SYMPOSIUM

TENTH ANNUAL UNION UNIVERSITY SCHOLARSHIP SYMPOSIUM

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TUESDAY, APRIL 30, 2013

Reception for Participants, Faculty *and* Outside Guests
Carl Grant Events Center 12:00–12:30 p.m.

Afternoon Concurrent Sessions

Dept.	Room	Student Presenters	Time
Poster Displays	Grant Events Center	Patrick Joseph, Bekka Duong, Zeke Kurcab, Drew Wilkinson, and Parwinder Singh (BIO) Paul Neal and Wesson Smith (BUS) Samantha Howard (CHE) James Clary (CHE) Chase Bouchillon (CHE) Jon Vunk, Zachary Wadley, Joshua Guthrie, Andrew Tan, William Duncan, Cody Giles, Eric Ramirez, Shane Caver, Taylor Mayo, Lydia DeWolf, Matthew Bentley, and Chris Love (EGR) Todd Jones, Dylan Baker, and Kian Jost (EGR) Jon Vunk and Zachary Wadley (EGR) Rachel Carbonell and Ky Bailey (EGR) Brady Sheppard and Zac Baker (EGR) Grace Morriss and Matt Wilson (EGR) Rebecca Sharpe and Alex Charles (EGR) Alex Wainscott, Cody Giles, Taylor Mayo, and William Murray (EGR) Kathy O'Connor Wray (NUR) April Yearwood (NUR) Denise Thornton Orr (NUR) Darel Davis, Quintrisa Harden, Charlotte Stephens (NUR) Traci Abram, Melissa Lefave, and Elizabeth Vega (NUR) Lepaine McHenry, Dawn Henderson, Rachel Barber, and Cathy Ammerman (NUR) Phyllis Moore, Malinda Conrad, Karen Davis, and Tara Mabon (NUR) Rene' Stark, Beth Schultz, and Veneine Cuningkin (NUR) Roxanne McMurray (NUR) Paulina Williamson, Kellie Logue, Carrie Shuler, Jenny Williams, and Magen McCulloch (NUR) Brian Foster (NUR) Rhonda Oldham and Debi Sampsel (NUR) Jennifer Langhans, Shelia Settlemeirs, Denise Stokes, Craig Metcalf, Brittany Harris, and Wendy Pevahouse (NUR) Jonathan Gipson, Lori Holladay, Rachel Holmes, Linda Williams, and Sarah Wilson (NUR) Amy Little, Leigh Ann Keel, Janna Britt, Patricia Fannon, and Leslie Tenpenny (NUR) Anna Woodruff, Charlene Phillips, Jennifer Sanders, Ashley Talley, and Shanytel Weathersby (NUR) Elizabeth Card, Christy Egbert, Ann Jenkins, Janelle Scullark, and Crystal Simpson (NUR) Steven Garvin, Jonathan Bomar, Matt Milby, Lauren Siebrase, and Jeffery Tackett (NUR)	12:30–1:30 p.m.

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SCHEDULE

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		Rachel McCoy, Mary Claire Harlow, Heather Malone, Brittany Pastor, and Shannon Lopez (NUR)	
		Tanya Cockrell, Lekeisha Lewis, Christina Maclin, Kori Swearengen, and Crystal Watson (NUR)	
		Keith Gist, Ashleigh Gentles, Anna Rojas, and Emily Wiltse (NUR)	
		Jana Combs, Lefonda Hill, Colby Ross, Stephanie Sells, and Christy Tipton (NUR)	
		George Li, Wednesday Luzano, Kevin Madden, Misha Nizamov, and Jereme Raley (NUR)	
		Shunta Chevis, Cheryl Dodson, LaRonda Gant, Charlotte Rose, and Barbara Seay (NUR)	
		Alecia Breakfield, Erica Grissom, Dawn Whybrew, Amanda Croley, and Melissa Hill (NUR)	
		Angela Gipson, Fhteachia Andrews, Ashley Nabors, Danielle Rosser, and Worthy Walker (NUR)	
		Lauren Russell, Taylor Brooke McLean, Jennie Kellams, Angela Foundation, and Karin Randolph (NUR)	
		Rachel Mitchell, Blair Myers, Vennessia Cunningham, Shelly Meiners, and Shannon Beville (NUR)	
		Deborah Fork Sampsel (NUR)	
		Lacie Hatcher (PHARM)	
		Rebecca Tarleton and Holly Beth Brooks (SW)	
		Rebecca Evans, Anika Strand, and Morgan Turner (SW)	
ART/MUS/HIS/PSY	**PAC D-3**	Betsy Marsh (ART)	2:00 p.m.
Session Chair:		Madelyn Carson (MUS)	2:20 p.m.
Joshua Veltman		Ellen Cline (ART)	2:40 p.m.
		William Burke (MUS)	3:00 p.m.
		Blake Giles (MUS)	3:20 p.m.
		Patricia Dawson (HIS)	3:40 p.m.
		Jeffrey Paul, Joshua Morgan, Lydia Dahl, Ariell Beasley, and Darcie Williams (PSY)	4:00 p.m.
BIO	**WH 101**	Ryan Mantooth	1:40 p.m.
Session 1 Chair:		Travis Shutt	2:00 p.m.
Andy Madison		Chelsea David	2:20 p.m.
		Mark Kartzinel	2:40 p.m.
		Jeffrey Hirtes *Break 3 p.m.*	3:20 p.m.
		Andrew DiBenedetto	3:40 p.m
		Liane Gozmao	4:00 p.m.
BIO	**WH 102**	Evan Hare	1:40 p.m.
Session 2 Chair:		Daniel Kelley	2:00 p.m.
James Kerfoot		Juliana Cobb	2:20 p.m.
		Justin Bryan	2:40 p.m.
		Will Johnson *Break 3 p.m.*	3:20 p.m.
		Justin Williams	3:40 p.m.
		Patrick Joseph, Bekka Duong, Zeke Kurcab, Drew Wilkinson, and Parwinder Singh	4:00 p.m.
CSC	**PAC D-54**	Jamie Fox	1:40 p.m.
Session Chair:		Nathan Webb	2:00 p.m.
Jim Kirk		Dillon Lisk	2:30 p.m.
		Luke Ferguson	3:00 p.m.
		Jordan Haskins and Evan Barnett	3:30 p.m.

DMS	**JEN 225**	Claire Bassford (COM)	1:30 p.m.
Session Chairs:		Katie Cooper (COM)	2:00 p.m.
Cam Tracy		Jeff Thompson (COM)	2:30 p.m.
		Michael Cole (COM)	3:00 p.m.
		Matthew Cole (COM)	3:30 p.m.
		Abigail Addison (ART)	4:00 p.m.
		Mason Freeman (ART)	4:30 p.m.
ENG	**Theatre**	Zena Chmielewski, Chelsea Cothran, Becca Farrell, Rebecca Edgren, Jessica Ferrell, Kurtis Gallop, Kalee Hall, Taylor Hare, Josiah Hubin, Jonathan Kerr, Laura Little, Mary Beth Massey, Megan Pinckard, and DeShuni Sanders	2:00 p.m.
Session Chair:			
Gavin Richardson			
EGR	**PAC A-7**	Phillip Johnson, Ryan Substad, and James Avery	1:30 p.m.
Session 1 Chair:		Rachel Carbonell, Jonathan Gwaltney, Joel Ingram, and Caroline McConnell	1:50 p.m.
Randal Schwindt		Ky Bailey, Tom Drury, Rebecca Sharpe, and Jon Vunk	2:10 p.m.
		Matt Wilson, Wilson Holland, Brady Sheppard, and Scott Kahler	2:30 p.m.
		Alex Charles	2:50 p.m.
EGR/PHY	**PAC A-9**	Betsy Olson (PHY)	2:00 p.m.
Session 2 Chair:		Michael Lam (PHY)	2:25 p.m.
Bill Nettles		Jeffrey Lewoczko (PHY)	2:50 p.m.
		Matthew Bentley, Lydia DeWolf, Joshua Guthrie, and Chris Love (EGR)	3:15 p.m.
		David Adams, Shiva Hemmatian, Taylor Mayo, and Alex Wainscott (EGR)	3:35 p.m.
		Shane Caver, Andrew Tan, Will Duncan, and Eric Ramirez (EGR)	3:55 p.m.
ICS/SOC	**BAC-43**	Purity Ogolla (ICS)	1:40 p.m.
Session Chair:		Holly Jay (ICS)	2:00 p.m.
Cynthia Jayne		Rachel Harkins (ICS)	2:20 p.m.
		Leandra Hosfield (ICS)	2:40 p.m.
		Louisa Saratora (ICS)	3:00 p.m.
		Brandy Hudson (ICS)	3:20 p.m.
		Stephanie Smith (ICS)	3:40 p.m.
		Tenneisha Lowe (ICS)	4:00 p.m.
		Tyler Glodjo (ICS)	4:20 p.m.
		Courtney Rankin (SOC)	4:40 p.m.
BUS/EDU	**BAC-44**	Zhang Yu (EDU)	2:00 p.m.
Session Chair:		David W. Webb (EDU)	2:20 p.m.
Terry Weaver		Sarah Hill (BUS)	2:40 p.m.
		Leah Rice Watkins (EDU)	3:00 p.m.
THM	**JEN 325**	Paul Christensen	1:40 p.m.
Session Chair:		Ryan Linkous	2:00 p.m.
James Patterson		Mark Waite	2:20 p.m.
		Will Miller	2:40 p.m.
		Tucker Watson	3:00 p.m.
		Daniel Stands	3:20 p.m.
		Jason Kriaski	3:40 p.m.
		Matt Arnold	4:00 p.m.

ART

Black Humor: The Artistic Temperament and Albrecht Dürer's Melencolia I

Presenter: Betsy Marsch
Faculty Advisor: Haelim Allen

The familiar stereotype of artists as moody, inspired and often insane has its origins in classical antiquity. In Greek thought the four bodily humors govern human types, resulting in four temperaments: the choleric, the phlegmatic, the sanguine, and the melancholic. The melancholic or saturnine temperament, associated with depression, insanity, and genius, was the complexion which artists were said to possess. Due to tensions between the Renaissance respect for the artist and the Protestant Reformation's emphasis on word over image, artists began to contemplate their place in society and investigate their own temperaments through their artwork. This paper explores these circumstances and their influence on the German artist Albrecht Dürer, whose engraving Melencolia I offers insight into his conflicted role as an artist in a bewildering milieu.

Kurt Schwitters's *Merzbau*: A Forerunner of Installation Art

Presenter: Ellen Cline
Faculty Advisor: Haelim Allen

Kurt Schwitters' *Merzbau*, a three-dimensional collage takeover of the artist's living quarters, was destroyed in an Allied bombing raid in 1943. However, the influence of Schwitter's art-making philosophy remained. In keeping with Dada ideas about breaking down conventional notions of art, Kurt Schwitters did away with the distinction of a separate, aesthetic space for art. Instead of showing a painting in a gallery, Schwitters saw the whole space of the *Merzbau* apartment as his canvas, merging the social and the aesthetic within his own space. Through his use of unconventional media and multiples, his activation of space, and his blurring of the distinction between art and life, Schwitters laid the groundwork for what has become installation art. ■

BIOLOGY

Measuring the Effects of Beta-2-Glycoprotein-1 on Thrombin Production Through Direct Inhibition and the Prothrombinase Complex

Presenter: Ryan Mantooth
Faculty Advisor: Marc Lockett

The serum glycoprotein β_2-glycoprotein 1 (B2GP1) is an apolipoprotein with many functions, several of which are still poorly understood. B2GP1 is known to bind a wide range of anionic molecules, including phospholipids and platelets, and it also binds cardiolipin and antiphospholipid antibodies. The anionic phospholipid-binding property of B2GP1 is of particular interest because this property allows B2GP1 to inhibit the intrinsic pathway of coagulation. Anionic competitive binding of B2GP1 to pro-coagulant membranes is also known to inhibit the generation of tissue factor Xa. This work compared thrombin production by the prothrombinase complex in the presence and absence of B2GP1, using a reaction mixture containing factor Xa, factor Va, prothrombin, and Ca^{2+}. Quantification of thrombin generation used a chromogenic thrombin substrate. We hypothesized that interaction between B2GP1 and phospholipid membranes will reduce thrombin generation by prothrombinase.

