses participated in within the past year. Having no training in group and individual crisis interventions was significantly associated with higher burnout. It was found that having training in Psychological First Aid was not significantly associated with trauma health or resilience. These findings suggest that completing training in both group and individual crisis intervention techniques increases the likelihood of participating in multiple crisis responses and may help to build resilience and reduce burnout among disaster behavioral health providers.

Suicidality and Relationship with Self, Others, God, and Environment. In Hyuk Hwang, Hope College

The state of mental health in South Korea is very poor, where a flourishing mental health state is rare and a struggling one is the norm. Suicide statistics in Korea are the highest among Organisation for Economic Co-operation and Development (OECD) nations, with statistics of students' happiness ranking Korea at the bottom of the world alongside third-world countries. Studies show that the old and the young, specifically, high school students, are two of the most vulnerable population in this suicide epidemic. To contribute to the on-going conversation of research on the mental health of students in South Korea, this study will examine South Korean high school students' relationships with themselves, with others, with God, and with their current environment in conjunction with their suicidality.

To pave the way for an online survey in South Korea, for which a process of contacting high schools in South Korea has just begun, an IRB approved pilot study is currently in place.

The study will increase our awareness and understanding of Korean high school students' suicidality and relationships, and may have valuable and potentially life-saving implications in how we learn and adapt.

On Sociocultural Influences on Creativity. Shinming Shyu, Eastern Michigan University

The proposed study aims to examine the influences of sociocultural context on an individual's thinking processes and creative activities. Often, creativity is regarded as an inherent gift for individuals to create novel ideas and products of originality. As Shiffrin (1996) pointed out, the genetic factor enables individuals to gain extraordinary expertise to perform creative productivity. However, creative individuals also demonstrate a common tendency to absorbing information from surrounding environments and converting contextual influences into useful inspiration for his/her own creative endeavors. In his research on the interrelationship among society, culture, and person, Csikszentmihalyi (1988) noted: "we cannot study creativity by isolating individuals and their works from the social and historical milieu in which their actions are carried out. . .what we call creative is never the result of individual action alone" (p. 325).

Thus, recognizing that intrinsic and extrinsic factors interact to facilitate creativity, the study probes into the cognitive process of internalization which prompts individuals to absorb information from their surroundings. Arguing that the ubiquitous availability of modern digital technologies is exerting revolutionary impact on thinking process, the study concludes that an open, better informed sociocultural context is able to inspire, incubate, and enhance creativity.

Where Was It? Object Location Memory Depends on Sensory Modality.
Christopher Lilla, Rachel Anderson, and Franco Delogu, Lawrence Technological University

Remembering the location of objects is a crucial ability in human daily life. Contrasting results in visual and auditory working memory studies suggest that associating the location and the identity of stimuli depend on the sensory modality of the input. In this study, we tested the role of sensory modality in the incidental encoding of stimulus location during the voluntary memorization of the identity of a sequence of items. Eighty students from Lawrence Technological University were asked to memorize sequences of either environmental sounds, spoken words, pictures or written words. Participants were then presented with a sequence of stimuli including old and new items and asked to recognize the ones that had been previously presented. Crucially, they were also asked to indicate from which side of the screen (visual stimuli) or from which channel (sounds) the old stimuli were presented. The main results indicate that the accuracy in the unforeseen localization task was significantly lower for the auditory stimuli (environmental sounds and spoken words) than for images (pictures and written words). We conclude that incidental memorization of object location is more effective for visual objects than for auditory ones. Our findings are consistent with evidence of visual dominance for spatial processing.

Sugar Pops Out: A Perceptual Study on the Discriminability of Sugar from Artificial Sweeteners in Carbonated Soft Drinks. Macee Logerstedt, Souheila Hachem, Katelyn Steven, John Rizk, Derek Diamond, Luv Lodhia, Claire Huddas, Ryan Fernandez, and Franco Delogu, Lawrence Technological University

Consumption of sugar-sweetened beverages (SSBs), particularly carbonated soft drinks, is often considered as a main contributor to the epidemic of overweight and obesity in the USA. This study tested the discriminability of sugar and aspartame in 14 commercially available carbonate soft drinks. In a double blind test, 40 students of Lawrence Technological University were asked to rate the taste of 14 beverages in terms of sweetness, likeability and to recognize if the drinks contained sugar or aspartame. Ratings were made exclusively on the basis of the taste of the drink, as color and drink names were unknown to the subjects. The results show that: (a) accuracy in the discrimination task of SSBs from ASBs was poor; (b) accuracy varied drastically between subjects; and (c) despite participants' low accuracy of recognition, likability was significantly higher for SSBs than for ASBs.

Keep Me Posted! A Multidimensional Analysis of Facebook Status Updates. Raven Delph, Joshua Campbell, Rachel Anderson, and Franco Delogu, Lawrence Technological University

Facebook is by far the most used social network in the world. Active use of Facebook mainly consists in the so called "status updates", in which users can upload text, pictures, and videos. This study aimed at analyzing how the subject, the emotional connotation, the medium used, the originality and the self-

centeredness of status updates vary according to demographic factors like gender, occupation, and age of the poster. We analyzed more than 3,000 status updates posted by Facebook friends (the posters) of 19 students of the introductory psychology course (the scorers). Each scorer coded 250 status updates posted by his/her Facebook friends by labelling the posts according to several categories. To preserve and protect anonymity, the identity of the posters and the status updates were known only by the scorer and unknown to anybody else. Results show that Facebook status updates significantly vary in subject, emotional connotation, and structure as a function of demographic factors like gender, age, and occupation of the poster. Our findings are discussed in light of the main media psychology theories.

Examining Identity Styles and Religiosity among Chilean Undergraduate Students. Tevni Grajales, Andrews University; Vicente Leon, Universidad Adventista de Chile; Fatimah Al Nasser, Esther Hooley, Donalea McIntyre, Salenna Russello, Melina Sample, and Brittany Sommers, Andrews University

The purpose of this study was twofold: (a) to evaluate the construct validity of a Spanish translation of both the revised Identity Style Inventory (ISI-3) and the Brief Religiosity Scale (BRS-6), and (b) to develop a model of identity styles and identity commitment in predicting religiosity in the same sample of university students. Participants were university students ($N = 320$) from Chile. Confirmatory factor analysis confirmed the three-factor structure of the ISI-3 identity styles (i.e., informational, normative, and diffuse-avoidant), the separate identity commitment factor, and the factor structure of the BRS-6. Structural equation modeling was used to develop the model, which suggests that the three identity styles all have a direct effect on identity commitment, with commitments, in turn, having a direct effect on responses to the BRS-6. After conducting the analysis and making adjustments, the final structural model revealed that the normative and the diffuse-avoidant styles have direct effects on identity commitment, with commitments having a direct effect on responses to the BRS-6. In addition, information style was shown to have an indirect effect on the normative and diffuse-avoidant styles. Overall, the results of this study indicate that the Spanish translation of the ISI-3 and the BRS-6, when adjusted, could be useful in assessing identity styles and religiosity.

Lexical Access in the Temporal Cortex: tDCS Stimulation of the Top-Down Modulation Mechanism of Language Comprehension. Phillip McMurray and Gonzalo Munévar, Lawrence Technological University

Humans have a mental lexicon that easily stores more than 50,000 words for the average adult. By the processes of lexical access, selection, and integration, which work via a top-down modulation of semantic association, we make sense of our mental representations of words and produce verbal representations through speech. In this study, participants read aloud paragraphs from selected readings as

electrodes placed on their temporal cortex delivered small amounts of transcranial direct current stimulation (tDCS). Occasionally, trick words are placed within the text with the goal of being misread. For example, the word “defiantly” may be written but the semantic associations between other words tricks the reader into reading it as “definitely.” The goal of this study is to examine whether or not the settings of tDCS (anodal, cathodal, and sham) inhibit or improve the frequency of misreading trick words. The hypothesis of this study is that the mode of stimulation is inversely related to the frequency of misreading trick words because the stimulation affects top-down modulation. The anodal stimulation (positive) will decrease the frequency of misreading trick words while the cathodal stimulation (negative) will increase the frequency. The sham setting, not actually sending stimulation, will not affect the performance.

Intuitions About Free Will in Majority Religious and Non-Religious Samples. Charles M. Abreu and Karl G. D. Bailey, Andrews University

Folk intuitions about free will can have profound impacts on behavior. One of the few available instruments, the Free Will and Determinism – Plus (FAD+), measures beliefs about four causes of human action: Free Will, Scientific Determinism, Fatalistic Determinism, and Unpredictability. This survey was developed using Euro-American university and online samples (to avoid possible confounding ethnic variables). However, our lab has been unable to replicate this structure in ethnically diverse religious communities. Instead, we found three different factors: belief in consequences for free actions, chance events, and theistic constraints on behavior. A limit of these studies is that our samples were ethnically, but not religiously diverse. Thus, this study sought to demonstrate this scale’s validity in a less religious online sample. This survey was administered to the reddit online community (241 responses; 63% male; 75% non-religious). The FAD+ model failed to adequately fit (CFI = 0.695, RMSEA = 0.086). However, our three-factor model did fit the sample (CFI = 0.947, RMSEA = 0.062). The results from this study provide evidence for a reconsideration of the factors underlying folk intuitions about free will.

Relationships between Lived and Desired Multicultural Experiences and Diversity of Friend Networks. Tiffany Bailey and Melissa Ponce-Rodas, Andrews University

In our globalized society, multicultural experiences are becoming more common and necessary for productive interactions. The current study examined the relationship between multicultural experiences, the desire to have multicultural experiences, and diversity of friend networks. Previous research has shown that those exposed to multicultural experiences are less likely to engage in discriminatory decision making and intergroup bias (Tadmor et al., 2012). Participants for the current study were undergraduate students from a Midwestern Christian University’s subject pool. Each participant was asked to fill

out a questionnaire to measure the level of multicultural experiences they have been exposed to, their desire to have multicultural experiences, and a friend rate sheet to determine the diversity of each participant's friend network. We posited that the more multicultural experiences a participant had, or the more diverse experiences they desire, the more diverse their friend network would be. A significant positive correlation was found between multicultural experiences and diverse friend networks, and multicultural desire and diversity of friend networks. The implications of these findings will be discussed, and directions for future research given.