Green Fluorescent Protein as an Indicator of FXa and Thrombin Inhibitors Using PCR Mutagenesis

Presenter: Travis Shutt
Faculty Advisor: Mark Bolyard

The main objective of this research is to develop a novel tool to test for inhibitors of coagulation cascade enzymes factor Xa (FXa) and thrombin using a modified green fluorescent protein (GFP) as a substrate. This was performed using polymerase chain reaction (PCR) mutagenesis to insert FXa and thrombin recognition sequences near the 10th and 11th strand of the GFP protein. These 2 strands are vital to fluorescence and when lost from the protein through proteolytic cleavage, fluorescence is greatly reduced. Efforts have been ongoing to create these modified GFP proteins but the results to this point have been inconclusive. Modified plasmids have been created with PCR mutagenesis, but clones containing successful inserts that glow have not been isolated. More research will be needed to find the successful mutants and determine their change in fluorescence when digested with FXa or Thrombin.

Interference of Tannin and Secondary Metabolites with DNA Barcoding in Angiosperms

Presenter: Chelsea David
Faculty Advisors: Carol Weaver and Wayne Wofford

DNA barcoding is a valuable scientific tool that uses short DNA sequences to rapidly and effectively identify species. The coding *rbcL* gene has proved to be a valuable region for discrimination between plant species due to its fairly high rate of divergence. Land plants are known for being difficult to extract DNA, perform PCR, and barcode. The objective of this research was to help develop the method of DNA barcoding for land plants and make it more efficient for angiosperms. DNA from several members of genera *Quercus* and *Acer* was isolated, amplified, and examined at several times during the year. It was determined that floral buds collected in early spring and leaves collected late in the fall were inadequate for barcoding due to the inability to extract and amplify the *rbcL* gene. This was suspected to be due to high levels of tannin and secondary metabolites in the different matrices.

Assessing the Effects of Priority Growth and Competition of Microstegium vimineum on Monarda Fistulosa

Presenter: Mark Kartzinel
Faculty Advisor: Michael Schiebout

Japanese stiltgrass (*Microstegium vimineum*) is an invasive species that competes with indigenous plant species of the southeastern United States. In a greenhouse environment, we grew the native herb species wild bergamot (*Monarda fistulosa*) in competition with stiltgrass examining effects of competition and priority growth. We set up a control with the bergamot growing individually and 2 treatments containing both species growing together. In the first group, the seeds were planted concurrently while in the other group the invasive was allowed to establish before planting the native. Following 7 weeks of growth, we recorded 5 variables: average end height, average percent germination, average aboveground and belowground biomass, and average percent survivors. No variables were significantly different between treatments or with the control (MANOVA: Wilk's Lambda=0.661, F(12,84)=1.61, p=0.105). Overall our results indicate that stiltgrass does not significantly inhibit or help the growth of wild bergamot regardless of prior establishment of stiltgrass.

The Effect of Temperature on Feeding Ability in Tiger Bass

Presenter: Justin Bryan
Faculty Advisor: J.R. Kerfoot

The effects of temperature on feeding were examined in the tiger bass, F1 hybrid crosses (*Micropterus salmoides salmoides x Micropterus salmoides floridanus*). Five individuals were filmed at 16, 18, 20, 22, 24, 26, 28, 30, and 32° C. The bass were acclimated at each temperature for 24 hours before filming and each bass was filmed feeding at 300 frames per second on a goldfish (*Carassius auratus)*. The films were analyzed using Tracker software, and these three variables were measured: attack velocity, length of feeding bout, and time to maximum gape. The repeated measures MANOVA showed that feeding

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BIOLOGY

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was equal across all temperatures with no influence of repeatedly measuring individuals over time. The regression analysis revealed that for each dependent variable there was no relationship between each dependent variable and temperature. With these results, it was concluded that there was no effect of temperature on the feeding of tiger bass.

Developing an Assay in the Analysis on Poly(ethyleneglycol)-induced Fusion of Spleen Cells with Myeloma Cells using CalceinAM and R18 Fluorescent Labeled B Lymphocytes

Presenter: Andrew DiBenedetto
Faculty Advisor: Jennifer Gruenke

The conditions required for fusion of myeloma cells with B-cells are very specific. In order to determine the effectiveness of such conditions an assay must be developed to test for successful cell fusion. This experiment tested different concentrations and incubation times of CalceinAM with spleen cells of BALB/c (*Mus musculus*) examining for leakage of CalceinAM to myeloma cells in the process of cell fusion, providing a better assay for determining successful hybridoma cell fusion. This experiment tested similar conditions for labeling with Octadecyl Rhodamine B Chloride (R18). Following spleen cell removal, the cells will be incubated with Calcein AM and R18 and then fused with myeloma cells using polyethylene glycol (PEG) as a membrane fusion inducer. Preliminary results have shown effective double labeling with increased efficiency after adding CPZ. Further quantification will be needed to provide more detail about efficiency.

Determination of Diatomaceous Earth Effectiveness on Parasite Accumulation in Horses

Presenters: Patrick Joseph, Bekka Duong, Zeke Kurcab, Drew Wilkinson, and Parwinder Singh
Faculty Advisor: James Mahan

This experiment was designed to determine the time course of diatomaceous earth effectiveness on intestinal parasite loads in horses. Fecal samples were obtained from 3 horses that were not being subjected to diatomaceous treatment. Once the initial samples were acquired, the horses were placed on a diatomaceous diet. Subsequent samples were taken on the third, sixth, ninth, twelfth, and fifteenth days. All samples were subjected to egg flotation using a sugar-salt solution and centrifugation.

Examining Wildlife Populations in Urban vs. Rural Areas in West Tennessee

Presenter: Will Johnson
Faculty Advisor: Andrew Madison

The study compared species like the grey squirrel (Sciurus carolinensis), white-tailed deer (Odocoileus virginianus), raccoon (Procyon lotor), nine-banded armadillo (Dasypus novemcinctus) and opossum (Didelphis virginiana) present in areas and the relative density of each species in rural and urban settings. Using infrared motion sensing cameras, pictures were captured from October 2012 through March 2013 at three different distances from the center of Jackson, Tenn. Urban sites were within 2 km, rural sites were between 2 and 7 km, and control sites were beyond 7 km. The data showed a greater frequency of sightings in urban areas than rural and control areas. The results did not match the initial hypothesis predicting a greater frequency of sightings in the control areas followed by rural then urban. The results can be attributed largely to smaller home ranges, sufficient food, and non-avoidance to human activity.

Development of An Assay to Test For Inhibitors of Coagulant Enzymes Factor Xa and Thrombin

Presenter: Liane Gozmao
Faculty Advisor: Mark Bolyard

Anticoagulants are substances that have been developed to prevent blood clotting and treat patients with blood clotting or coronary disorders. Clot formation occurs in response to an injury and is caused by a series of reactions that activate enzymes such as thrombin and Factor Xa. The primary objective of this experiment was to create a recombinant tool to detect novel anticoagulants using *Escherichia coli* cells containing pGLO plasmids. Restriction digests were used to insert a thrombin or Factor Xa recognition sequence into DNA encoding the green fluorescent protein (GFP). Successful inserts were identified through restriction digests and gel electrophoresis. A Factor Xa sequence appeared to be successfully inserted at the Xho I site. Positive clones were sequenced by Washington University in St. Louis, Missouri. These recombinant tools will be able to be used to test for natural anticoagulants in hematophagous organisms such as ticks and fleas.

Influence of Temperature on Prey Escape Success between *Gambusia affinis* and *Belonesox belizanus*

Presenter: Justin Williams
Faculty Advisor: James Kerfoot

Invasive species can potentially cause devastating damage to ecosystems and endemic populations, resulting in billions of dollars spent annually in efforts to manage populations and repair damage. Nonnative species introduced into new habits are no longer governed by the normal limiting factors responsible for their survival and evolution. Yet much is still to be learned regarding the regulatory factors responsible for establishment of exotic species and their dispersion. This study attempted to contribute to a better understanding of this mechanism by analyzing the potential effects of temperature on prey escape success between *Gambusia affinis* (mosquito fish) and *Belonesox belizanus* (pike killifish). Video recordings of feedings at various stages of growth were analyzed for distance between predator and prey, prey escape velocity, and the success of the escape. Rates were then computed using a Q_{10} temperature coefficient comparison to determine the dependence of the mechanism on temperature.

The Evaluation of Ticks In West And Middle Tennessee For *Rickettsia* Bacteria

Presenter: Evan Hare
Faculty Advisor: James Mahan

Rocky Mountain spotted fever is a disease frequently diagnosed in Tennessee, but the bacterium traditionally thought to cause this disease (*Rickettsia rickettsii)* is rarely found in the state. This study attempted to identify *Rickettsia* species in West and Middle Tennessee through the analysis of collected ticks via polymerase chain reaction. It was hoped that the data collected in this experiment might shed light on whether several species of *Rickettsia* are responsible for the incidence of Rocky Mountain spotted fever in this region. Problems encountered when attempting to isolate tick and bacterial DNA from preserved ticks caused few results to be collected.

The Effects Waste Water Inputs Into Local Fresh Water Sources Have On Aquatic Eustrongylides Species Population

Presenter: Daniel Kelley
Faculty Advisor: Marc Lockett

It has been demonstrated that *Eustrongylides* species parasites have a negative impact on organisms within a fresh water aquatic environment. *Eustrongylides* species parasites have a life cycle that involves infecting fish as intermediate hosts and finally infecting waterfowl as a definitive host. Fish were collected from 2 freshwater sites that are sections of the South Fork Forked Deer River that are near waste-water inputs. After the fish were collected, all 168 fish were dissected for detection of parasite incidence. Via dissection, 7 *Eustrongylides* species parasites were discovered. A correlation was explored between the impact pollution has on populations of *Eustrongylides* species parasites and the rate of infection in the collected fish.

Testing Potential Growth Stimulators in the Production of Hybridoma Cell Lines

Presenter: Juliana Cobb
Faculty Advisor: Jennifer Gruenke

Generation of monoclonal antibodies is dependent on the successful fusion and survival of activated B-lymphocytes with myeloma cells. As many biological assays, clinical diagnostic tests, and many new drugs rely on monoclonal antibody technology, there is an increasing need to produce these molecules in a reliable manner. This research compared the growth-promoting effects of dexamethasone, zinc, insulin-transferrin-selenium, insulin (ITS), and conditioned media supplementation of hypoxanthine, aminopterin, and thymidine (HAT) cell culture media on the survival and proliferation of B-cell hybridomas. In addition, the same media additives were examined for their growth-enhancing effects on un-fused myeloma cells when added to high glucose culture media.

Gram Staining Gram Positive Bacteria

Presenter: Jeffrey Hirtes
Faculty Advisors: Mark Bolyard and Cathy Huggins

It is recommended when performing gram stains to use a bacterial culture that is twelve to eighteen hours old. This is because bacteria that are actually gram-positive will appear gram-negative once the culture has reached a certain age. Gram-negative bacteria will stain as gram-negative regardless of how old the culture is. In this project, six different species of gram-positive bacteria are grown at different temperatures in order to find out whether temperature has an effect on the time it takes for the bacteria to begin to stain as gram-negative. Also, it is being investigated whether different samples of the same bacterial species, grown in the same temperature and other conditions, will begin to stain as gram-negative after different durations of time. Gram staining is done at two hour intervals on all of the cultures from when they are twelve to thirty-six hours old. ■

BUSINESS ADMINISTRATION

Camp Doublecreek Safety Strategy

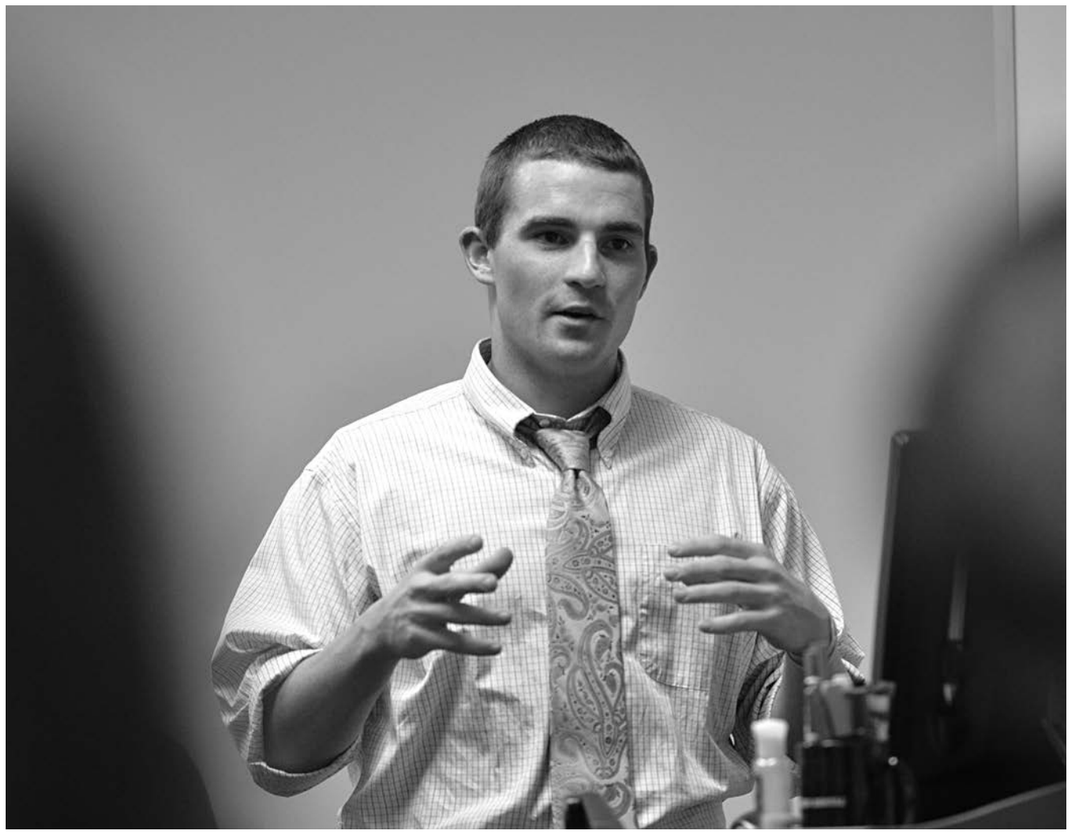
Presenters: Paul Neal and Wesson Smith
Faculty Advisor: Andrew Tiger

In the wake of shootings such as the ones in Aurora, Colorado and Newtown, Connecticut, safety of the general public and our children has become a key issue. Camp Doublecreek in Round Rock, Texas is a day camp that hosts children ages 4 to14. Using the simulation software Simul8, we have built a computer model of this camp to formulate an evacuation policy for times of adversity. The model takes into account distances between the buildings and by this the software formulates the time it takes to move from place to place. The end result helps to understand the length of time it takes to remove all children from the campus to the designated safe areas. We have collaborated with the camp itself and the results of this model will be presented to them so they may know what to expect in keeping their children protected.

Twitter as a Marketing Tool

Presenter: Sarah Hill
Faculty Advisor: Wilburn Lane

This research examines why people get Twitter accounts, how they use them, and how Twitter may be used by marketers to communicate with potential customers. Answers to these questions are examined in light of twitter users' demographic characteristics and their use of various social media. T-Tests, Analysis of Variance, Binary Linear Regression, and Hierarchical Linear Regression were used to examine the variables. The results indicated that the primary reason for getting a Twitter account was to connect with friends—following a business on Twitter was a very low priority. Females are more likely to follow a celebrity on twitter, and they are likely to want tweets from businesses about the availability of new products. Twitter users indicate that they like to get tweets from business regarding price discounts. This research supports the idea that Targeted Location Advertising (TLA) is likely to be very successful. ■



CHEMISTRY

Incorporating Green Chemistry Principles into Development of AP-Level Labs for Qualitative Analysis, Redox Titration, and Enthalpy of a Reaction

Presenter: Samantha Howard
Faculty Advisor: Sally Henrie

Many colleges and high schools across the nation are concerned about potential health hazards and disposal costs associated with typical laboratory experiments. This project focuses on developing a laboratory manual that utilizes "greener" experimental procedures for advanced placement and general chemistry courses. It also teaches students about green chemistry and the growing need for its use in chemical processes. Topics for these experiments were based on the College Board's recommendations for an AP chemistry course. Additionally, these experiments were designed to be incorporated into a web-based kit so that experiments may be safely conducted even in non-traditional settings. This research specifically developed laboratory experiments where students investigate qualitative analysis, oxidation-reduction titrations, and enthalpy of a reaction.

Computational Studies of Quantum Mechanical Calculations of Benzene and Water Using Multiscale Chemical Simulations

Presenter: James A. Clary
Faculty Advisor: Michael Salazar

Multiscale modeling of chemical systems has gained popularity as it is highly efficient at describing chemical phenomena. Computational scaling difficulties arise due to the large expense of the quantum mechanical (QM) calculations that are necessary to describe many systems. Employing fast numerical interpolations based on the QM potential energy and force surfaces is a powerful way of reducing this computational load. The Accelerated Molecular Dynamics with Chemistry (AMolDC) code is a method that performs such interpolations of QM surfaces for direct-dynamic simulations of complex chemical systems. Work was done to optimize maximum error constraints of the interpolant and to examine the acceleration of the optimized method. The accurate numerical interpolations resulted in linear scaling as a function of system size for the hydrated benzene systems that were examined.

Building an Automated Crystal Growth Chamber

Presenter: Chase Bouchillon
Faculty Advisor: Joshua Williams

An automated crystal growth chamber was constructed. The chamber is under software control which gives the user the ability to have precise temperature control over the growth solution and initialize key sequences in the crystal growth process from a computer. A major consideration in the design of the system was to build the chamber using materials that would not contaminate the growth solution. This is so that unwanted crystal growth does not occur and impurities do not develop upon the crystal itself due to other ions in solution. Seed crystals were grown using homogeneous nucleation to provide a surface for heterogeneous nucleation to occur in the growth solution. Using seed crystals, high quality potassium dihydrogen phosphate (KDP) crystals were grown without unwanted homogeneous nucleation inside the chamber. The chamber will be used to grow dye inclusion crystals in order to study the interactions between certain organic dyes and inorganic crystals. ■

COMPUTER SCIENCE

The Application of Swivel to Remote Photography

Presenter: Dillon Lisk
Faculty Advisor: G. Jan Wilms

This research project is an attempt to adapt the Swivel camera base for remote still-shot capture, to be used in such instances as recitals, graduations, etc., where the ideal location from which to take pictures is inconvenient to stand in. This project first required researching the Swivel's capabilities, with cooperation from the device's creators, in order to determine whether this task could be accomplished without modifying the physical device. Then, after determining that no modifications were necessary, a study of Objective-C, the language Apple apps are written in, was undertaken and the libraries needed to communicate with the Swivel were provided by its creators. The end result of the project is a client/server app for iPhone and/or iPad that will allow a local device to remotely pan another device on the Swivel, receive a live video feed from the remote device's camera, and command the remote device to take and save still-shots.

ITCM Data Management System

Presenter: Luke Ferguson
Faculty Advisor: James Kirk

In the past, Union's ITCM used a whiteboard and spreadsheet to keep an inventory of its items. This project involved changing their system completely by creating a database for the day-to-day use by the department. This database is hosted on the university's server, and it tracks the daily checkouts and the classroom inventory in every building on all campuses. A page was also developed where equipment can be requested for rental (for use by teachers and organizations). This will be checked daily so that the student worker can update the calendar with the given information. There are different security levels to the database. The full-time employees are the only ones that can make changes to the database (using the back-end). They are also able to use the barcode scanner app. Student workers will be able to use the checkout portion of the database (using the front-end). In short, this project is intended to help improve inventory tracking and control for ITCM.

Never Hit Another Red Light Again

Presenter: Nathan Webb
Faculty Advisor: G. Jan Wilms

This research utilizes the capabilities of the iOS Core Location framework, and its functionality in vehicular timing and transportation. The proof-of-concept app queries the iPhone's positioning modules to obtain the driver's speed, location, and current direction, in order to apply tests against a database of local stoplights and speed limits. It informs the driver of the current state of the approaching stoplight and recommends a speed range in an intuitive manner that will allow them to pass through it without needing to stop.

Dawson's Dream

Presenter: Jamie Fox
Faculty Advisor: G. Jan Wilms

Dawson's Dream is a mathematical game app for mobile devices. Dawson's Dream puzzle consists of bins that contain numeric tokens. The object of the puzzle is to strategically manipulate the tokens in the bins to the point that a 1 is in each bin. This goal is accomplished by performing a combination of three different types of moves. Dawson's Dream was created in Flash, due to the power of its animation capabilities and user-friendly interface. Also, Flash has the capability of running on iOS and Android so the vast majority of mobile device owners can engage in and enjoy Dawson's Dream.

Using Parallel Programming to Solve Complex Problems

Presenters: Jordan Haskins and Evan Barnett
Faculty Advisor: James Kirk

Interest in parallel programming has recently grown due to demands for faster processing and several challenges in computer architecture. These issues include the predicted end of Moore's Law and the "power wall," which restricts the scaling of CPU frequencies. For decades, supercomputers have used multiple processors, and even single-core CPUs have used pipelining and other techniques to improve instruction level parallelism. The trend toward increasing parallelism in personal computers has led to today's multi-core processors. In 2007, NVIDIA introduced a new approach that uses the graphics processing unit (GPU), which consists of thousands of smaller cores designed for parallel performance. Parallel processing is a faster alternative to serial processing. In this project, we use NVIDIA's CUDA parallel computing platform to demonstrate the advantage of using GPU parallelism in tackling several computationally complex problems. ■

DIGITAL MEDIA STUDIES

The Superlative Spectrum of Motion Graphics

Presenter: Abigail Addison
Faculty Advisor: Melinda Posey

Motion graphics covers a broad spectrum, and is not something that can be learned holistically at once; it can be done a plethora of different ways, and still be under the same umbrella. Motion graphics can be used to convey information, make a persuasive argument, introduce an idea, et cetera. Through this project, two opposite sides of the field, both in content and construction, have been explored. One video is more of a personal project with resume-related content, using hand-done processes and more traditional stop-motion techniques edited in Final Cut Pro. The second is an animated infographic using an entirely digitized process through After Effects, accompanied by a traditional stationary infographic. The statistic content supplied is from the International Mission Board, and the items produced have been created for use on their East Asia website. Although the reason and method by which each of these two separate videos have been constructed are different, they are still presented with the label of motion graphics with the intent to inform and entertain.

The New Standard of Responsive Design

Presenter: Claire Bassford
Faculty Advisor: Cam Tracy

Being a part of the Digital Media field is a constant learning and adaptation process. As trends are continually changing and moving forward, new standards are being added to the long list of must-have web criteria. One new standard, responsive design, allows any website to be resized and reformatted to be viewed on a variety of devices. This new trend is quickly becoming the new normal and should no longer be considered an option, but rather a necessity. This project takes an in-depth look at three responsive design grids and the various ways innovative developers are utilizing responsive design to deliver sites to desktops, laptops, tablets, and mobile devices.

Moving Into the Future with Common Core

Presenter: Mason Freeman
Faculty Advisor: Melinda Posey

Common Core is the buzzword for educators around the United States. Most schools are implementing a standard of learning for each grade level. This standard can help students regardless of the social class or where they live. Each student will receive the same general principles as someone who is in a different school system nationwide. The Kindergarten educators of Deer Valley Elementary School in Birmingham, Alabama want an app for their devices that can help teach a single Common Core Standard which also appeals to Kindergarten Students. The interactive app produced for

this project uses a variety of digital media tools such as Xcode and Adobe Illustrator to present a story to kindergarteners via an iOS iPad device. At the end of the story there are comprehensive questions built into the app to help the student better understand the characters, the theme, and the plot of the story.

Empowering Non-Profits to Engage their Communities through Social Media

Presenter: Katie Cooper
Faculty Advisor: Jim Veneman

In a technology driven society it is important to utilize new ways to communicate to target audiences. Social media has become a popular way for organizations to communicate with their audiences and reach people they otherwise would not. It is important for organizations to have a social media plan because it could quickly evolve into a crisis or waste of time if not utilized properly. The social documentary class at Union University worked together in creating a multimedia DVD package for the Regional Inter-Faith Association, or RIFA, a Christian nonprofit organization that feeds, clothes, and trains people for a better future. Multimedia content was gathered in each of the departments at RIFA and incorporated into the DVD. This project involved creating a social media marketing strategy for RIFA involving a plan on how to use social media on a day-to-day basis in order to boost awareness and attract people in the community to help. The plan also covers when the best times would be to push out the multimedia content onto different social media platforms. The goal is to connect RIFA to the community in building relationships they otherwise they would not through social media.

DIGITAL MEDIA STUDIES

Crafting a Church Communication Plan on a Budget

Presenter: Jeff Thompson
Faculty Advisor: Cam Tracy

Church communication can be challenging. In a world cluttered with thousands of messages trying to gain the public's attention, the church can get lost in the mix. Having a plan for internal and external communication is a must. Understanding what resources are available with little or no cost can help a small church make a big impact to reach its audiences. In the context of Agape Christian Fellowship Church, this project helps define the internal and external communication plan in a way that is simple and easily updateable. This campaign uses print, web, social media, and video to reinforce Agape's mission to share the gospel to the city of Jackson.