Eye Movements: Westerners Are Less Holistic in Decoding Facial Emotions. Yen Ju Lee and Harold H. Greene, University of Detroit Mercy; Chia-Wei Tsai and Yu-Ju Chou, National Dong Hwa University

Humans usually have to decode the facial expression on a person among surrounding faces. This is probably more complex in culturally diverse settings. Experiments suggest that when a face is surrounded by distractor faces, Japanese participants in Kyoto, look at the surrounding faces for longer periods than do Westerners in Michigan. The findings support the theory that East Asians are more holistic than Westerners in their allocation of visual attention. The holistic/analytical theory predicts that Taiwanese participants will pay greater attention than Westerners to surrounding faces, as they judge the facial expression on a central face. Thirteen East Asians in Taiwan, and 19 Westerners in U.S.A. decoded facial expressions on a central boy surrounded horizontally by facial emotion-bearing boys. Bivariate Contour Ellipse Areas of eye fixations showed that East Asians allocated eye fixations over a wider pixel area than Westerners ($p < 0.05$). We further attributed the wider area of interest for East Asians to a spreading of fixations horizontally, across the surrounding faces (i.e., wider standard deviation for horizontal eye coordinate points, $p < 0.05$). The results support the theory that East Asians are more holistic than Westerners. Implications for clinicians and clients in group contexts are discussed.

Relationship between Selected Socio-Demographics and Compassion Fatigue, Burnout, Resilience, and Compassion Satisfaction. Leandra Brown, Andrews University

This study examined how gender, age, and years of experience are related to compassion fatigue, burnout, resilience, and compassion satisfaction. Studies have indicated that individuals who have more experience in their profession seem to possess the ability to counteract the effects of burnout and compassion fatigue more so than those with less experience. Age has also been noted as a factor associated with compassion fatigue and burnout. Data were collected and analyzed on a convenience sample of 139 volunteer subjects who attended a 2013 Fostering Resilience in the Aftermath conference in Michigan. Subjects completed the Professional Quality of Life Scale, the 14-item Resilience Scale,

and a socio-demographic questionnaire. Results of a Spearman's rank-order correlation analysis showed a significant negative correlation between burnout and age and between burnout and years of experience for males only. The data suggested that males who are younger in age and have less experience in caring professions are more likely to experience the effects of burnout suggesting that older males have developed resilience techniques that reduce their chances of experiencing burnout.

Exposure to Narratives and Social Reasoning. Cassandra Chlevin and Karl G. D. Bailey, Andrews University

The primary purpose of this study is to replicate the work of Mar, Oatley, Hirsh, dela Paz, and Peterson (2006) on the relationships of narrative and non-narrative texts with empathy and social reasoning. They concluded that fiction—due to the parallels between narrative texts and the social world—may help readers maintain if not cultivate their social skills, whereas readers of non-narrative non-fiction may not have this benefit. The goal of this project is to attempt to replicate and extend this pattern in Seventh-day Adventist Christians using the original materials and a set of religious texts. Correlation analysis (Pearson's r and partial correlations) will be utilized to measure how subjects perform on the Author Recognition Test, the Interpersonal Reactivity Index, the "Reading the Mind in the Eyes" Test-revised, and on an instrument designed to measure subjects' familiarity with Bible characters. It is expected that the results of this replication study will mirror those of the original study and that the pattern will be extended to religious texts. In that case, an implication of this study would be that for an Adventist population, exposure to religious narratives may play a role in how empathy and social reasoning develops.

Fundamentalism, Personality, and Attitudes Towards Guns. Zachary Rho Takahashi, Jonathan Kenneth Smith, and Herbert W. Helm Jr., Andrews University

While previous research has explored attitudes toward guns, we found little on how it relates to the Big Five Index (BFI). Studies have found that males are more likely to believe that guns prevent crime—and that they have a right to carry them—while females are more likely to believe that gun ownership causes crime (Cooke, 2004). Additionally, previous research has found that those scoring low in psychoticism also have a negative attitude towards guns (Bernard and Lester, 1998). This study ($n = 192$) consisted of a survey comprised of the Attitudes Towards Guns scale (rights, crime, and protection; Branscombe et al., 1991), subscales of the Big Five Index (openness, conscientiousness, extraversion, agreeableness, and neuroticism; John and Srivastava, 1999), and the revised Religious Fundamentalism scale (Altemeyer and Hunsberger, 2009). Data were collected through a mass email to all students and faculty of Andrews University. Some of the findings included sex differences only on the issue of whether guns

will offer protection. Only black males were found to have a significant relationship between religious fundamentalism and the rights to own guns. Linear regression was also run on the Big Five and Attitudes Towards Guns.

Skills of Metacomprehension and Its Relationship to the Ability to Remember in Light of the Variables of Age and Sex among the Students of King Saud University. Abdullah Ahmed Al-Zahrani, King Saud University, Riyadh, KSA

This study aims at examining the relationship between metacomprehension skills and the ability to remember, the impact of the ability to remember with the variables of age and sex, and the contribution of metacomprehension in predicting the ability to remember. The results show that there is no statistically significant difference at the level of (0.05) between male and female students in metacomprehension . But there are clear differences in averages in favor of the females as in the studying dimension. The female average was (12.26); whereas the male average was (12.22). The results show too that there are statistically significant differences related to the gender in the ability to remember in favor of males at the level of (0.01), and there is a direct correlation at the level of (0.05) after the task metacomprehension and the ability to remember. As for the predictive relationship it was shown that all the metacomprehension variables were non- significant statistically but the task variable which has significant statistical impact at the level of (0.01).

Religious Studies

Construction and Aesthetics of Sacred Space: Prayer House, Hill Top and Mercy Ground among the Aladura in Nigeria. Timothy Baiyewu, Federal College of Education, Pankshin

This is a research report on the belief, construction, use and the redefinition of sacred space among the Aladura. In a somewhat neglected study of the transnationally growing Aladura religion, much attention has been given to its history, growth, response to social change, and exportation to the diaspora (Parrinder, 1953; Turner, 1967; Peel, 1968; Mitchell, 1970). Few major studies in the 1980s and 1990s have focussed on history, gender and impurity, and politics of cultural identity (Omoyajowo, 1982; Crumbley, 1989; Adogame, 1999), and most recently in 2014 is Timothy Baiyewu's major research on the resilience of Aladura Christianity in Nigeria. Much attention has been on the sacredness of spaces and the restrictions that are attached to their usage, at the neglect of the context and transformation that are associated with them. This study highlights the transformation that is taking its turn on sacred space. It is argued here that aside divine instruction, the social, economic and political challenges in the

larger society and the competitive religious marketplace have factored into the idea of sacred space in Aladura churches in Nigeria.

The Beyond Beliefs Study: What Do Millennial Young Adults Really Think of Their Church's Official Beliefs? Do They Even Know What These Beliefs Are? Jan A. Sigvartsen and Paul B. Petersen, Andrews University; Leanne M. Sigvartsen, ClergyEd.com

Much study has been given to retaining Millennial young adults (ages 18–32) within church organizations. However, it is still unclear if Millennial members have a comprehensive knowledge of the official beliefs of their church, and if they even like these beliefs. Given the responses Millennials may provide, and it is often difficult or impossible to modify doctrines, it becomes understandable why church organizations have avoided this type of research.

The Beyond Beliefs study sought to identify what Millennials attending Andrews University, the flagship university of the Seventh-day Adventist church, thought of the 28 Beliefs of Adventism, their knowledge of these Beliefs, and to test the efficacy of a General Education class that studied the 28 Beliefs. There were 679 participants in the study, a third of which were born internationally.

Findings suggest that despite being Adventist church members, few participants self-reported a comprehensive knowledge of the official 28 Beliefs. However, a General Education class that promotes critical thought in a non-didactic, non-polemic environment resulted in a dramatic increase in Beliefs knowledge among participants. It was identified that participants predominantly like the 28 Beliefs, however, what they do not like is how some Beliefs are officially presented or misused by some.

Religious Doubt as a Religious Virtue. Imran Aijaz, University of Michigan-Dearborn

My presentation consists of an exploration of religious doubt and whether it can be regarded as a religious virtue. In the first part of my presentation, I will consider a standard argument against doubt concerning religious matters and will argue that it does not succeed. In the second part of my presentation, I will present a positive case for regarding religious doubt as a religious virtue. This case is predicated primarily on the uncontroversial assumption that the search for truth is important and noble, from both a philosophical and theological perspective. I will conclude my presentation by considering some objections that may be raised against my case and will explain why I think they are not successful.

The Perfect, Royal Law of Liberty in the Epistle of James. Erhard H. Gallos, Andrews University

The term law (nomos) in James has two attributive adjectives, perfect and royal as well as being followed by a genitive case syntagma, law of liberty. The key texts where the adjectives as well as the genitive case qualifier occur are in James 1:25 (“But one who looks intently at the perfect law, the law of liberty, and abides by it, not having become a forgetful hearer but an effectual doer, this man shall be blessed in what he does.”), 2:8 (“If, however, you are fulfilling the royal law, according to the Scripture, ‘You shall love your neighbor as yourself,’ you are doing well.”), and 2:12 (“So speak and so act, as those who are to be judged by the law of liberty.”).

One might ask the questions: Are there three different laws James talks about? What is the function as well as the meaning of the adjectives perfect and royal? Does the term law need to be understood from the background of the Old Testament, Stoicism, Hellenistic Judaism, or early Christianity itself? Why is the law perfect, royal, and liberating? This paper will try to answer those questions.