Parallax Scrolling: A Unique Web Experience

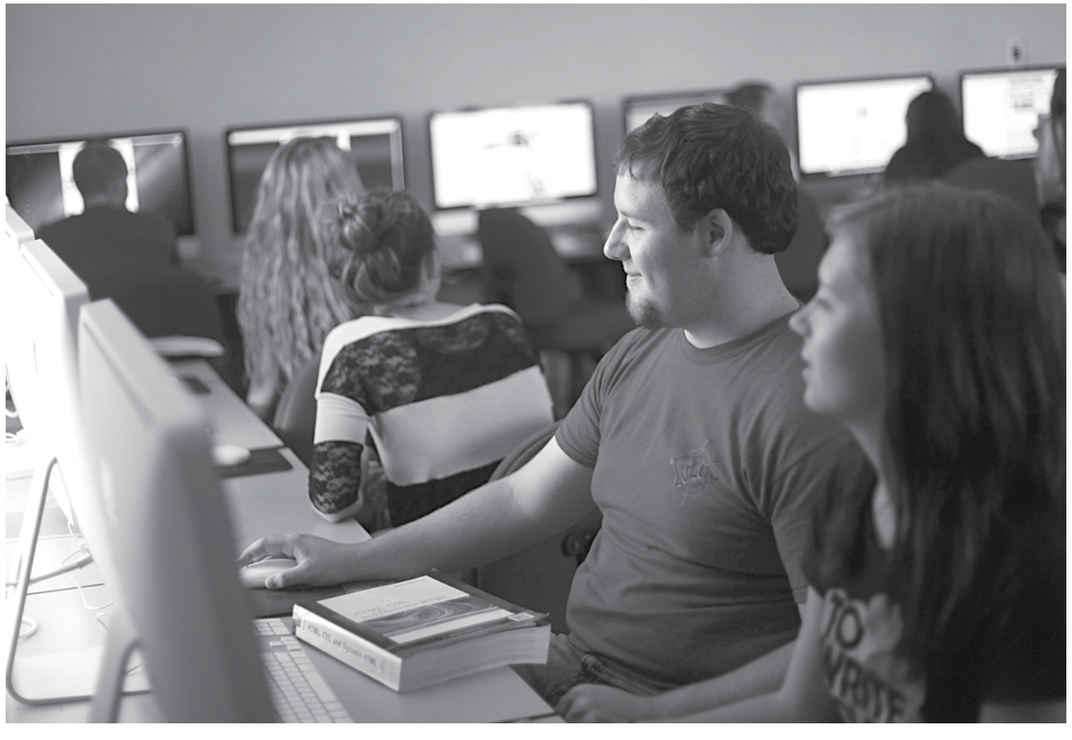
Presenter: Michael Cole
Faculty Advisor: Cam Tracy

Parallax scrolling is a creative and imaginative process that presents an animated scene in an interesting way. Originally this tool was used by Disney to create animated scenes using several layers stacked together to create depth and combined animations, and it later found its way into 2D video games such as Sonic. On the web this process began slowly but has picked up with advancements in Javascript. This project will demonstrate parallax scrolling through the creation of a portfolio site.

Motion Graphics and Modern Design

Presenter: Matthew Cole
Faculty Advisor: Chris Blair

Motion Graphics is a field of convergence in the communication field. It merges graphic design, videography, and 3D modeling to produce kinetic visually appealing productions. This project involved investigating all the different aspects of motion graphics, the industry tools, and the processes used. To investigate motion graphics, a variety of projects were embarked upon to reveal the inner workings of motion graphics. These works will be showcased in a website which will serve as a portfolio along with a blog which discusses the ventures and history of motion graphics. ■



EDUCATION

An Analysis of Chinese High School Students' Attitudes Toward Persons with Disabilities

Presenter: Zhang Yu
Faculty Advisor: Randall Phillips

Chinese culture has maintained at best a mixed response toward disabilities dating back from the era when Confucius ideology ruled the society. The invisibility of disabilities in Chinese society reflects a pervasive avoidance. This study examined attitudes of Chinese high school-aged students toward persons with disabilities. The Attitude Toward Disabled Persons (ATDP) Scale was translated into Chinese and used for this study. Descriptive analysis revealed that a substantial percentage of participating students have positive attitudes toward people with disabilities. While ANOVA revealed there was no significant difference in attitudes toward persons with disabilities between students with and without disabilities, gender was found significant with respect to attitudes toward persons with disabilities; specifically, male students have more positive attitudes toward persons with disabilities than female students. Respondents with and without disabilities varied substantially regarding how society should treat persons with disabilities. These differences indicate a strong need for accommodation, understanding, and attention felt by those with disabilities. Implications of the findings for education and further study are discussed.

Pharmacist to Public Education Philanthropist: The Legacies of E.W. Grove

Presenter: David W. Webb
Faculty Advisor: Dianne Morgan

This research study provides a historical analysis of the impact of Edwin Wiley Grove from his beginnings as a small-town pharmacist to a multimillionaire entrepreneur and education philanthropist. This study assessed the impact of Grove's business enterprises on the pharmaceutical industry and real estate development in the southeastern United States. The study also sought to ascertain his motivation to pursue financial success and philanthropic activities, including the establishment of a public high school. Furthermore, the study examined why Grove did not receive the same kind of attention in history as his peers, such as Andrew Carnegie, John D. Rockefeller, and Milton Hershey, who had done similar philanthropic activities. Additionally, the study sought to determine what education administrators can learn from E. W. Grove's life and his school. Grove's legacies as a result of building projects in Asheville, North Carolina, and charitable giving in Paris, Tennessee, continue to have a lasting impact on those cities. His longest lasting and most significant legacy was the creation and continued support of E. W. Grove-Henry County High School, one of the nation's first privately endowed public secondary education institutions. Grove established and endowed the school to meet an educational need in his former hometown. Through his vision and financial support, he enabled educational leaders to create a model school with a continuing reputation for academic excellence.

Demographic and Organizational Variables as Predicators of Teacher Attrition

Presenter: Leah Rice Watkins
Faculty Advisor: Terry Weaver

The purpose of this study was to examine the predictive capacity of specific demographic and organizational variables upon teacher attrition. By identifying teachers most likely to attrit, administrators can intensify support to those teachers to increase their likelihood to remain in education. This study sought to answer the following research questions: (1) To what extent do various demographic variables predict teacher attrition? (2) To what extent do organizational variables predict teacher attrition? (3) What patterns become observable with regard to demographic and organizational variables and teacher attrition? Due to the limited numbers confirming intent to attrit, statistical analysis in the form of logistic regression could not be used to analyze the results. Therefore, two of the three research questions were not able to be statistically analyzed. Descriptive statistics and a discussion of the findings were used to report the findings of the survey. ■

ENGINEERING

A Study in Sound Reduction Techniques

Presenters: James Avery, Phillip Johnson, Ryan Substad
Faculty Advisor: Don Van

Considering aesthetics is a vital part of engineering a marketable product. Many times, this term refers to the visual aspect of design. Yet for many machines used today, sound levels are a major issue for both safety and comfort. Our team was challenged with reducing the sound levels of a Porter Cable Pancake Air Compressor. Our presentation will discuss general acoustic theory regarding waves and interference and common sound reduction techniques. We will also examine products such as barriers, absorbents, and mufflers along with problems that arise as a result of these modifications.

Experimenting With a Coal-Powered Rocket Mass Heater for the North African School System

Presenters: Jon Vunk, Zachary Wadley, Joshua Guthrie, Andrew Tan, William Duncan, Cody Giles, Eric Ramirez, Shane Caver, Taylor Mayo, Lydia DeWolf, Matthew Bentley, and Chris Love
Faculty Advisor: Georg Pingen

This project's main goal is to modify a wood-burning Rocket Mass Heater designed by Ianto Evans from his book, "Rocket Mass Heaters: Superefficient Woodstoves YOU Can Build," for North African school systems. A rocket mass heater is a high-efficiency wood-burning stove that uses exhaust to heat a thermal mass. A coal-powered rocket mass heater is needed because the North African government supplies an allotted amount of coal to the schools. The current device used for burning the coal is a small in-class stove. It is inefficient and unsafe because burning the coal fills the room with poisonous smoke. To vent the smoke, the teachers open up the windows, letting any produced heat escape. The coal and heaters are not often used because of these issues and students often stay at home on cold days. The last team from Union that traveled to North Africa during March 2012 helped install a rocket mass heater designed to efficiently burn wood. Our class's job is to continue modifying the design to develop coal-burning capabilities. This process starts with innovative design, testing and implementation. Our efforts toward this project will greatly help the North African school systems in the future.

Brightening the Future with LED Technology

Presenters: Dylan Baker, Todd Jones, and Kian Jost
Faculty Advisor: Jay Bernheisel

With a growing concern for energy efficiency, LED (Light-Emitting Diode) technology has emerged as a popular alternative to traditional incandescent and fluorescent lighting methods in the home lighting industry. Since this technology is continuing to develop, there are still obstacles remaining to be overcome. One of the most significant is the strong directional nature of the light that is emitted. This project seeks to determine, from a representative set of options, a configuration of LEDs in which the light is dispersed in a more consistent manner while still maintaining the energy efficiency that has become the staple of this technology.

Transmission Line Simulation

Presenters: Rachel Carbonell and Ky Bailey
Faculty Advisor: Randal Schwindt

The general transmission line model can be very useful for analyzing a variety of systems involving a source and load. This model was utilized to learn about systems that guide electromagnetic signals. The purpose of this project was to create a MATLAB program that, given a specific transmission line's characteristics, will calculate other characteristics, as well as display important voltage information as an animated graph. This program can be used to quickly analyze a transmission line system, as well as be used as a teaching tool to learn to interpret the results of such analysis.

Engineering Capstone Project for ABB, Inc.

Presenters: Rachel Carbonell, Jonathan Gwaltney, Joel Ingram, and Caroline McConnell
Faculty Advisor: Don Van

ABB is an international company that works to design innovative solutions to a wide variety of power and automotive needs. The location in Alamo, TN specifically, designs and manufactures products for power transmission. The transformer, a central device involved in power transmission, is used to change the voltage level of electricity as it is sent through the power grid. Many electrical transformers are filled with oil to prevent dangerous arcing during normal operation. Environmental and operational factors can affect the pressure of the oil inside of the transformer. These pressure changes can impact the operation and safety of a transformer; thus it is important to be able to

sense such changes in pressure while a transformer is running. The group worked in cooperation with engineers at ABB, Inc. to address this need in a creative way that fits with the company's innovative and service-oriented philosophy.

Impedance Matching

Presenters: Jon Vunk and Zachary Wadley
Faculty Advisor: Randal Schwindt

The goal of this project was to create an interactive MATLAB program that calculates impedance matching networks for several typologies. The program prompts the user to input information for the given line parameters as well as choose the typology they are trying to match. The output line parameters are then displayed.

Automated Pellet Mixing System (X5)

Presenters: Ky Bailey, Tom Drury, Rebecca Sharpe, and Jon Vunk
Faculty Advisor: Don Van

General Cable is a manufacturing company that produces many different types of cable. Our project involves General Cable's Jackson, TN plant which is part of their Datacom business. At the plant they make category 5 and category 6 (Plenum and Riser) Ethernet cable. Some of the inside wires of these cables are marked with a thin color strip that is placed on insulation of the wire. The color strip is produced by melting a mixture of color pellets and compound pellets through the use of extrusion machines. The main extruder outputs a thin plastic jacket on the wire while the co-extruder places the color strip on the insulation. The purpose of our project is to minimize the amount of cable scrap produced during the process. This newly created automated pellet mixing system (X5) effectively minimizes the cable scrap through automating a controlled pellet ratio to the co-extruder.

The Design of the Theremin – A No-touch Instrument

Presenters: Shane Caver, Eric Ramirez, Andrew Tan, and Will Duncan
Faculty Advisor: Jeannette Russ

For this project, we will investigate a musical instrument known as a theremin, invented by Leon Theremin in 1928. This instrument is unusual in that it is played without physical contact; hand motion of the player toward or away from antennae control the pitch and the volume of the note played. For our project, we will look at the internal circuitry of the theremin and attempt to explain how and why the instrument works the way it does. In addition, we will search for ways to improve the instrument, such as designing a system where multiple pitches may be played simultaneously.

The Smith Chart

Presenters: Brady Sheppard and Zac Baker
Faculty Advisor: Randal Schwindt

The Smith Chart, developed by P.H. Smith in 1939, is a graphical tool that was developed for analyzing and designing transmission-line circuits. The Smith Chart is formed by plotting the unit circle on the real-imaginary plane and then plotting several other circles and arcs within. The Smith Chart helps to avoid many tedious calculations of complex numbers, and also allows an engineer to design impedance-matching circuits. The Smith Chart can also be used to represent many parameters such as impedances, admittances, and reflection coefficients. This group will show how to use the Smith chart and show how it can be used to design impedance-matching networks for several given problems.

Matlab Modeling of Transmission Line Characteristics

Presenters: Grace Morriss and Matt Wilson
Faculty Advisor: Randal Schwindt

This project addressed the need to create a MATLAB program that, given load impedance and transmission line characteristic impedance, calculates and displays the voltage reflection coefficient, the voltage standing wave ratio, and the first voltage minimum and maximum for a transmission line. The program also produces a plot of $|V(z)|$ and an animated plot of $v(z, t)$. All of these values are how voltage and current travelling on a transmission line (such as a co-axial cable) are modeled. Modeling these waves is important in both electromagnetics and power engineering. As a result of the calculations in this program, using simple line characteristics, a time and space model of voltage is produced.

ENGINEERING

Things You Didn't Know Your Gaming Device Could Do

Presenter: Alex Charles
Faculty Advisor: Jeannette Russ

Microsoft's Xbox Kinect was groundbreaking in bringing computer vision out of the labs and fringe markets to the mainstream consumer market. Nvidia has done the same for parallel computing with its CUDA line of graphics cards. The gaming industry has fought its way out of the sidelines and has now evolved into a multi-billion dollar industry. The race to create increasingly realistic graphics has shifted the way engineers look at processing, while the push to create a more immersive gaming experience has led to a number of innovations in the way humans interact with computers and vice versa. In an attempt to widen its customer base, the gaming industry has worked hard to make these advanced technologies both available and affordable. This presentation will demonstrate how Nintendo's Wii remote can be used to convert a regular projector screen into a smart board with multi-touch capabilities and how this modification can be used to bring first-world classroom technology to the developing world. The presentation will then demonstrate how the Kinect "reads" people and distances and how different industries are using this concept to make further advancements in their respective fields.

C.O.W.S: Controlled Off-Grid Watering System

Presenters: Matt Wilson, Wilson Holland, Brady Sheppard, and Scott Kahler
Faculty Advisor: Don Van

The purpose of this project was to implement a design that incorporates the skills gained throughout our academic careers to work in concordance with a current stream restoration project. The group will provide financial analysis and detailed schematics to help the landowner make an informed decision on design implementation. The end goal is to provide an off-grid, lost cost system that is able to provide the landowner's livestock with water in a manner that requires minimal human interaction and maintenance. This project will also function to allow the West Tennessee River Basin Authority to complete their current stream restoration project without disrupting the lifestyle of the domestic livestock.

Impedance Matching Using MATLAB

Presenters: Alex Charles and Rebecca Sharpe
Faculty Advisor: Randal Schwindt

The ultimate goal of impedance matching is to minimize the reflection coefficient, $\circ$, between a known source output impedance and an arbitrary load impedance connected by a transmission line of a known characteristic impedance. Through this process, maximum power transfer from the source to the load is achieved. If the impedances are not matched, some of the power is reflected back toward the source and is effectively lost. For high frequencies, an impedance matching network is used. The objective of our project is to simulate five common matching networks and plot the corresponding $|\circ(\circ)|$ versus $\circ$ representation using MATLAB. This plot shows the relationship between the reflection coefficient and the frequency. Depending if the load impedance is complex or purely resistive will help determine which matching network is best to use.

A Miniature Steam Engine

Presenters: Alex Wainscott, Cody Giles, Taylor Mayo, and William Murray
Faculty Advisor: Jay Bernheisel

Steam engines were first invented by Thomas Newcomen and James Watt in 1705 and were the first type of engines to see widespread use. Steam engines were used to power a vast array of machinery ranging from locomotives to factories and many other uses during the industrial revolution. A steam engine works by inputting steam which pushes a piston and in turn causes mechanical work to be done. The high pressure input is caused by the boiler, which heats up water in order to make steam. This project will focus on building a steam engine, measuring the efficiency, and then optimizing our design by changing variables such as the flywheel size or the piston size. For the bulk of our project we plan to run experiments by changing variables that will hopefully provide an ideal design and produce the maximum efficiency.

Gutter Pelton Wheel Battery Charger Abstract

Presenters: Matthew Bentley, Lydia DeWolf, Joshua Guthrie, and Chris Love
Faculty Advisor: Jeannette Russ

Rain water collected on residential roofs is a natural and renewable power source that is largely unused in the modern world. Many parts of the world experience incredible amounts of rainfall per year, and this power could be used to provide a higher standard of living to many of the poorest people in the world. With simple innovation and technology that is centuries old, rain power could be harnessed to power simple devices that could be useful in today's society and throughout the world. Pelton wheels have been used throughout history

to provide a simple means of collecting energy from moving channels of water such as rivers and streams. Using the same principles that exist in this simple setup, this team will examine how rain runoff from roofs could be harnessed to create energy. Attaching a Pelton wheel to a gutter system on a residential home or business could provide a small amount of power with very little cost to the home or business owner. The team will examine the ability of roof runoff to produce enough extractable energy to be useful. Specific usage ideas include powering a small light, charging batteries, or other simple applications that could prove beneficial in the developing world or in natural disaster situations.

Answering the Call of Developing Countries

Presenters: David Adams, Shiva Hemmatian, Taylor Mayo, and Alex Wainscott
Faculty Advisor: Jeannette Russ

One of the themes impressed upon engineering students at Union is the importance of using the knowledge and skills gained in school to improve the quality of life for people in various settings around the world. In some climates, such as Africa, the nighttime temperature can reach extremely low temperatures. Considering this need, we began to explore ways to design a blanket that can be heated through the circuit elements we have learned about this semester. This idea could be used to provide comfort or even survival to those in need. Although nothing is to be constructed, this project serves as an approach to discussing possible designs, options for power supply, cost effectiveness, and improvements that could be made to the designs. Our goal is to come up with a practical and effective idea that would benefit those in need through the use of circuit elements. ■

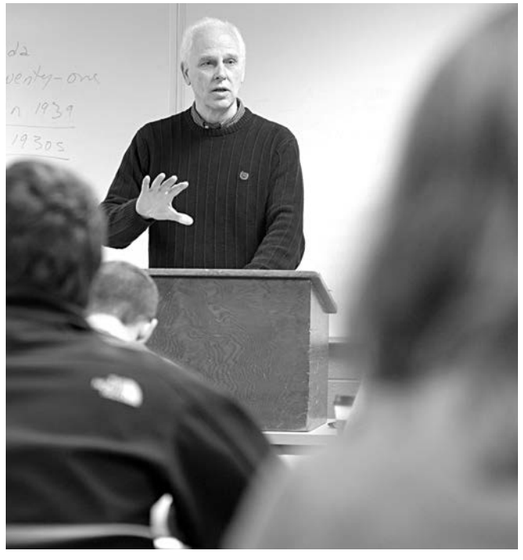
ENGLISH

"The Death of Herod": A Reader's Theater Presentation Of The Medieval Play From The *Ludus Coventriae* Mystery Cycle

Presenters: Zena Chmielewski, Chelsea Cothran, Rebecca Edgren, Becca Farrell, Jessica Ferrell, Kurtis Gallop, Kalee Hall, Taylor Hare, Josiah Hubin, Jonathan Kerr, Laura Little, Mary Beth Massey, Megan Pinckard, and DeShuni Sanders
Faculty Advisor: Gavin Richardson

This will be a "reader's theater" presentation of the "The Death of Herod" from the medieval *Ludus Coventriae* Mystery Cycle, ca. 1450 in East Anglia. Students will read the play in Middle English. The star of the show is the language, but students will do some light performing of roles such as Herod, Mary, Joseph, Angels, Soldiers, and, of course, Death. Running time is approximately 25-30 minutes. ■

HISTORY



The Weapon of Dress: Identity, Acculturation, and the Transition of Cherokee Clothing, 1794-1838

Presenter: Patricia Dawson
Faculty Advisor: Keith Bates

As American influence on the Cherokees increased in the years leading up to the Removal, an important transition in Cherokee clothing occurred. Many Cherokees believed that acculturation was imperative to the survival of the Cherokees as a nation and as a people, but others believed that acculturation compromised identity. As national and personal identity became increasingly threatened, great tensions divided the nation. In defense of their national identity, the Cherokees developed clothing styles that satisfied Euro-Americans and their concept of civilization, while simultaneously creating something distinctly Cherokee that sustained the concrete and symbolic identity of the people. The Cherokee adoption of certain Euro-American aspects of clothing was not mere assimilation, nor were the unique aspects of Cherokee dress mere anomalies. Cherokee clothing, with all its accompanying tensions and complexity, served as a carefully chosen weapon for the survival of identity. ■

MUSIC

Schlafendes Jesuskind (Sleeping Christ-child): 19th Century Lieder by Hugo Wolf

Presenter: Madelyn Carson
Faculty Advisor: Joshua Veltman

This research project presents a piece by Austrian composer Hugo Wolf, *Schlafendes Jesuskind*. Lieder, or short art songs composed for piano and voice in German has become a popular performance genre for many singers. Hugo Wolf is known for his extensive work with Lieder as well as his intense expressiveness stemming from a highly volatile life filled with fluctuating emotion. *Schlafendes Jesuskind* falls neatly into this genre but like most of Wolf's work, it does not take its place neatly and quietly. Even though its story is contemplative, *Schlafendes Jesuskind* represents a clear example of Wolf's ability to package his intensity in a small and restrained package. Its hymn-like style presents a picture of serenity without forgoing the unpredictable expressiveness known to Wolf. This research means to present the work in context of the composer and the time period to display its place and uniqueness to the genre.

Impressionism: Music as the Medium

Presenter: William Burke
Faculty Advisor: Joshua Veltman

This presentation will deal with Claude Debussy and his composition for Voice and piano entitled "Beau Soir." The overall importance of this piece as it relates to the development of the voice, the intrinsic beauty of the composition, the historical context behind the piece, and the influence the text has on the composition will be discussed. Comparisons and contrasts between "Beau Soir" and other compositions of the time period will be made. Debussy's life and how certain events may be significant in the process of writing this particular piece will also be discussed.

Egmont Overture Op. 84: Incidental music by Ludwig van Beethoven

Presenter: Blake Giles
Faculty Advisor: Joshua Veltman

My research project is about a piece called, Egmont Overture Op. 84, by a transitional composer from the Late Classical to Early Romantic Eras known as Ludwig van Beethoven. It is one of the incidental music that is part of a set of incidental music that Beethoven composed between October 1809 and June 1810 for the play, Egmont. Beethoven is known for his vast amount of musical compositions. For example, he wrote nine symphonies, eight overtures including the Egmont Overture and many more compositional pieces. The play, Egmont, was written by a transitional playwright from the Mid Classical to the Early Romantic Eras known as Johann Wolfgang von Goethe. Goethe is known for writing many literature works during his time like plays, especially his play, Egmont, and poems. The play, Egmont, is about a hero named Lamoral, Count of Egmont who helps the Low Countries rebel against the Spaniards by fighting to the death before being led to his execution. ■

INTERCULTURAL STUDIES

Child Brides: Conquering Contradictions

Presenter: Purity Ogolla
Faculty Advisor: Cynthia Jane

The practice of child marriage is found in many parts of the world, but is more common in Africa, the Middle East, and South East Asia. The United Nations Children's Fund declared in 2001 that marriage under the age of 18 was a violation of Human Rights (IPPF, 2006). Today, it is estimated that within the next decade 100 million girls in the developing world will marry before their 18th birthday (ICRW, 2007). Many researchers have documented motherhood, premature pregnancy, and greater vulnerability to domestic violence as inevitable consequences of child marriage (UNICEF, 2005: World Vision, 2008). To deal with the problem, the United Nations and other international organizations have recommended a number of strategies (ICRW, 2012). However, ending the practice has proven to be a challenge. The aim of this research is to discuss the current issue of child marriages across cultures and predict on how non-government organizations can strengthen their roles as international organizations dealing with the practice of child marriages. Three theories will be used as model solutions to address the problem.