The Rise and Development of African Independent Churches in East Africa.
Christopher R. Mwashinga, Andrews University

This paper looks at the rise and development of African Independent Churches (AIC) in East Africa (Tanzania, Kenya, and Uganda). The beginning of the twenty-first century has witnessed not only an increase of the number of AIC congregations but also of the Christians who are proud to identify themselves as members of these churches. The goal is to show the reasons for the emergence of the AICs and what has caused their proliferation in this region. This has been done by reviewing relevant literature on the AICs, and interviews conducted in the region. Upon examination of the historical, political, and cultural practices of various African Christian communities previously attached to the foreign mission churches, it becomes clear that most of the AICs came into being as a reaction to either the administration of the mission churches or colonial oppressive policies. In some cases it was the result of both. The prosperity of the AICs seems to have been influenced by a number of factors including convenience, nationalism, economic, and accommodation of some African cultural practices which are not allowed in mission churches.

Priestly Christology and Ecclesiology: Toward a Systematic Understanding of the Relationship between the Priesthood of Christ and the Priesthood of Believers. Adriani Milli Rodrigues, Andrews University

Overall, the priesthood of believers in Christian theology is related to the priesthood of Christ. The affirmation of this relationship may be found in classical theologians such as Thomas Aquinas, Martin Luther, and John Calvin; and also in contemporary theologians like Gerald O’Collins and Thomas Torrance. The purpose of this paper is twofold. First, I briefly describe and systematize the nature of the connection between these two types of priesthood in Christian theology. In

this section, I attempt to identify the main issues involved in this discussion and how they are conceptually articulated by Aquinas, Luther, Calvin, O'Collins, and Torrance. Second, I concisely describe how the connection between Christ's priesthood and the priesthood of believers is presented in the New Testament. The goal of this second section is to verify whether the New Testament provides a solid foundation for the relationship proposed in Christian theology and, if so, to identify what would be the basic principles of this relationship in the New Testament. In short, the present study represents a first step toward a systematic understanding of the connection between priestly Christology and Ecclesiology.

Significance of Mission in the Book of Revelation Against the Light of Imperialism. Kyung Jang, Calvin Theological Seminary

This article argues that the book of Revelation emphasizes *missio Dei* as an alternative to the Roman imperial ideology. Although missional reading of the Bible has attracted many scholars recently and a few scholars adopt it to the interpretation of Revelation, is seldom considered to be a book of mission, they seldom pay attention to the importance of imperialism, which is the very counterpart of *missio Dei* in the book of Revelation. *Missio Dei* defines mission as God's divine purpose to redeem the whole creation through the church, and this conception of mission is embedded in the whole Bible in terms of cosmology and eschatology, which reaches its pinnacle in the book of Revelation. Intriguingly, Roman imperialism was also grounded in its own cosmological and eschatological ideology, and thus destined to make an inevitable conflict with *missio Dei*. By juxtaposing this conceptual correspondence, this article argues that Revelation challenges its readers not to conform to the imperialism, but to adhere to *missio Dei* as their alternative Christian ethic. Moreover, based on the exegetical analysis of the related texts of Revelation, a brief application will be made for the Chinese church which suffers from the challenge of imperialism of her state.

The Dual Legacy of Jonathan Edwards's Conception of the "Union With Christ" Motif. Aldar Nommik, Andrews University

In his treatise *Justification by Faith Alone* (1738), Jonathan Edwards posits the concept of "union with Christ" as a central theological motif in his conceptualization of salvation. In so doing, he squarely situates himself within the Reformed tradition. What is absent from the treatise, however, is a clear delineation of the nature of such integral union of the believer with Christ. In fact, Jonathan Edwards admits in this treatise that he does not want to get drawn into any 'disputes' about the matter. Such confession is surprising, since as far as this research is convinced Jonathan Edwards freely discusses the nature of the union with Christ in his other entries without alluding to any 'disputes'. This paper, therefore, attempts to show that Jonathan Edwards's conception of the nature of "union with Christ" was a remarkable achievement in its own right, but incompatible with the Reformed understanding of justification by faith that he

set out to defend in *Justification by Faith Alone*. The discussion in this research is thus a participation in the wider scholarly debate over whether Edwards' soteriological viewpoints were closer to the Reformed or to the Roman Catholic theological tradition.

Newton and Prophecy: What He Says and Why It Matters. Mateja Plantak, Andrews University

Isaac Newton is best known for his contribution to physics and mathematics. However, he was as much of a theologian as a scientist. He explored Biblical prophecy in depth and wrote more extensively on it than he did on physics. A century after his death, Newton's prophetic writings had a great influence on William Miller and the Seventh-day Adventist church that arose out of the Millerite movement. Isaac Newton extensively researched the prophecies in the book of Daniel, such as 70 weeks in Daniel 9 and 2300 days in Daniel 8. This work explores Newton's prophetic interpretations of the book of Daniel, including his dating of the second coming of Christ to the year 2060 AD.

Social-Scientific Contribution to the Antioch Incident. Lincoln Nogueira, Andrews University

Social-scientific criticism has increasingly helped interpreters of the Bible fill background gaps left by historical reconstructions. Exploration of sociological and cultural elements of the first century society can assist in understanding interactions between the characters of the story within its complex society system. The text of Galatians 2:11–14 is an example of how different ethnic and religious groups co-existed and interacted. The common interpretation of this account—supported by, for example, James D. G. Dunn, Richard N. Longenecker, J. Louis Martyn, and F. F. Bruce—sustains the view that Paul lost the dispute because of his indecorous confrontation. Scholars agree that Paul's behavior was not appropriate, either because of the event itself or its repercussions. Hence, the question: was Paul wrong to rebuke Peter publicly? The purpose of this research paper is an effort to provide an alternative interpretation—using a social-science approach—to understand Paul's account of his rebuke of Peter's actions. Since the characters in Paul's personal story are motivated by different sociological factors, each action is explored. The main thesis of this paper is that sociocultural background elements, especially the honor and shame system, are essential to understand the characters' motives and actions in this story.

The Crucifixion of the Old Man with Jesus Christ in Romans 6:6. Guilherme Borda, Andrews University

The apostle Paul places significant emphasis upon the death of the Messiah in his letter to the saints in Rome. From a Greco-Roman perspective, his strategy

represents an emphasis upon one of the most shameful elements of the gospel. However, Paul is not ashamed of embracing the truth of the crucifixion of his Lord and even associating it with every follower of Jesus. This is uniquely seen in Romans 6:6, which contains the only occurrence of a word from the *σταυρώω* family and is the most explicit reference to the crucifixion of Christ in this letter.

The crucifixion of the old man with Jesus Christ represents a counterintuitive paradigm for overcoming. Not only does the expression of this aspect of the union between the believer and his Lord serve as a reminder of the unexpectedness of Jesus' messiahship, it stresses the magnitude of the impact the acceptance of Jesus as one's Lord brings. In contrast with a wicked past existence of willingly and even devotedly surrendering to sin in slavery, the one who has been united with Christ is ashamed of that existence.

This paper explores the crucifixion of the old man with Jesus Christ in Romans 6:6.

Correlates of Perceived Emotional/Verbal and Spiritual Abuse of Adult Children of Pastors. Duane McBride, David Sedlacek, and Rene Drumm, Andrews University

Social scientists have noted the level and consequences of the stress experienced by children of pastors. We conducted an on-line survey of pastors, spouses, and adult children of pastors in the North American Division of the Seventh-day Adventist Church in 2013/2014 (largely the U.S., Canada, and Bermuda). These analyses focus on the various types of abuse the 171 adult children of pastors who completed the survey perceived in their childhood. Overall, less than 5% reported any form of physical or sexual abuse. About 25% reported concern about emotional/verbal abuse they experienced with 17% expressing at least some concern about spiritual abuse. Analysis showed significant correlations between perceptions of being emotionally/verbally or spiritually abused and self-reports about substance abuse, mental health, gambling, behavioral expectations, domestic violence, and same sex attraction (.20 - .46). It is important for Church to be aware of the stress that pastor families are under, the maladaptive responses to that stress that may involve abusive family relationships 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 of pastor's children.

Islamophobia and the War on Terror. Achmat Salie, University of Detroit Mercy

Islamophobia—seeing Muslims as the hostile, suspicious, disgusting, and dangerous 'other'—is more pervasive and frequent than many ordinary Americans realize. This 'anatomy of intolerance' (Ernst) will discuss the three phases of Islamophobia, namely, imperialism, institutionalization, and industry (Lean) and

why islamophilia—seeing ‘good’ Muslims practicing ‘true Islam’ as allies—is not an alternative. Islamophobia is a multi-million dollar industry involving professionals, fake experts, anti Sharia hysteria, and using Islam bashing to gain political capital. The war on terror has in actuality become an aggressive war on Islam, especially tribal Islam (Akbar). Post the Cold War, the hot war against Islam, Arabs, and Muslims is part of American national identity. Islam is like a new foreign country (Grewal). Islamophobia—or fear of Muslims—has been genderized, racialized, and legalized; fear-mongering often expands state powers (Shryock). The paper will provide recommendations for future dealings with Muslims and Arabs. There are many lessons to be learnt from America’s founding fathers (Spelberg) as well as exemplary global citizens with a strong ethic of intentional inclusivity. The large educated Muslim American community is surprisingly optimistic, patient, and resilient in the face of all the suspicion and orchestrated scapegoating of their community.