Afro-Latino Identity in the Caribbean: The Importance of Educating Blacks on their History, Art, and Culture

Presenter: Tenneisha Lowe
Faculty Advisor: Cynthia Jayne

The goal of this research is to explore the identity formation of Afro-Latinos within the Hispanic Caribbean. According to George Andrews, Blacks counts for 22 percent of the Latin American population. Blacks have been culturally impacting the Spanish-speaking Caribbean for over a half millennium. Despite the obvious numerical representations and influences of Afro-Latinos, many have chosen to abandon their ethnic origins by rejecting their African roots. The results are obvious in the way individuals have refused to educate others on their multiethnic background (physically Black yet, culturally Latino). Thus, this research explores several factors that contribute to Afro-Latinos choosing to identify with or reject their ethnic heritage.

America's Favoritism: Responding to Disaster

Presenter: Rachel Harkins
Faculty Advisor: Cynthia Jayne

Natural disasters occur every year, leaving much devastation in their wake. The response of the United States in such crisis situations is the focal point of this project. Three disasters in current history are drawn upon as examples: Hurricane Katrina (2005), the Asian tsunami (2004), and the Haitian earthquake (2010). This research seeks to examine and compare the response of the West, particularly the United States, to these disasters. Temporary and long term shelter needs are the focal point of the analysis which evaluates how well Western organizations were able to meet those needs in accordance with the international standards such as the UN Humanitarian Charter and Sphere guidelines.

Changing the Conversation: A Look at International Humanitarian Engineering Work

Presenter: Leandra Hosfield
Faculty Advisor: Cynthia Jayne

"Changing the Conversation" is an exploration of the complex challenges that emerge when engineering work takes place in the international humanitarian realm in an attempt to explore the shortcomings of the work and thoughtfully consider how projects can be improved. Specifically, focus is placed on the challenges that currently exist in project logistics, education, and ethics. Through exploration of the issues, a common attitude held by many involved in humanitarian engineering projects was uncovered that serves as a major barrier to work being done. Through presentation of research, it will be made clear that current approaches and attitudes toward humanitarian engineering are reminiscent of Edward Said's Orientalism and stand as a hindrance to the positive growth and development of this emerging sector of work.

Reconciliation: An Analysis of Post-Conflict Responses

Presenter: Louisa Saratora
Faculty Advisor: Cynthia Jayne

State-sponsored reconciliation efforts are essential to creating social and political structures and implementing policies that foster and sustain community healing, but cannot and do not fully address personal paths to reconciliation. Conversely, personal reconciliation efforts do not have the power to affect widespread attitudes and actions. This research project focuses on an analysis of what is meant by reconciliation in post-conflict societies and how state-sponsored processes both further and complicate peace building. An interdisciplinary literature review of criminal tribunals and truth commissions conducted through theological and cultural lenses illustrates the effectiveness of both in reaching stated goals of justice and reconciliation, as well as where each falls short. Consideration of how intercultural factors such as religion and culture impact the structure, process, and reception of reconciliation efforts by participants and observers forms the center of this research.

The Writing Challenge for Saudi Arabian Students in Western Universities

Presenter: Brandy Hudson
Faculty Advisor: Cynthia Jayne

My research examines some of the academic and sociocultural challenges that Saudi Arabian students face when entering an academic community in a foreign culture with a high emphasis on writing and literacy. This is in contrast to their educational background, which is more rote and places less emphasis on the written word than we see in Western culture. I want to explore the possible contributing factors to the cultural challenges of mastering the writing process in English and examine possible options to enhance their successful adaptation to academic life in Western university environments. I would like to draw from research in the disciplines of psychology, sociology, history, linguistics, education, and politics. I will utilize a primarily text-based research methodology, while also pulling data from peer-reviewed journal articles. I hope to use these findings to explore new solutions to provide Saudi students with a more successful transition to academic life in Western universities.

Yearning to Breathe Free

Presenter: Stephanie Smith
Faculty Advisor: Cynthia Jayne

Over the past half century, thousands of people have applied for refugee status and asylum in the United States. Among these floods of refugees, certain individuals were denied refugee status, while others, entering under very similar circumstances, were admitted. This research addresses the question of the circumstances surrounding the United States' decisions to grant asylum privileges to particular groups while denying asylum to others. More specifically, it looks at certain clashes of ideology between the U.S. and the cultures of the people applying for asylum and examines the role that differences in ideology have played in determining refugee admittance.

Maintaining a Status Quo of Racial Inequality: An Interdisciplinary Analysis of America's Education System

Presenter: Holly Jay
Faculty Advisor: Cynthia Jayne

Education is often touted as the "great equalizer" which gives all students a shot at success in life regardless of their backgrounds. Racial inequality, however, continues to permeate this system as seen in the "achievement gap" between different groups. In many ways, rather than improving the status quo, the education system actually exacerbates existing inequities because as a system its institutional policies stem out of the particular cultural values and beliefs of the majority population. This paper looks at how education policies may play a role in the maintenance of group inequalities, specifically focusing on language policy, ability grouping, and standardized testing. An interdisciplinary framework rooted in educational policy and theory, sociology, linguistics, and cultural theory contributes to an integrative understanding of how popular cultural values relate to the perpetuation of racial inequality in the education system.

"Good" Schools and "Good" Churches: The White Evangelical Blind Spot on Race in Jackson, Tenn.

Presenter: Tyler Glodjo
Faculty Advisor: Cynthia Jayne

While conversation about racial reconciliation has become commonplace in recent years among area churches, Jackson's white Christian community continues to thrive from systems designed to maintain racial and socioeconomic segregation. This is particularly evident in the racial disparities between Madison County's public and private school systems, where African-Americans comprise nearly 70% of the public school population and 5% or less of the private schools. This research draws from the fields of sociology, history, theology, and law to engage racial reconciliation dialogue from an interdisciplinary perspective that acknowledges the gap between white evangelical orthodoxy and orthopraxy with regard to race relations. While the formation of multiethnic congregations is a biblical endeavor, Jackson's white evangelicals must seek for it by repenting of their historical role in creating "segregation academies" and by confronting present systems of racial division outside of the church. ■

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Using the IRR Process to Improve Patient Care Delivery

Presenters: Rhonda Oldham and Debi Sampsel
Faculty Advisor: Cynthia Powers

Many nurses understand the importance of providing evidence based interventions. It can be difficult to know how to perform a literature search and even harder to analyze the available data. An Integrative Research Review (IRR) is a research method that allows a researcher to identify the available research, analyze the data, and critique the information. The IRR is an appropriate research tool that is unfamiliar to many health care professionals including nurses. This study provides a simple, step-by-step process to completing an IRR. It includes helpful tips for research, data collection, statistical analysis and evaluation. The authors of this study utilized the IRR process to identify and analyze data to improve patient care delivery. The IRR process provides knowledge necessary to ensure research is implemented at the bedside and beyond.

Healthcare Simulation: A Multidisciplinary Integrative Research Review and Future Implications for Competency Assessment Among Registered Nurses

Presenter: Brian Foster
Faculty Advisor: Bradley Harrell

According to the Institute of Medicine's report *To Err is Human*, "health care is not as safe as it should be…perhaps as many as 98,000 Americans die in hospitals each year as a result of medical errors" (Institute of Medicine [IOM], 1999, p. 26). The IOM goes on to recommend sweeping changes to competency assessment, "Health professional licensing bodies should implement periodic reexaminations and relicensing of doctors, nurses, and other key providers based on both competence and knowledge of safety" (IOM, 1999, p. 134). The technique of simulation for competency assessment has been used for decades in fields such as aviation and the military. The objective of this review is to examine the methods and instruments of studies from various disciplines, other than nursing, currently using simulation to measure competency according to our functional definition (a task or group of tasks that can be measured either qualitatively or quantitatively against a known standard.

Electronic databases and relevant website repositories were utilized to obtain studies for this review. The authors accessed Medline, Psylit, Ovid, Academic Onefile, and Science Direct. Additionally, NASA.gov, NHTSA.gov, DTIC.mil, and FAA.gov were manually searched for relevant title and keywords. Inclusion criteria include articles from peer-review journals that were written or translated into English, and have been published after 1990. These studies must address the functional definition of competency as at least one measured outcome. Exclusion criteria include those studies published prior to the year 1990. Additionally, articles were excluded that used simulation for pedagogy or to strictly assess the effectiveness of training. Due to the nature of the rationale for this integrative research review, nursing simulation based competency assessment studies were also excluded. The 17 studies included in this study describe various methods of construct validity, correlation studies, descriptive statistics, and simulation methodologies for the assessment of competency. Potential implications for nursing are derived from the clinical and academic context of the authors.

A Comparison of the Upper Lip Bite Test with Modified Mallampati Classification in Predicting Difficulty in Endotracheal Intubation

Presenters: Paulina Williamson, Kellie Logue, Carrie Shuler, Jenny Williams, and Magen McCulloch
Faculty Advisors: Zoila Sanchez and Connie Cupples

Inadequate airway management is one of the most common causes of anesthesia-related deaths. Having an accurate assessment tool for predicting difficult airways enables anesthesia providers to be better prepared for preventing adverse outcomes. The purpose of this study is to compare the modified Mallampati test (MMT) and upper lip bite test (ULBT) in order to determine which is more accurate at pre-operatively identifying adult patients with a difficult airway. Google, Google scholar, OVID, CINAHL, MedlinePlus, and PubMed were searched using the terms: modified Mallampati test, upper lip bite test, airway assessment techniques, difficult intubation, direct laryngoscopy, airway classification, evidence-based practice, and comparison study. After critical appraisal of the data from five randomized controlled trials, the ULBT was found to be a better tool for predicting difficult airways than the MMT. Research also emphasized that a combination of the two tests is more effective than using either modality alone.

Comparison of International Health Care Systems: United States

Presenter: Denise Thornton Orr

According to Edwin G. Dolan, economist, textbook writer and educator, "Most Americans, even those critical of the health care system as a whole, report that they are satisfied with the care they personally receive. . ." (Dolan, Feb. 28, 2011, Blog). The DNP class of Nursing Health Policy and Economics has examined the economic and political factors affecting health care in the United States. To compare the United States Healthcare to other nations, the class will present posters for Japan, Australia, Spain, Mexico, and Canada that will include:

- Payer system
- Financing
- Reimbursement

- Provider Choice
- Challenges
- World Ranking
- Gross Domestic Product spent on Healthcare

The instructor of the class (Denise Thornton Orr) compiled a poster with the same information for the United States for comparison purposes.

Spain: An Overview of Health Care

Presenters: Rene' Stark, Beth Schultz, and Veneine Cuningkin
Faculty Advisor: Denise Thornton Orr

The health care system in Spain was ranked as one of the best in the world by the World Health Organization; 99.5% of people in Spain received health care until August of last year. In April, the Spanish government announced changes that would be implemented in August. Prior to August of 2012, anyone in the country was provided health care regardless of citizenship. Currently, people who are not citizens will only receive emergency care with the exception of pregnant women and children. Although, the health care system was rated as 7th in the world, patients needed to see a gatekeeper physician before seeing a specialist which could take as long as two months. The wait time for surgical procedures could be twice as long, some people waiting more than four months for a hip replacement. Physicians in Spain are salaried which could provide them with little to no incentive for meeting or exceeding the expectations of their patients. Patients are assigned a physician and are unable to make a change unless they relocate to a different region. In addition, a patient must have supplemental insurance in order to receive mental, dental or rehabilitative services. Regions of the country are given money based on population and demographics and the health care resources may not be the same in all places. Health care workers are opposing the cuts imposed by the government and physicians are continuing to provide care to all who seek their help.

Canada: A Glance Into a Single Payer System

Presenters: Phyllis Moore, Malinda Conrad, Karen Davis, and Tara Mabon
Faculty Advisor: Denise Thornton Orr

Ranked 30th out of 190 countries by the World Health Organization (WHO) for healthcare (WHO, 2009), Canada has a government-funded universal health insurance program which provides basic healthcare to its more than 35 million citizens. However, according to statistics from 2011, only an estimated 24 million people over the age of 12 reports having a primary care physician (Statistics Canada, 2012). Canada also has some challenges with their current system: an aging population but no long-term health plan, long wait times for healthcare services, especially surgery; difficulty navigating the system; no preventative medical services, an inability to meet the growing demands for integrated health technology; and discontent among physicians regarding reimbursement and lack of input into the public health system (Rich, P 2008). Funding for Canada's Medicare program is shared between ten provinces, three territories and Canada's federal government. Physicians are paid by the province or territory they serve (Health Canada, 2010). Basic medical care and prescriptions are covered under Medicare; however, each province determines the services to be covered outside of basic medical such as dental, ophthalmology and some prescriptions,

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and referrals are required to see a specialist (Barua, 2011). An estimated 30% of Canadian health expenditures come from private sources, both insurance and out-of-pocket payments. Ministers of Public Health allow permits for private clinics, but government officials have concerns that private clinics and hospitals may create an imbalance in the healthcare system, by favoring citizens with higher incomes and private insurance coverage (Understanding the Canada Health Act).

Health Care in Japan

Presenters: Lepaine McHenry, Dawn Henderson, Rachel Barber, and Cathy Ammerman
Faculty Advisor: Denise Thornton Orr

The World Health Organization assigns Japan's health care system ranking of 10 compared to the United State's ranking of 37. Japan has the lowest per capita health care costs among the advanced nations of the world. The foundation of medical services in Japan is the public universal health-care insurance system, *kaihoken*. Access to this system is either through the employer or local government agency. Premiums are calculated on a sliding-scale basis. The average out-of-pocket expense for a physician visit is $6.35 compared to $65 to $100 in the US. Costs are contained by fixed-fee payments for services. Technology is being explored to improve healthcare access to remote areas of the country. The Japanese health system depends upon a growing workforce and yet its population is aging and shrinking. This will be one of the challenges Japan faces in continuing to provide equitable healthcare to all its citizens.

Mexican Health Care System

Presenters: Traci Abram, Melissa LeFave, and Elizabeth Vega
Faculty Advisor: Denise Thornton Orr

As the United States transitions to universal health care, this system has become reality in Mexico as it reached its target of enrolling over 52 million people into health care coverage programs since 2004 (Kocherga, 2012). Mexico's current health care system is comprised of national Social Security, the Social Protection System in Health, and the private system (Martinez, Aguilera, & Chernichovsky, 2009). Because most insurance coverage was linked to employment, Mexico's congress created "Seguro Popular" offering coverage to those who are self-employed, work odd jobs, or can't afford insurance. According to the World Health Organization (WHO), 49% of health expenditure is financed by the Mexican government while 51% is paid for by the private sector. Though challenges still exist in health care delivery, Mexico was ranked 62 for healthcare delivery by the WHO in 2011 with hopes for continued progress in years to come (World Health Organization website, 2013).

The Australian Health Care System

Presenters: Darel Davis, Quintrisa Harden, and Charlotte Stephens
Faculty Advisor: Denise Thornton Orr

According to World Health Organization rankings, Australia is 32nd in overall health system performance. Citizens have universal healthcare coverage through a national public health insurance program (Medicare) and half of the population also purchases private health insurance (for-profit and nonprofit schemes). Medicare is funded by tax revenues/income tax and private insurance purchase is encouraged via yearly government rebates. Practitioners are reimbursed by base salary, fee-for-service, and pay-per-session arrangements that vary within the public and private sectors. Healthcare production occurs in primary/specialty care clinics as well as hospital and long-term care sectors; all with public and private options. Australia spent nine percent of Gross Domestic Product on health in 2008. Consumers freely choose providers; although primary care physicians are gatekeepers for specialty referrals. The Australian healthcare system is challenged by access and resource allocation issues, gaps among Indigenous and non-Indigenous populations, complex public/private sector navigation, and provider shortages.

Examining Postoperative Sore Throat (POST) in Patients Receiving Monitored Anesthesia Care (MAC) Using a Traditional and Nontraditional Oropharyngeal Airway

Presenter: Roxanne McMurray
Faculty Advisor: Bradley Harrell

Sore throat is a frequent complaint and complication following general anesthesia and, to the author's knowledge, has not been studied during monitored anesthesia care (MAC). The purpose of this study was to establish the incidence of postoperative sore throat (POST) under MAC/deep sedation with an oropharyngeal airway (traditional) or nasopharyngeal airway placed in the mouth (non-traditional). In this prospective observational study, 243 patients scheduled for elective ambulatory surgery and in need of an oropharyngeal airway to alleviate airway obstruction were included. Postoperative sore throat was found to be present in MAC cases. A significant relationship was found between traditional oropharyngeal airway use and the incidence of POST at $P < 0.05$. Findings from this study offer anesthesia providers increased sensitivity to the likelihood of POST in MAC and information on a novel use of a device that can improve the practice of MAC, increase patient satisfaction, and improve anesthetic outcomes.

Response Times and Sleepiness Among Fatigued CRNAs

Presenter: April Yearwood
Faculty Advisor: Bradley Harrell

Anesthesia is a demanding, high-stress profession where some Certified Registered Nurse Anesthetists (CRNAs) perform services 24-hours a day when on call without sleep. Shifts may last longer than 24-hours, depending on facility regulations. CRNA's are vigilant with the care of their patients; however, the effects of mental and physical fatigue could potentially compromise patient safety. This study sought to determine a significant relationship between length of time without sleep, a subjective report of sleepiness, and response times using a standardized psychomotor test. This small study concluded that CRNA reaction times significantly decreased when working for up to 24 hours without rest. Statistically, there was a moderate correlation between the number of hours without sleep and a decrease in mean response time ($p = .024$). This study heightens the importance of recognizing the impact of fatigue on patients receiving anesthesia care.

A Systematic Review of the Outcomes of Estrogen Therapy to Reduce Chronic UTI's in Post-menopausal Women Confined to a Formal Long-term Care Setting

Presenter: Kathy O'Connor Wray
Faculty Advisor: Melissa Swinea

The significance of this review is to provide evidence-based practice data on the efficacy of intravaginal estrogen in reducing chronic UTI prevalence in post-menopausal women. Urinary tract infection is the most frequent bacterial infection in residents of long-term–care facilities. Aging-associated physiological changes in women such as estrogen deficiency may contribute to the burden of bacteriuria; however, their relative importance is not well defined and bears further investigation. Estrogen has numerous effects on urogenital tissues and there are more than 3,000 genes regulated by estrogen. Estrogen receptors are found not only in the vagina and vulva but also in the urethra and neck of the bladder. In addition, estrogen stimulation increases the glycogen content of vaginal epithelial cells, which acts to maintain an acidic vaginal pH. Acidic vaginal pH is an important component of a woman's defense against pathogens. Some studies reported that the use of intravaginal estrogen in institutionalized women with chronic UTIs resulted in decreased frequency of both symptomatic and asymptomatic infection. Therefore, estrogen deficiency and the role of estrogen therapy in preventing urinary infection in this population require further study.

The Benefits of Therapeutic Hypothermia After Cardiac Arrest

Presenters: Brittany Harris, Jennifer Langhans, Craig Metcalf, Wendy Peavahouse, Sheila Settlemiers, and Denise Stokes
Faculty Advisors: Connie Cupples and Zoila Sanchez

Thousands of patients are resuscitated from cardiac arrest (CA) every year. After a CA, patients often are left with decreased or very limited neurological functioning as a result of decreased perfusion that occurs during resuscitation. The purpose of this review is to show the benefits of patient outcomes when hypothermia is initiated after circulation is restored. Question: Are the benefits of a patient who receives therapeutic hypothermia after cardiac arrest beneficial when compared to a patient that did not receive hypothermia after cardiac arrest? Methods: A literature review was performed using databases from PubMed, Ovid, Medline, and Google Scholar. A logical comparison was performed between patients that received the hypothermia intervention and those who did not. Conclusions and Recommendations: It is hypothesized that patients receiving therapeutic hypothermia after cardiac arrest have more favorable outcomes than those patients who do not.

Reducing the Incidence of Pertussis by Vaccinating Family Members and Caregivers

Presenters: Jonathan Gipson, Lori Holladay, Rachel Holmes, Linda Williams, and Sarah Wilson
Faculty Advisors: Connie Cupples and Zoila Sanchez

Pertussis, known as whooping cough, is an upper respiratory infection caused by the Bordetella pertussis or Bordetella parapertussis bacteria. It affects people of all ages but is most detrimental to infants, 12 months and younger. The purpose of this study was to determine if giving family members and caregivers of newborns the vaccine would be an effective preventative measure. Would there be less reported incidences of pertussis in infants if their family members and caregivers were given the vaccine? Ovid, Google Scholar, and PubMed searches were done using terms such as pertussis vaccine, whooping cough vaccine, and immunizing adults with pertussis vaccine. Findings comparing newborns of vaccinated family members to those that were not vaccinated will be used with logical comparisons. Strong evidence supports the need to

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have family members and caregivers immunized with the vaccine for the health of the infants and for cost effectiveness.

Trendy Diets: Do They Help or Hinder the Health of Your Heart?

Presenters: Leigh Ann Keel, Amy Little, Leslie Tenpenny, Patricia Fannon, and Danna Britt
Faculty Advisors: Zolia Sanchez and Connie Cupples

Cardiovascular disease is the leading cause of death in women in the United States. There are several modifiable risk factors associated with the development of cardiovascular disease, including diet. In our society, women seek quick solutions for weight loss without considering the impact that trending diets can have on their health. Our focus is a review of current diet trends and how they influence risk of cardiovascular disease. The research findings suggest that diet plays an integral role in cardiovascular health. Some diets diminish the cardiovascular risk, while others may heighten the risk. A methodical search of scholarly databases was conducted, using the key words: women, cardiovascular risk, cardiovascular disease, diet, low-fat, low-carbohydrate, Mediterranean, high-fiber.

An Integrative Review of the Efficacy of Music Therapy in Pain Control of Postoperative Patients

Presenters: Charlene Phillips, Jennifer Sanders, Ashley Talley, Shanytel Weathersby, and Anna Woodruff
Faculty Advisors: Connie Cupples and Zoila Sanchez

The purpose of this integrative review is to compare published research which evaluates the efficacy of music therapy in conjunction with pharmacological measures versus pharmacological measures alone in pain control during the postoperative period. Pain is a complex and individualized experience which is normally treated with pharmacological measures alone, often leaving postoperative patients with unsatisfactory pain relief. A thorough search of online databases for research published from 2007 to 2013 was performed. Many clinical trials and systematic review articles were assessed which evaluated the effectiveness of music therapy as a complementary therapy used in pain management. Evidence shows music therapy has been found to decrease the pain intensity level in combination with pharmacological measures and may decrease the amount of pharmaceuticals used.

What's All the Buzz About Pediatric Pain Relief With Needle Sticks?

Presenters: Elizabeth Card, Christy Egbert, Ann Jenkins, Janelle Scullark, and Crystal Simpson
Faculty Advisors: Zolia Sanchez and Connie Cupples

Pain and anxiety related to needle sticks in the pediatric population (5-19 yrs.) are well-recognized problems. The aim of this Integrated Research Review was to determine if the Buzzy® device is more effective than topical anesthetics (EMLA, amethocaine) in pain and anxiety reduction associated with needle sticks, time constraints, and costs. An extensive literature search was completed using CINAHL, Cochran Review, Medline Plus, OVID, Google Scholar and Ebsco. The following key words were used during the search: "EMLA", "EMLA cream", "amethocaine", "Buzzy", "pediatric", "pediatric pain", "anxiety", "needlesticks", "local anesthetic", and "venipuncture". Prior research has demonstrated efficacy and equivalence of Buzzy® to EMLA in relieving pain and anxiety related to needle sticks experienced by children 5-19 years old. Use of Buzzy requires less time compared to EMLA or other topical anesthetics. Research on the Buzzy® device is limited, additional research studies are needed for larger sample to provide generalization of findings.

The Efficacy of Forced-air Warming Systems Versus Passive Warming in the Prevention of Intraoperative Hypothermia

Presenters: Jonathan Bomar, Steven Garvin, Matt Milby, Lauren Siebrase, and Jeffery Tackett
Faculty Advisors: Connie Cupples and Zoila Sanchez

The purpose of this study was to identify the efficacy of forced-air warming systems to prevent intraoperative hypothermia. Hypothermia is defined as a core body temperature less than 36 degrees Celsius and frequently occurs as a result of anesthesia in patients presenting for open abdominal surgery. There are many physiological deleterious effects of hypothermia which impact patients' intraoperative management and postoperative recovery. Clinical Question: Are forced-air warming systems superior to passive warming techniques in decreasing incidence of intraoperative hypothermia? Method: A search of scholarly databases: CINAHL, Google Scholar, PubMed, and Medline were conducted using specific key words: normothermia, hypothermia, core temperature, forced-air warmer, and BairHugger. Conclusion: Forced-air warming devices significantly decrease intraoperative hypothermia over other treatments.

Environmental Tobacco Smoke Exposure (ETS) and Behavioral Problems in Children.