Values of Seventh-Day Adventist Philosophy of Education and Graduate Social Science Programs in Seventh-Day Adventist Universities. Joel L. Raveloharimisy and Injae P. Son, Andrews University

This paper analyzes the relationship between the values found in religion and social science programs using the Seventh-day Adventist graduate programs as a case study. By using qualitative research, the study identifies the values of Seventh-day Adventist education philosophy, and analyzes the characteristics found from various graduate social science programs in the Seventh-day Adventist higher education system. We argue that the Seventh-day Adventist philosophy of education puts greater emphasis on relationship values, which have three interconnected dimensions (God, self, and others), and are unified by three virtues (love, hope, and service). Applying the dimensions of Seventh-day Adventist philosophy of education to the social science programs currently offered in the Seventh-day Adventist graduate institutions, we found that the values in Seventh-day Adventist beliefs are well-integrated in the social science programs in Adventist universities. The conclusion of this paper discusses the relationship between these values of Seventh-day Adventist philosophy of education and social science programs, and its implication to Adventist education and community development.

The Theological Motivation of Isaac Newton. Isabel Stafford, Andrews University

Isaac Newton, best known for his groundbreaking advances in physics, is remembered primarily as a scientist. The lack of explicit religious references in his scientific publications is often seen as a conscientious separation of science from religion. However, Newton was a theologian first and a scientist second, and his motivation for pursuing science came from his deep religious convictions. The *Principia Mathematica* was written primarily because of Newton’s theological

motivation, and not out of a desire to study science for the sake of science. Despite the apparent lack of religion in the *Principia Mathematica*, it is a deeply religious book that grew out of the theological motivation of its author.

Rhetoric & Composition

High Tech Collaboration: Teaching First-Year Composition in a Library “Smart Lab”. Julie A. White and Lindy Scripps-Hoekstra, Grand Valley State University

How does a professor engage students in composition and information literacy while offering a streamlined collaborative, hands-on experience? GVSU’s Mary Idema Pew Library features an innovative “Smart Lab,” outfitted with Media:scape pod tables, an interactive whiteboard, multiple projection screens, and moveable whiteboard easels. Instructional opportunities in this multimedia environment are expansive. Over the past two years, Lindy Scripps-Hoekstra, a liaison librarian, and I have worked together to develop engaging lessons for my first-year writing course. Focusing on the writing skills of concision and quality source integration, we created activities for students featuring significant collaboration using Media:scapes to search websites and databases, group competitions to develop concise sentences on the interactive whiteboard, and brainstorming activities on moveable whiteboards. This highly innovative environment results in analytical thinking and quality collaboration for students. Their responses to this learning environment and interactive writing activities have been overwhelmingly positive, illustrating the benefits of “Smart Lab” space when engaging digital natives. In our presentation, we will further detail the activities we developed and outline our approach to working together in this technology-rich classroom space.

Improving Writing by Improving Reading: The Case for What Works. Alice Horning, Oakland University

For a number of years, I have been arguing that in order to improve students’ writing, we need to work on their reading abilities. My argument hinges partly on the claim that for many students, formal academic prose is a foreign language and just as they cannot learn to speak French or Spanish without hearing it, they cannot learn to write the kind of formal language expected in higher education and the workplace without being exposed to it through experience with reading texts like those we are asking them to produce.

I have offered a number of strategies to work with students on reading, and have drawn from work being done in information literacy, psycholinguistics and reading pedagogy for these proposals. While some of them are simply common sense (make students read more and more challenging material; build vocabulary;

evaluate on specific issues, and so forth), others are based on my experience as a reader and a writer.

In this presentation, I will discuss more substantive evidence that improving reading can lead specifically to better student writing. The evidence will come from case studies, research in information literacy, and from the insights of working writers of both fiction and non-fiction.

Writing As Choice: Meta-Cognitive Thinking in Peer Review. Rori Leigh Hoatlin, Aquinas College

In composition courses, peer review is utilized as a way for students to receive feedback. However, peer review often has its limitations: students might not take it seriously; the feedback they receive is often vague or surface level; and even with directed instruction, students find it difficult to distinguish what's good advice and what's not. In order for peer review to work, students must first have access to the basic skills of writing. They must know how to identify their own practice of writing before they can begin to give one another insightful feedback. Because of this, meta-cognitive instruction inserted into the beginning of the composition course creates scaffolding for more insightful peer review later on. This presentation discusses one such meta-cognitive practice: the feedback assignment. This assignment, where students collaboratively grade a first-year research paper, provides an avenue for many of the basic writing skills they need for college (and beyond): identifying effective and ineffective writing, giving name to basic writing tactics, and devising revision strategies. This meta-cognitive awareness builds a foundation for students to then look at their own writing as well as their peers.

Solving the Writing Crisis: A New/Old Model to Help Students Prepare for Work, Grad School, and Life. Jane M. Siegel, Western Michigan University Cooley Law School (Emerita) and Valparaiso University School of Law

Our students cannot write. They are coming to college, grad school, and law school unprepared to write. The academy can't wait for lower ed to solve the problem; we must change our programs to fit the new normal and help our students succeed.

So consider this: let's reject the writing center and embrace the writing group. The undergraduate writing center that helps students to "fix" their papers is not teaching students to think for themselves. Instead, it encourages dependency—even laziness.

Students must learn how to write and edit their own work. And they must be inspired and motivated to strive for writing excellence—to embrace the writing process just as much as the end product. It is a lifelong endeavor for any discipline.

Writing groups give students an awareness of audience, regular feedback, self-confidence, and the opportunity to collaborate with peers. A writing group is a form of writing exercise, supported and encouraged by a group of fellow writers. And it mimics the real world, where teamwork and collaboration are the norm.

Writing groups are not new. But it's time now to try them in a new context.

Encouragement or Requirement: Ensuring that ESL Students Seek the Help They Need. Natalia Knoblock, Language Center International

The presentation addresses the issue of directive vs. non-directive approach to teaching ESL composition. The problem has received much attention, with the discussion revolving around the issues of appropriation of writing (Brannon and Knoblauch, 1982; Reid, 1994; Sommers, 1982), the proper Writing Center pedagogy with ESL students (Cogie, Strain, and Lorinskas, 1999; Petit, 1997; Powers, 1993; Moussu, 2013; Myers, 2008; Shamoon and Burns, 1995), and in research on teacher feedback (Ene and Upton, 2014; Keh, 1990; Schwertman, 1987; Walker and Elias, 1987). With an observable trend toward advocating more direct and even directive approaches, it is important to check the students' attitudes to such methods.

The project will recount the experiment conducted in a freshman composition class during the Winter 2013 semester at SVSU when the students were not only encouraged, but also required to attend the instructor's office hours and the Writing Center a certain number of times, and attend several study group meetings. At the end of the term, they were given a questionnaire that assessed their attitude toward the methods employed in the class, and their perception of the effect the hands-on methodology had on their learning. The results show a very favorable picture which encourages us to recommend more hands-on methods for ESL composition courses.

Reflections of an ESL Composition Student. Craig Hulst, Grand Valley State University

Jiemin is a former citizen of the People's Republic of China. In 2000, she emigrated to the United States and attended a university to complete a bachelor's degree in accounting.

Now, she reflects upon her experiences as a non-native speaker of English attending three college composition courses. Fourteen years after her first FYC course, she has an understanding of the material that she was taught, the manner in which she was taught, and the effectiveness of an American FYC course for a student who is not only learning writing, but also the culture of the US and the culture of US education. In this presentation, I will introduce Jiemin, discuss her experiences and her reflection on those experiences, and

comment on the effectiveness of teaching FYC to ESL students—especially commenting on using Service Learning in a composition course for this student population.

Librarians, Composition Instructors, and Students Researching Together: A Journey in Collaboration. Lauren Matacio, Andrews University

Teachers and librarians occupy different terrain on a university campus, yet they share several goals and concerns. Both “want students to develop a greater understanding of and respect for [...] intellectual property. Both want to enhance students (sic) literacy particularly information literacy, and help students become writers, problem solvers, critical thinkers, and self-directed, lifelong learners. Lastly, both want to build the social and learning community on campus” (Hollander et al., 2004). Ironically, while librarians recognize the importance of cooperation between themselves and their teaching colleagues, teachers seem less committed to close collaboration. This is unfortunate since “neither library nor composition instruction alone [yield] the strongest student writing, but [...] close collaboration between the two in both creating the assignment and delivering instruction is essential to supporting good student writing and research” (Barratt et al., 2009). This paper responds to Hrycaj and Rosso’s (2007) call for greater cooperation between librarians and faculty and engages in an anecdotal analysis of a librarian and a composition instructor’s team-taught, research writing course with particular attention to how cooperation influences the instructional design of the course.

Self-Confession in the Composition Course: Students’ Reflections on What They Have Learned About Writing. Bruce Closser, Andrews University

At the end of each semester the department of institutional effectiveness invites university students to evaluate their courses and course instructors. These evaluations are intended to provide the institution with some sense of how successful instructors have been in doing their work. Students’ responses may or may not influence teachers’ decisions about course restructuring, and they often figure in faculty advancement decisions, yet the evaluations themselves say little about what students have actually learned in a composition course. The grades teachers assign to student essays provide some indication of what skills students have mastered, but these assessment practices suggest very little about what students themselves believe they have learned from their composition courses. For several years I’ve collected reflection essays written at the conclusion of each assignment. In these reflections students comment on their writing processes in completing the assignment. This paper is a qualitative analysis of a series of artifacts produced by students in one general composition course with particular attention devoted to what their remarks suggest about what they’ve learned about writing in the course.

Sociology

The Impact of Heterogeneity in Online Social Networking on Offline Perceptions and Bridging Social Capital. Ryan Castillo, Lake Superior State University

Bridging social capital is the resource whereby individuals access information and social support through what are typically weak, heterogeneous connections with others. Social networking sites are a source of bridging social capital due to the broad, diverse community that these sites maintain. Previous studies have examined the effects of online social networking on both online and offline bridging social capital, but have failed to account for differences in user behavior. This study distinguished user type as either passive or active and examined the effects of heterogeneity on both online and offline bridging social capital for each primary user type. Furthermore, this study examined the use of superficial information in online self-presentation and its effect on perceived similarity between users. This research will help to guide conventional groups, such as workplaces and educational institutions, in the maintenance of group-cohesion by offering a better understanding of how heterogeneity affects casual connections and in what ways self-disclosure affects perceptions of similarity between individuals within a large community.

Drinking Motivations and Associated Behaviors among Americans and Canadians. Kara Heggaton, Lake Superior State University

Adolescent alcohol use has been found to be positively correlated with deviance in early adulthood. The current research examines deviant behavior of respondents in both Canada and the U.S. to assess the differing effects of the drinking age in both countries. This study looks at the relationship between an individual's first time drinking alcohol, the legal drinking age, how this might influence deviant behavior, and also examines disparities in the drinking rationale between Canadians and Americans. To assess this, surveys were distributed via email to one university in Northern Michigan as well as one university in Ontario, Canada. Respondents were asked questions regarding their age of first alcohol use, current drinking patterns, reasons for alcohol use, mental health, and lifetime participation in deviant behaviors. The presentation will conclude with a discussion of the differing effects of legitimized drinking on associational behaviors.

Coping with Loss. Erin Benson, Lake Superior State University

Individual grief experiences vary according to social and cultural factors. Proper social support creates an adequate environment for individuals to resolve their grief. Without social support an individual's grief experience is disenfranchised. The purpose of this study is to determine whether or not there

are grief situations that are more or less likely to be socially accepted among experiences of disenfranchised grief. Previous research suggests that when grieving individual's feels unsupported, emotional problems are subsequently magnified. This study examined negative results from losses such as depression and low self-esteem. The collection of data was from two types of communities in Northern Michigan; adult students living on campus and adult individuals who attend local churches were used to measure aspects of restrained coping, disenfranchised grief, social support, religiosity and positive coping. This survey will help measure social outcomes of grief coping related to social support as well as the type of loss. This study seeks to provide a better understanding of the need for increased recognition by future social service professionals to develop programs designed to assure social support, thereby reducing the risk of negative outcomes for grieving individuals.

Social Cohesion, Gambling Perceptions, and Casino Proximity. Andrea Killips and Richard Kirk Mauldin, Lake Superior State University

Previous studies have found that cohesive surroundings can positively influence an individual's upbringing and behavioral outcomes. Cohesion among groups has also been found to buffer against negative stressors such as alcohol abuse and poverty. However, there has been little research examining the relationship between social cohesion and participation in gambling. To better understand this relationship, the current study looked at an individual's positive or negative perception of gambling, their gambling activity, and the perceived cohesion among families and within neighborhoods. Variables such as income, age, gender, and race were also considered. The study will conclude with a discussion of how race, social cohesion, and proximity to gambling facilities interact to encourage or discourage various gambling behaviors in order to better mitigate the effects of pathological gambling.

Corporal Punishment and the Effects of Aggressiveness within Relationships. Sydney Kerckaert, Lake Superior State University

Parental corporal punishment refers to the intentional application of pain in order to change a child's behavior. While past research suggests that corporal punishment is positively associated with increased levels of aggression among children, little has been done to assess the affects of such punishment later in life. This study examines the possible lingering affects of corporal punishment on the aggression levels on grown offspring within both casual and romantic relationships and further explores the impact of conservative religious ideologies and gender on both the frequency and likelihood of corporal punishment. The research concludes with a discussion of the negative outcomes of parental corporal punishment and offers suggestions for improved parent/child interaction.

Self-Efficacy and Its Implications for Development. Kern D. Agard , Robert A. Bailey, Tunisia Peters, and Laurie Pierre, Andrews University

What is the role of self-efficacy on the completion of life skill programs and does the learned helplessness theory exacerbate some of the problems faced in the successful outcomes of these development oriented programs? This research examines the effects of self-efficacy, and its inverse learned helplessness, and their role in the development field by looking at an individual's initiative to complete life skill programs. Through his research, Albert Bandura has shown that self-efficacy is that belief in one's own ability to complete foreseeable tasks and reach their goals. This was assessed using the New Self-Efficacy Scale, and conducted within inner city homeless shelters in Benton Harbor, Michigan and South Bend, Indiana. This study has failed to show any significance between a person's self-efficacy and their completion of these life skill programs. Further research and a new method for examining the completion of programs is needed to examine the importance of self-efficacy in the completion of life skill programs.

Environmental Ethics and Sustainable Design: A Case Study on the Traditional Asian Building Design. Na Han and Shinming Shyu, Eastern Michigan University

Originated in the realm of philosophy, environmental ethics takes into consideration the moral relationship between human and non-human world. In light of the severe impacts by human activities on this planet, environmental sustainability has become an extremely urgent issue that prompts the public to perform in accordance with sustainable principles to create comfortable, eco-friendly space. Moreover, there is an increasing realization that to preserve the environment for the future generations to come is our undeniable obligation. This research studies the social components in environmental sustainability with a focus on the ethic value and strategies introduced in the traditional Korean building type known as Han-oak. It explores how renewable principles and materials were carefully used in a way that harmonizes the man-made with the natural environments. The paper argues that it is imperative to view social environmental ethics as a driving force for environmental protection and the traditional Korean building type by the sensitive artisans may provide some valuable lessons.

Demographic, Psycho-Social, and Religious Predictors of Suicide Attempts among Adolescents of a Conservative Religious Denomination. Isaac Suh, Harvey Burnett, Lionel Matthews, and Jerome Thayer, Andrews University

Recent research indicates that suicide is a growing cause of death in our country (CDC, 2010). Over the twelve year period (1999 to 2012), suicide rates increased by a staggering 40%. This is especially evident among adolescents (13–17 years). In spite of this trend, much remains to be known about the variability

of this phenomenon across various subcultures. This study examines suicidal ideation and the effect of various demographic, psycho-social, and religious predictors among adolescents of a conservative religious denomination. Data are utilized from the second wave of the Valuegenesis Project carried out in 2000, using a survey design. The survey was administered in Adventist high schools across the United States (N = 12,633). Preliminary results indicate a significant inverse relationship between suicidal ideation and intrinsic religious orientation, family climate, and caring parenting, and a direct relationship between overprotective parenting and extrinsic religious orientation. A direct significant relationship was also observed between depression and suicidal ideation. These findings are consistent with the literature. An important implication from these findings would suggest the implementation of family-focused suicide awareness strategies within the Adventist educational system.

Measuring the “Social Carrying Capacity” for Wolves in Michigan. Roger Nemeth, Ethan Gibbons, and Molly Greenfield, Hope College

This research project is a study in applied sociology. The overall goal was to survey a representative sample of Michigan residents to measure the “social carrying capacity” for wolves in the state. Findings from the project are intended to contribute to the public discourse on the future of wolf recovery and wolf management efforts in Michigan. Specific objectives of the proposed project were:

- (1) to survey Michigan residents on their support of wolves and their opinions on how best to manage Michigan’s wolf population in the future;
- (2) to survey Michigan voters about two ballot proposals pertaining to wolf hunting and who should have the authority to designate animals as game species; and
- (3) present initial findings in a press release prior to the November 2014 vote to gauge how well our survey findings predict actual vote tallies.

The research method employed was a telephone interview using a stratified random sampling design. This method and sample design ensured that results would be representative of Michigan residents living in the Upper and Lower Peninsulas. The survey of 444 adults included a sample of both landline and wireless phone numbers of Michigan residents.

Exploring the Syntactic and Semantic Aspects of Persian Geometric Patterns. Negar Heidari Matin and Shinming Shyu, Eastern Michigan University

Geometric patterns have been used throughout the course of history as a vehicle to convey the essential framework of a sociocultural system. Therefore, the complexity of Persian geometric patterns has been drawing attention of many

scholars. Although comprehensive efforts have been able to reveal some underlying structures of these geometric patterns, the richness of these patterns deserves more academic attention.

In the wake of regional economic development, modern applications of Islamic patterns to building design are gaining popularity in Islamic countries to manifest their religious beliefs. Further, the traditional two-dimensional Islamic patterns have been transformed into three-dimensional devices to function as solar shading systems controlled by an automation computer network. Nonetheless, the sociocultural meanings of Islamic patterns seem to have been neglected. For instance, the religious prohibition of using anthropomorphic expressions in arts and architecture prompts Persian Muslim artisans to focus on pure abstract geometric forms.

Recognizing patterns as the embodiment of sociocultural institution, this paper investigates both syntactic and semantic aspects of Persian geometric patterns including both Islamic and Pre-Islamic eras. It analyzes the geometric structures and principles of pattern design. Moreover, it decodes the deep meaning underlying the patterns by referring to ancient Persian literature and religious texts.

Health and Social Impacts of Food Deserts on Metropolitan Detroit Communities. Michelle Proctor, Madonna University

This project explores the health effects on people who reside in urban communities lacking healthy food choices in the Metropolitan Detroit area identified as food deserts. Food insecurity can be correlated to negative health and well-being such as obesity and slower developing cognitive function. The Metropolitan Detroit area has begun to address food deserts through efforts focused on creating education regarding food choices, and initiatives to support local farmers who bring food to local markets in food desert communities so that fresh fruits and vegetables are not scarce, overpriced, or simply unavailable. Using a qualitative ethnographic field approach, participant observation at area urban farm initiatives, food pantries, distribution centers, and urban farm markets in the Metropolitan Detroit area is employed along with interviews conducted with key informants (service providers to individuals experiencing food injustice) to gain a better understanding of the barriers (e.g., transportation, economic, and food availability) that exist in urban communities, particularly those in low-income communities of color, with regard to access to healthy and nutritious foods. Results aim to better understand the health and social impacts on those who do not have access to healthy food and/or may be suffering from food insecurity.

Spiritual Challenges of Pastoral Families: Qualitative Results. David Sedlacek and Alina Baltazar, Andrews University; René Drumm, Consultant; Elaine Oliver, General Conference of Seventh-day Adventists

Researchers conducted six focus groups to understand the lived experiences of pastors, spouses, and adult children among Seventh-day Adventist clergy families in the U.S. The number of focus group participants ranged from four to ten. The focus groups were audio recorded and transcribed verbatim. Interview guides were developed that offered open-ended questions derived from lingering questions from the quantitative data analysis.

The qualitative analysis followed a grounded theory approach using the constant comparative method. Thus, the coded themes emerged within the naturalistic paradigm. To ensure consistency and trustworthiness of the analysis, researchers used the analytical tools of member checking and peer debriefing.

Qualitative data analysis revealed a number of barriers that pastoral families experienced in maintaining a strong spiritual life. Those barriers included: parishioners with unrealistic expectations, stress related to time constraints, their spouse's work load and schedule; the impact of their spouse's job on family worship; and feeling isolated or lonely.

Factors that facilitated a sense of having a strong spiritual life included: having adequate social support; prioritizing having a time and place to develop an active relationship with God; and observing God at work in their own lives and in the lives of the people they serve.

Oppressing the Majority: Animals and Social Work. Ken Ford, Grand Valley State University

A major aspect of the social work field is to combat systemic oppression as well as advocate for marginalized groups that oppressive policies target. As the social work field continues to grow in scope, so does the inclusion of what constitutes a marginalized "group". What about animals? In recent years, master of social work practitioners are beginning to include animals as an oppressed group, as these practitioners believe the marginalization of this group functions analogously to other oppressed groups in society. This presentation will focus on the intersection between social work and animal justice. Information from literature on the topic will be included as well as insight from interviews with MSW social workers that have worked with the animal justice field for more than five years.

Michigan Hydraulic Fracturing Controversy: Evaluating the Communication between Stakeholder Organizations and Their Constituencies. Amanda Martin, Madonna University

In the State of Michigan, there is growing controversy over the mining process for natural gas and oil located in shale deposits known as hydraulic fracturing (HF) with the debate centering over its need and safety. Similar discussions over the use and safety of HF are taking place nationally. Different stakeholders view the risks and benefits of HF differently and often there is a rift in defining risks

and even defining hydraulic fracturing. This research examines the variables considered by stakeholder organizations within the State of Michigan and the concerned citizens affected by HF. The research explores the following: the stakeholder's position on HF in Michigan; the stakeholder's constituencies and how they interact with one another to convey their message; and how effective do the stakeholders believe their message is in reaching their target constituencies? The differences between the views of stakeholder organizations and their constituencies will be described as well as how the various constituency groups grade the effectiveness of different marketing strategies and how these variations are viewed across the various stakeholder organizations.

Spanish Language, Literature & Culture

Navidad & Matanza, a novel by the Chilean Carlos Labbé. Rafael H. Mojica, University of Michigan-Flint

Carlos Labbé is a Chilean writer who grew up as a child during the last years of the Pinochet regime. Already as a young writer his fiction bears the marks of the effects produced by the dictator's regime on men and women of his generation; it also casts a dark gaze on the neo-liberal policies of the democratic regime that succeeds the dictatorship in 1988. Labbé's early critical impact takes place with *Libro de plumas* (2004), a novel that was followed by *Navidad y Matanza* in 2007, and *Locuela*, in 2009. Three novels published in a period of five years in a decade when critical acclaim is captured by Roberto Bolaño, another Chilean who, born in 1953, was 24 years Labbé's senior. In 2010 GRANTA, the prestigious British quarterly, includes Labbé as one of the most promising young novelists writing in Spanish. It is my purpose in this presentation to briefly analyze the narrative formula that, in *Navidad y Matanza*, makes Labbé deserving of this distinction. This novel has already a translation into German (2010), followed by an English translation as *Navidad & Matanza* in 2014. Labbé's most recent novel is *Piezas secretas contra el mundo*, published this year.

Musical References and Topographical Counterpoints in the Poetry of Julio Cortázar. Joseph Tyler, University of Michigan-Flint

I am planning to discuss referential data revealed on a particular poetic manuscript "La noche de las amigas" (The Night of my women friends) by the Argentine novelist Julio Cortázar. Elsewhere, I have dealt with the theme of Jazz in Julio Cortázar's literature, and I have also visited the many topographical areas in Paris and the south of France—mainly Saignon in Provence, where this writer had a summer house, lived, and entertained. Although, Cortázar's reknown stems from his prose—his work as a superb short story writer and an avant-garde

novelist (his highly experimental and seminal novel known as *Rayuela* (Hopscotch) is an excellent example)—his sojourns into the poetic landscape are far less known. Cortázar's poetry is, probably, the least understood and appreciated aspect of his oeuvre. For that reason, I intend to act as a land surveyor to identify places and to activate timely references. Furthermore, I would also like to explore the personal relationships the author mentions and makes part of his composition. All of this suggests the vitality and importance of amorous, and morose, longings and acquaintances.

La Violencia Doméstica, el Sufrimiento y Autodefensa de la Mujer en “Cambio de armas” y Arráncame la vida. Maribel Colorado-García, Saginaw Valley State University

Luisa Valenzuela en su cuento “Cambio de armas” (1992) y Ángeles Mastretta en su novela *Arráncame la vida* (2004) exponen un cuadro donde la violencia doméstica es intimidación y agresión abusiva de un miembro de la familia sobre otro. El tema de las mujeres maltratadas domésticamente entra en el debate público debido al movimiento feminista. Esto se hace más evidente a partir de la década de los setenta, como lo señala Sandra Brown (114, 115). En “Cambio de armas” (1992) y en *Arráncame la vida* (2004) las dos protagonistas, Laura y Catalina, sufren de este ambiente opresivo, del que no pueden escapar y así ambas crean una estrategia de sobrevivencia. Ellas deciden protegerse del abuso y sublimar el sufrimiento que las minimiza y las destroza física y emocionalmente. Ambas mujeres encuentran distintos artificios mentales y emocionales abstrayéndose mentalmente y concentrándose en el placer carnal, refugiándose en la figura de un objeto o persona que encarne de algún modo la falta de libertad y expresiones afectivas, usando también sus cuerpos como herramienta de resistencia ante la agresión de sus parejas, así como empleando la comida como instrumento de escape de la ansiedad y angustia del entorno represivo que las asfixia.

“Francisco José Gabilondo Soler y la ‘Revolución Cultural’ Mexicana”. Brian J. Gunderson, Concordia University Wisconsin

Al terminar la Revolución mexicana, el enfoque del gobierno era crear un nuevo mito con el cual todos los mexicanos se pudieran identificar o en el que pudieran encontrar causa común. Ese tipo de creación de la “nación” tiende a incluir un símbolo o un personaje histórico que puede ser usado como el modelo de la “mexicanidad”. Aunque sí fue sumamente importante la obra del ensayista José Vasconcelos, y su trabajo al convencer a la gente de que pertenecían a la “comunidad imaginada”, Francisco José Gabilondo Soler fue autor de cuentos y cantor que influyó en la creación de tal comunidad en México. Elvira Desachy-Godoy afirma que Gabilondo “Soler presentó alternativas” al considerar quién(es) ayudaron a formar “la mexicanidad” que conocemos del siglo XX y XXI (3). Es sumamente importante en el estudio del siglo XX del afrodescen-

diente mexicano ver algunas de las fuentes populares que consumieron la mayoría de los mexicanos, especialmente en la época post-revolucionaria en que se buscaba re-imaginar a la “nación” mexicana. Este trabajo pretende explorar esa fuente cultural que influyó en la creación de la “comunidad imaginada”, y busca hallar lo subversivo en las canciones del Cri-Crí en el identitario mexicano actual.

Women’s & Gender Studies

A Case Study of Gender Advocacy in Faith-Based Organizations. Erenly Agosto and Joel Raveloharimisy, Andrews University

This paper analyzes how gender advocacy is approached by faith-based organizations (FBOs). We use the following FBOs as a case study: Tearfund, World Vision International, Muslim Aid and Islamic Relief Worldwide. Using Kappaz’s (2001) comparative approach to advocacy we look at different activities of each organization in relation to gender advocacy. The comparative approach includes the following activities: (1) consultative status at the UN, (2) research and policy papers, (3) education and public awareness campaigns, (4) lobbying for global policy legislation, (5) lobbying on domestic policies in developing and developed countries, and (6) advocacy department or staff. We conclude that the differences in approaching gender advocacy of the organizations listed above are based on the values they uphold based on their religious affiliation.

The “Unnatural Fashionable Figure”: Dieting and the Middle-Aged Woman in Ursula Parrott’s “The Boy Next Door”. Julia K. Nims, Eastern Michigan University

The emergence of the Flapper in the 1920s spurred a dieting craze that had millions of women counting calories and performing calisthenics. Advertisements, articles, and illustrations in popular women’s magazines such as *Ladies Home Journal* and *Woman’s Home Companion* encouraged women to lose weight if they wanted to be admired by husbands and beaux, and envied by their female friends. By the early 1930s, the number of advertisements and articles in these magazines directly related to dieting dwindled significantly, and by the late 1930s, they had nearly disappeared. Yet, in 1939, *Ladies Home Journal*, the most popular women’s magazine in the U.S., published a short story that directly addressed weight-loss dieting. In “The Boy Next Door,” author Ursula Parrott attacks women’s efforts and motivations to achieve the prevailing ideal of slender feminine beauty, arguing that a woman could not change her true nature simply by changing her shape.

When Women Hate Men: Influence of Gender Role Belief on Ambivalent Sexist Attitude towards Men. Barnabas Ekpere Nwankwo and Valentina

Chinenye Marire-Nwankwo, Enugu State University of Science and Technology, Enugu, Nigeria

This study investigated gender belief system as a factor influencing ambivalent sexist attitude towards men. Using the systematic sampling method, a sample of 180 females and 156 males was drawn from the University of Ibadan Community for the study. Demographics of the community were reflected in this sample. 65 (19.3%) were postgraduate students, 178 (53%) were undergraduates and 93 (27.7%) were teachers at the International Secondary School Ibadan and Abadina College Ibadan. Copies of a questionnaire on Attitude towards Women Scale (AWS) measuring traditional gender-role beliefs were randomly administered. Ex Post Facto survey design was used. Statistical analyses were carried out using independent t-test and analysis of variance (ANOVA). Results showed that females showed more hostility ($p < 0.01$) and ambivalence ($p < 0.05$) towards men than males. Females who hold traditional gender beliefs expressed more hostility towards men than non-traditional females ($p < 0.001$). Based on the findings of this study, recommendations and suggestions were made for future research.

Researching Women's Lives: Domestic Violence and HIV. Melissa Ponce-Rodas and Krista Cooper, Andrews University

Conducting research on sensitive topics can be challenging, and impacts all aspects of the research process. This presentation will discuss two studies on sensitive topics, one on Hispanic, religious women and domestic violence and the other with Afro-Caribbean, immigrant, HIV-positive women. Both presenters will discuss how they navigated all of the steps in their completed projects, from question formulation, to sample identification, participant recruitment, data collection, interpretation of results and dissemination of findings. The session is meant to be participatory and interactive, therefore questions and discussion are encouraged.

Female Islamic Dress in France. Kristen Canavan, Western Michigan University

In 2003, the French state appointed the Stasi Commission to determine whether or not "ostentatious symbols" should be banned in public schools. Their investigation found that the wearing of Muslim headscarves in public schools defied the principle of secularism and in March of 2004, legislation was passed banning all religious symbols, including the Muslim hijab in public schools. Six years after Law No. 2004-228 was passed, the Sarkozy administration passed a similar law also targeting Muslim women. Known as the "burqa ban" (although the niqab is what a minority of French Muslim women actually wear), Law No. 2010-1192 forbids the concealing of one's face in all public spaces. Within these laws lies an amalgam of themes pertaining to French identity, integration policy,

and Muslim women's stature in French society, all while bearing undertones of neocolonialism. This paper examines the political and feminist discourses found within this sensationalized debate, and argues that the two are as intertwined and problematic as the two laws themselves.

Being a Pastor's Husband. Romulus Chelbegean, Josias Augusto Flores, and Amante Gonzales, Andrews University

Based on both religious prescriptions and cultural norms, for centuries the role of clergy in Christian churches was traditionally assigned to males only. During its denominational history, the Adventist Church created the masculine pastoral role and its feminine counterpart: the pastor's wife or "the shepherdess". However, following the 1970s feminist movement (Hochschild, 1989), the last few decades allowed room in Adventism for considerably more female pastors. According to the last reports (Stele, 2013), currently there are about 320 already ordained women pastors in the Adventist worldwide Church out of which about 120 female pastors serve in the North American Division (NAD). In the meantime, a pool of 140 Andrews Seminary female students is available to fulfill NAD's quinquennial goal of doubling the number of female pastors in its territory (Bernard, 2013). From a family systems perspective, according to Gender Roles Theory (Rivers and Barnett, 2011), this new female clergy gender role is expected to create in turn an unprecedented complementary role: the pastor's husband. This particular study explores the novelty, strain and stress (O'Neil, 2008) of the Adventist pastor's husband role and its potential implications on the marital dynamic of NAD's Adventist female clergy family.

Women Ordination and the Self-Esteem of Adventist Hispanic Women.

Carla Veizaga-Udaeta, Andrews University

The social sciences define self-esteem as a hypothetical construct that is quantified by the overall effective evaluation of one's own worth, value, or importance. This concept makes the assumption that measuring attitudes or evaluating one's self reflects a person's self-esteem. (Blascovich and Tomaka). This study will examine the relationship between the divisive issue of women's ordination in the Seventh-day Adventist church and its relation to the self-esteem of Adventist Hispanic women. Krause (1995) mentioned that previous research in the area of religiosity and self-esteem provides conflicting findings. Some studies indicate that greater religious involvement tends to bolster feelings of self-worth, whereas others suggest that more religious involvement is associated with less positive self-evaluations (Krause, 1995). However, in the present study, the data collected are expected to support the hypothesis that feelings of self-worth tend to be lower for those with high or moderate support of the ordination of women in the global church than those who are less supportive of this unconventional role for women. About 60 middle-class, Adventist subjects will

be used in this survey. Subjects will complete a demographic questionnaire, a collective self-esteem scale, and a brief self-esteem inventory.

Women's Access to Leadership in Madagascar. Ave Altius and Joel Raveloharimisy, Andrews University

Women's involvement in leadership has been increasing worldwide, but there are still wide gaps between men's and women's participation in leadership positions. Only a handful of women have made it to the very top of the political rung of leadership of their countries, and women's access to leadership in other spheres such as business remains low. The purpose of this paper is to explore the factors that determine women's access to leadership positions in politics, government, and public life focusing on the case of Madagascar. The data were collected using a mixed method. Among others, three main reasons for women's participation in leadership were found across the literature explored: gender quotas; kinship ties to leadership, and societal upheaval and revolution. However, upon examination of the special case of Madagascar, reasons were found that explained women's leadership that were not generally found in the literature. The historical legacy of Madagascar, and women's social and political activism and advocacy were found to be the principal factors that affect women's access to and participation in leadership. These findings may have wider implications in explaining women's access to political and other leadership roles.

Zoology

Egg-Laying Synchrony as an Adaptive Response to Egg Cannibalism in a Seabird Colony. Sumiko Weir, Shandelle Henson, James L. Hayward, and Ashley Reichert, Andrews University

Every-other-day egg-laying synchrony, an analog to human menstrual synchrony, has been demonstrated in the Glaucous-winged gull (*Larus glaucescens*) colony at Protection Island National Wildlife Refuge in the Strait of Juan de Fuca, Washington. The predominant cause of egg loss in the colony is cannibalism. Here we show that (1) eggs are most likely to be cannibalized within the first 24 hours after they are laid, and (2) the odds that an egg is cannibalized within the first 24-hours decreases with an increase in the number of eggs laid on that day. This suggests that egg-laying synchrony functions as an adaptive response to cannibalism by maximizing an egg's chance of survival during its most vulnerable period.

Every-Other-Day Ovulation Synchrony, High Nesting Density, and Egg Loss in a Colony of Ring-Billed Gulls (*Larus delawarensis*). Amanda G. Sandler, Andrews University; Libby C. Megna, University of Wyoming; Shandelle M. Henson and James L. Hayward, Andrews University

Recently, every-other-day ovulation synchrony was demonstrated in Glaucous-winged Gulls (*Larus glaucescens*), the first known case of socially induced ovulation synchrony on a daily time scale in non-mammals. Here we report a second case of every-other-day ovulation synchrony, this time in a colony of Ring-billed Gulls (*Larus delawarensis*). As in Glaucous-winged Gulls, the level of synchrony increased with nest density, raising the possibility that ovulation synchrony may confer a selective advantage on gulls nesting at high densities. However, the probability of egg loss in the Ring-bill Gull colony also increased with nest density, complicating any simple adaptive interpretation.

The Behavior of Glaucous-Winged Gull Egg Cannibals. Ashley A. Reichert, James L. Hayward, and Shandelle M. Henson, Andrews University

Cannibalism leads to a variety of behavioral, demographic, and ecological consequences and is influenced by a range of environmental circumstances among numerous taxa. Although multiple studies have linked cannibalism to egg and chick failure in gull populations, few characterizations of gull cannibal behavior and reproductive success exist. During the 2014 breeding season, we observed the territories of 16 Glaucous-winged Gull (*Larus glaucescens*) and Glaucous-winged \times Western Gull (*L. glaucescens* \times *occidentalis*) egg cannibal specialists on Protection Island, Washington, USA. We also monitored cannibal foraging behavior, relative reproductive success, and colony-wide egg loss. Cannibal specialists employed a variety of foraging and feeding behaviors and exhibited significantly lower reproductive success than non-cannibals. Future study of the Protection Island gull colony will monitor long-term trends in cannibalistic activity and behavior in relation to environmental change.

An Acoustical Analysis of Selected Contact Calls of Black-Capped Chickadees in Forested and Residential Habitats. Laura Jessup, Alma College

Birds use vocalizations to communicate with each other in courtship rituals, to warn conspecifics and allospecifics of a threat, and to stay in touch while migrating, among other things. The Black-capped Chickadee (*Poecile atricapillus*) is a highly social Michigan resident species. Both their mating song and other vocalizations such as their tseet and chickadee-dee calls have been well studied. My research is investigating how differences in the habitat structure between forested and residential areas influences the acoustic structure of an individual's call. The trend towards urbanization of rural areas makes this type of research especially relevant. I investigated the variation in peak frequency, bandwidth, and the number of syllables in the tseet and chickadee-dee calls of Black-capped Chickadees in forested vs. residential habitats. Five forested habitats of similar composition and five similar residential locations were chosen as recording sites. All vocalizations were recorded in late fall of 2014. I will analyze these data using T-tests.

The Effect of Varying Sound Intensities on Phonotactic Selectivity in Female *Acheta domesticus*. Re'Jeanne Greene and Benjamin Navia, Andrews University

The intensity of the calling songs to which a female cricket *Acheta domesticus* is most likely to start responding phonotactically has been reported to be around 55dB at a carrier frequency of 4 – 5 kHz. These reports, however, have not shown selective phonotaxis to occur at such low intensities. Preliminary data from behavioral experiments have demonstrated that (i) in response to calling songs with intensities above 75dB, females are more likely to exhibit selective phonotaxis in response to a full sequence of calling songs with varying syllable periods (30–90 ms); and (ii) in response to calling songs with intensities below 75 dB the same females are less likely to respond selectively to identical stimuli. By testing all three intensities, 85dB, 75dB, and 60dB, at various syllable periods, we intend to find the threshold intensity at which a female cricket will exhibit selectivity in their phonotactic choices.

The Effect of Calling Songs with Multiple Frequencies in Cricket Phonotaxis. Benjamin Navia and Delia Frey, Andrews University

Female cricket *Acheta domesticus* exhibits selective phonotaxis in response to model calling songs with intensities above 75 dB and a carrier frequency of 4–5 kHz. When the animal is exposed to calling songs with varying syllable periods (30–90 ms), it is more likely to perform phonotaxis to calls with syllable periods that approach the most attractive range (50–70 ms), hence demonstrating its selectivity. On the contrary, it is less likely to respond phonotactically to calling songs with syllable periods that deviate from the most attractive range. Higher frequency sounds (16 kHz), have been reported to produce an aversive effect on the animal, reducing its likelihood of responding phonotactically to such calls. We hypothesized that an attractive calling song can become unattractive by adding a 16 kHz component to an already existing 5 kHz call. In this experiment, young females (5–7 days) were behaviorally tested to 5 kHz, 85 dB calling songs, followed by a 16 kHz call added in at 65 dB to the existing call. The intensity of the 5 kHz component remained unchanged, while the intensity of the 16 kHz component varied. Preliminary results suggest presenting a combined stimulus leads to negative phonotaxis.

The Effects of the Copulation Song and Other Disturbances on the Frequency and Synchronization of Reproductive Behaviors in Gulls (*Larus glaucescens*). Gordon Atkins, Andrews University and M Flemming Nature Center; Amanda Sandler, Ashley Reichert, Shandelle M. Henson, and James Hayward, Andrews University

Under appropriate density and environmental conditions, Glaucous-winged Gulls synchronize their ovulation and egg-laying with their neighbors on an

every-other-day schedule. We are examining what the cues might be used to signal this synchrony within the colony. Hourly broadcasts of model copulation songs to a small nesting population, did not increase head tossing or mounting behaviors but the broadcasts did synchronize both head tossing and mounting to the first 15 min after the stimulus. Controls using no sound did not affect synchrony of reproductive behaviors. Controls using a non-gull sound of similar intensity and spectral components, but with a modified temporal pattern, caused an increase in reproductive activity but did not synchronize head tossing or mounting. Human disturbance caused some synchrony of head tossing but not mounts. Preliminary ongoing evaluation suggests that eagle disturbances also affect rates of head tossing and mounting but within a longer time frame. These results suggest that the copulation songs of neighbors possibly combined with other stressors in the colony, might contribute to the synchrony of ovulation in gull populations.

Effects of the Enzyme Inhibitor, Thiouracil, on Measures of Development, Metamorphosis, and Behavior in Two Species of Fruit Flies. Kelsey Gere, Vanessa Wolf, and Gary M. Lange, Saginaw Valley State University

Endocrine disrupting compounds are those that exert effects on aspects of the neuroendocrine system in organisms, and may alter an organism's physiology, morphology, development and behavior. Thiouracil is an historically relevant compound used in human medicine since the early 1940s to treat cases of hyperthyroidism and Grave's Disease. The chemical nature of thiouracil is such that it inhibits the enzyme thyroid peroxidase. Thiouracil behaves as a thyrotoxic agent, inhibiting oxidation of iodine leading to suppressed or inhibited thyroxine production in the thyroid gland. Thiouracil has also seen application in commercial agriculture, where it has been used as a fattening agent in cattle. This study assesses the effects of thiouracil in the invertebrate animal models of two species of fruit fly (*Drosophila melanogaster* and *Drosophila virilis*). Physiologically relevant exposures could induce effects on the timing of growth, development and behavior in the invertebrate system even though their hormone profile is vastly different than that seen in mammals. Specifically in this presentation, focus is on how thiouracil exposure has affected the developmental time line of the fruit fly, and comparisons of rover/sitter behavior in larvae, pupation heights in pupae, and locomotor measures in adult flies.

Effects of Nicotine on Development, Metamorphosis, and Behavior of the Fruit Fly (*Drosophila melanogaster*) within and across Generations. Thomas Beechum, Jennifer Buchner, Audrey Jeglic, Diane Marion, Jamie Roggenbuck, Thomas Trinklein, and Gary M. Lange, Saginaw Valley State University

Nicotine is a potent cholinergic alkaloid found in the nightshade family of plants, with tobacco being the major plant source for this chemical worldwide. Nicotine serves as an antiherbivore chemical for the plant, but recreational

consumption by humans is widespread due to its stimulant effect on the brain. Nicotine consumption is dependence-forming due to its effects on dopaminergic pathways, where it increases levels of dopamine in the reward circuits of the brain. It is also known that nicotine inhibits histone deacetylases systemically. These enzymes affect the position of acetyl groups, altering the wrapping properties of histone interaction with DNA. Therefore, nicotine may exert potential epigenetic effects.

In our understanding of the effects of nicotine, little assessment of the potential for this chemical to affect growth, development and behavior in invertebrates has been undertaken. This is because most invertebrate work examines much higher dosage exposures associated with nicotine's use as an insecticide. In this study, we examine how chronic, low-level nicotine exposure in the fruit fly (*Drosophila melanogaster*) affects development, morphology, metamorphosis, fecundity, and behavior. Additionally, we examine effects chronic nicotine exposure may exert across multiple generations of the fly.

L3 Auditory Interneuron Responses to Dual-Frequency Calling Songs in Female Crickets (*Acheta domesticus*). Jeong Bin Lee, Andrews University

Female crickets *Acheta domesticus* exhibit selective phonotactic behavior, in response to calling songs with a carrier frequency of 4–5 kHz, an attractive syllable period, and other temporal parameters. Of the previously identified ascending prothoracic auditory neurons that could possibly have a role in recognition, only L3 has been proposed to be involved in syllable period selective response. Preliminary data show that females exhibit stronger phonotactic selectivity to calling songs with intensities above L3's threshold than to calling songs with intensities above L1's threshold but below L3's threshold. Furthermore, in response to calling songs with attractive syllable periods, L3 exhibits a syllable period-selective decrement, which has been correlated with selective phonotaxis. Also, recent behavioral experiments demonstrate that female crickets do not exhibit phonotaxis in response to calling songs with 16 kHz and 5 kHz components. Such preliminary results further support the hypothesis of L3's involvement in selective behavior, as calls with 16 kHz frequency have been correlated with aversive behaviors and only L3 responds to such frequency. Based on such data, L3's responses to simultaneous 16 kHz and 5 kHz calling songs will be examined, thereby further establishing the connection between L3's selective decrement responses and selective phonotactic behavior.

The Relationship between Equine Temperament and Behavior as Affected over Time by the Skill Level of the Riders. Taylor Huffman, and Katherine Koudele, Andrews University

It has been the observation of those operating summer camp horse riding programs that the incidence of undesirable behaviors by the horses increases over

the course of the summer. The goal in this study is to observe the incidence of undesirable behaviors (bolting, kicking, shying, etc.) by horses at a summer camp and determine if it could possibly be explained by the stress of being ridden by riders with a wide range of ability during the course of a camp season (9 weeks). It is also hypothesized that the incidence and severity of undesirable behavior will be related to the temperament of the horse, i.e., horses with a passive social or passive aloof temperament will be able to adjust with the most ease to varying rider skill levels while those with a more fearful, or aggressively social temperament would have more incidents of misbehavior. Each horse was evaluated for temperament at the beginning of the summer camp season when a horse would be the most rested. In the following weeks every rider received an evaluation for riding skill level and all incidents on trail rides and the lengths of those rides were recorded. Results analysis is in progress.

An Experimental Design: Effects of Aromatase Inhibition and Endocrine Disruption on Neural, Morphological, Reproductive, and Behavioral Differentiation in the Norway Rat (*Rattus norvegicus*). Cassidy Florey, Emily Greeson, Stephen Holihan, Nicholas Toupin, and Gary M. Lange, Saginaw Valley State University

Genetic sex of an organism drives phenotypic development of morphology. However, experiments manipulating embryonic environments in oviparous models have demonstrated phenotypic sex expression opposite of genotype is possible. Currently, no viviparous organism has been experimentally induced to develop phenotypic sex opposite of genotype. Significant differences in viviparous models preventing phenotypic expression opposite of genotype involve the robust stability of the intrauterine environment. We theorize use of a triplet chemical cocktail, specifically an aromatase inhibitor plus two endocrine disrupting compounds, may reshape the mammalian intrauterine environment to allow phenotypic expression of sexual morphology opposite that of genotype in mammals. We present our experimental design where we strive to induce phenotypic sex development opposite of genotype in the Norway rat. In our research model, sexually indifferent morphology is maintained through gestational day 10. Our chemical mixture will be introduced to the subjects during this undifferentiated stage through parturition. Administration of the chemical triad may impact gestation in ways that may alter development resulting in changes in post-natal behavioral and morphological tests. By comparing control and treatment populations at the neural, morphological, reproductive, and behavioral levels, we hope to gain understanding of the mechanisms driving sexual differentiation in mammals.

Determining Social Preferences of Holstein Cows Based on Stall Selection. Yoona Kang and Katherine Koudele, Andrews University

Cows, like other animals, have dominance hierarchies but there is anecdotal evidence that cows also have preferred herd mates with whom they spend more time. This research project sought to gain more detail about cow social groups at the Andrews University Dairy in two ways: (1) to determine the relative social ranking of cows within two different lots of approximately 130 cows each, and (2) to determine the social groupings within each lot. The dominance ranking was inferred by which cows occupy the more desirable stalls. The barn is on a 2% slope and the stalls at the upper end of the barn have shown to have a higher occupancy rate than the lower stalls thereby implying that they are more desirable. The social groupings were determined by which cows lie near each other more often over the course of the observations which were in the evenings after milking and feeding. The cows are grouped into lots by age so there is also the possibility that the social dominance order and herdmate preferences may change over time. The data have been collected and are in the process of analysis.

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