Presenters: Rachel McCoy, Shannon Lopez, Claire Harlow, Brittany Pastor, and Heather Malone
Faculty Advisors: Connie Cupples and Zoila Sanchez

Clinical Problem: Environmental tobacco smoke (ETS) exposure has been linked to a variety of behavioral problems in school-age children (ages 6-12). Clinical Purpose: The purpose of this research is to systematically review current literature to determine the relationship between ETS exposure and behavioral problems in school-age children. Method: The search was conducted using the following databases: CINAHL, Google Scholar, PubMed, and Medline using the following terms: environmental tobacco smoke exposure, second-hand smoke, passive smoking, and behavioral problems in children. Findings: Synthesis revealed a link between ETS and behavioral problems in school-age children. Further research is needed in this area. Hypothetical conclusions and recommendations: This research presents information that provides adequate evidence to support legislative changes to further reduce childhood exposure to ETS, and it can be used to educate all parents about the importance of minimizing children's exposure to ETS.

Incarceration's Effect on HIV Risk among African-American Males

Presenters: Tanya Cockrell, Lekeisha Lewis, Christina Maclin, Kori Swearengen, and Crystal Watson
Faculty Advisors: Connie Cupples and Zoila Sanchez

A disparate amount of African American males are incarcerated yearly in comparison to other ethnicities. Human Immunodeficiency Virus (HIV) infections also dominate in the African American community, particularly among incarcerated males. Has incarceration caused the increased prevalence of HIV in the African American male population? The purpose of this study is to determine incarceration's effect on HIV in the African American males. Among African American males, is there a greater risk of HIV infections in the incarcerated population compared to those in the general population? CINAHL, Google Scholar, OVID, and PubMed searches were conducted using terms "incarceration", "HIV", "African-American males" and "risk factors". Synthesis of the data in the literature revealed evidence that incarceration does not increase HIV risk in the African American males. This research presents evidence that can be used to guide education towards the higher risk group and implement new prevention methods.

Going Green with Anesthesia

Presenters: Ashleigh Gentles, Keith Gist, Anna Rojas, and Emily Wiltse
Faculty Advisors: Connie Cupples and Zoila Sanchez

Anesthesia providers (MD/CRNA) are allowed to perform the same anesthesia for the same cases. Research will identify which anesthesia model is cost efficient. The purpose of this review is to determine the more economical cost of anesthesia services for healthcare systems. In surgery, assuming the scope of practice is the same for each type of anesthesia would certified registered nurse anesthetists (CRNA) or anesthesiologists (MD) be more economical for the healthcare system? Ovid, PubMed and Medline were searched using the terms anesthesia provider, healthcare financial management and anesthesia cost effectiveness. Comparative data will be defined about the process and population being studied to determine which provider is more cost efficient. The outcome has not been concluded. However, we hypothesize that one provider may be more cost effective than the other.

An Integrative Review of Adjunct Dexmedetomidine with Morphine Versus Solo Use of Morphine on Postoperative Pain

Presenters: George Li, Wednesday Luzano, Kevin Madden, Misha Nizamov, and Jereme Raley
Faculty Advisors: Connie Cupples and Zoila Sanchez

The purpose of the Integrative Research Review is to determine the efficacy of intravenous dexmedetomidine as an adjunct to morphine on postoperative pain relief and quantity of opioids required by surgical patients. Clinical question: In adult patients undergoing surgery requiring postoperative pain management, how does the usage of dexmedetomidine as an adjunct with morphine compare to sole use of morphine affect pain level and amount of opioids administered in the first twenty-four hours after surgery? A comprehensive online search of published research articles with a focus on randomized control trials was conducted. Findings: Intravenous adjunct dexmedetomidine with morphine provides better postoperative pain relief and decreases the amount of opioid requirements when compared to morphine administered alone. Recommendations: Intravenous adjunct dexmedetomidine with morphine is an effective method for anesthesia providers to utilize in efforts of reducing opioid requirements and postulating satisfactory postoperative pain relief in patients undergoing major surgery.

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Indwelling Urinary Catheter Removal Reminders: Are They Effective In Reducing Catheter-Associated Urinary Tract Infections?

Presenters: Shunta Chevis, Cheryl Dodson, LaRonda Gant, Charlotte Rose, and Barbara Seay
Faculty Advisors: Connie Cupples and Zoila Sanchez

The objective of this project is to determine whether implementing reminder systems to remove indwelling urinary catheters is effective for decreasing the incidences of catheter-associated urinary tract infections (CAUTIs) in patients who are hospitalized in acute care settings. The databases used to obtain relevant research were MEDLINE, CINAHL, PubMed, EBSCO, and ScienceDirect. The search terms used were nursing interventions, CAUTI, randomized controlled trials (RCT), catheter removal programs, stop orders, nurse reminders, urinary tract infections, and foley catheters. A combination of meta-analyses, RCTs, pre- and post-test studies, prospective cohort studies, and quasi-experimental studies was synthesized and used to conclude that reminder systems are of great value in reducing CAUTIs in hospitalized patients requiring indwelling urinary catheterization. It is noted that reminder systems also decrease the duration of urinary catheterization and unnecessary catheter days. Furthermore, a decrease in CAUTI is found to decrease hospitalization costs.

Knowledge Deficiencies in Women Related to Gender Differences in Myocardial Infarction: A Systematic Review

Presenters: Jana Combs, Lefonda Hill, Colby Ross, Stephanie Sells, and Christy Tipton
Faculty Mentors: Connie Cupples and Zoila Sanchez

Myocardial infarctions (MI) affect men and women alike, but the manifestations of this cardiac event in each gender can be greatly varied. The purpose of this systematic review is to examine existing information related to knowledge deficiencies in women regarding the atypical symptoms of acute cardiovascular injury. With current research suggesting a link between atypical myocardial infarction onset symptoms in women and a delay in treatment, a review of research published from 2005 to 2013 was conducted. 25 articles were reviewed using qualitative and quantitative methods. The conclusion to the review revealed that many women are unaware of symptoms of myocardial infarction that does not reveal a "textbook" presentation. The result of this knowledge deficit involves prolonging treatment and increased morbidity and mortality. In order to reduce the delay in treatment, providers must educate women regarding the disparity in symptoms between genders.

Preventing Catheter Related Local Infection in Orthopedic Patients with a Continuous Peripheral Nerve Block: An Integrative Review

Presenters: Alecia Breakfield, Erica Grissom, Melissa Hill, Dawn Whybrew, and Amanda Young
Faculty Advisors: Connie Cupples and Zoila Sanchez

The purpose of the integrative research is to determine if removing epidural catheters by postoperative day four is more effective than sterile technique in decreasing local infection in adult orthopedic patients. Clinical Question: In adult orthopedic patients, what is the effect of removing the continuous peripheral nerve block (CPNB) by postoperative day four on local infection occurrence compared with sterile technique in the postoperative period? Findings: Evidence concludes that regardless of the antiseptic used during sterile technique, all protocols are insufficient against *Staphylococcus* found on skin flora during the use of CPNBs. The catheter should be withdrawn by postoperative day four to decrease local infection risk factors. Conclusions: It has been concluded that adult orthopedic patients with a CPNB show decreased local infection rates with catheter removal by postoperative day four as opposed to sterile technique alone.

Acquired Adolescent Obesity: Could the Growing Rates of Insulin Resistance Also Be Indicative of Adolescent Atherosclerosis?

Presenters: Fhteachia Andrews, Angela Gipson, Ashley Nabors, Danielle Rosser, and Worthy Walker
Faculty Advisors: Connie Cupples and Zoila Sanchez

The purpose of this project is to explore the possible relationship of insulin resistant acquired adolescent obesity and adolescent atherosclerosis. Question: In adolescent obesity with insulin resistance is there a significant risk of developing atherosclerotic changes also? Methods: Review literature to determine if insulin resistant obese adolescents have an increased risk of developing atherosclerosis compared to adolescents without insulin resistance using thirty-six quantitative articles from the following online databases: PubMed, Google Scholar, and CINHAL. Synthesis methods include comparative tables and data that compared various tests such as biochemical analysis, lipid analysis, and C-reactive protein sensitivity. Conclusion: Insulin resistant obese adolescents were at a greater risk for developing atherosclerotic changes compared to non-insulin dependent obese children under the age of 18. Recommendation: Lifestyle modifications need to be stressed in the primary care setting to prevent the development of atherosclerosis under the age of 18.

An Integrated Review of Mentoring and the Effects on New Graduate Nurses

Presenters: Angela Fountain, Jennie Kellams, Taylor-Brooke McLean, Lauren Russell, and Karin Randolph
Faculty Advisors: Connie Cupples and Zoila Sánchez

The first year of nursing is a difficult transition for new graduate nurses. This transition can create dissatisfaction and decreased rates of retention within the clinical setting. The purpose of this integrated review is to determine the effects of a formal mentoring program on new graduate nurse job satisfaction and job retention. Do new graduate nurses who participate in formal mentoring programs report a higher incidence of job satisfaction and a higher incidence of job retention than those who do not participate in a formal mentoring program during the first year of clinical practice? The following databases were used Ovid, CINAHL, Google Scholar, PubMed, Medscape with search terms "new graduate nurse", "mentoring", "nurse residency program", "satisfaction." Research designs included descriptive, qualitative, and correlational studies. It is proposed that a formal mentoring program for new graduate nurses does not significantly impact job satisfaction but does increase retention.

STOP-BANG Questionnaire and Its Accuracy in Evaluation of Obstructive Sleep Apnea

Presenters: Blair Myers, Shannon Beville, Shelly Meiners, Rachel Mitchell, and Venessia Cunningham
Faculty Advisor: Zoila Sanchez

Obstructive sleep apnea (OSA) is a commonly encountered comorbidity in morbidly obese patients. Preoperative diagnosis and treatment of OSA reduces perioperative respiratory complications. The STOP-BANG questionnaire was developed to be a simplified, cost-effective, easily administered OSA screening tool. Question: Is the STOP-BANG an effective screening instrument in identifying patients with obstructive sleep apnea? Methods of review included available bibliographic sources, AANA, WorldShare, and Google databases. The search phrases used were "STOP-BANG and OSA", "OSA screening tools", and "accuracy of STOP-BANG". Conclusions: The STOP-BANG is a useful tool with high sensitivity that can be used to screen patients for moderate to severe OSA. Recommendations: OSA screening tools, such as STOP-BANG, are useful to include in a pre-anesthetic evaluation and accurate identification of patients with OSA.

An Integrated Review of Literature to Identify Key Selection Criteria to Use When Considering Deploying Acute Care Telehealth Technologies

Presenter: Deborah Fork Sampsel
Faculty Advisor: Cynthia Powers

Telehealth is one of the leading technologies that expand the reach of physicians and seasoned nurses. This poster presentation will illustrate an integrated review of literature pertaining to the use of electronic fixed telehealth devices and the remote telepresence mobile robot in hospitals' adult intensive care units. An iPad supported multimedia presentation will be utilized to demonstrate how these telehealth devices work. The case studies and research findings summarize knowledge pertaining to clinical outcomes, financial implications, technical support requirements, and environmental mechanisms to be considered when selecting and deploying these two types of telehealth care extenders. Future recommendations include a blueprint for using telehealth technology to bring the healing ministry of Jesus, to the sick and disenfranchised needing compassionate care, in a variety of settings. ■

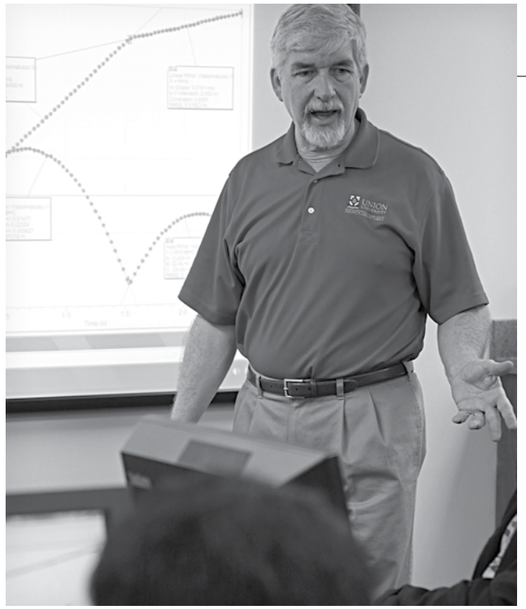
PHARMACY

The Influence of Source Credibility on Trust and Belief Strength of Health Care Information

Presenter: Lacie Hatcher
Faculty Advisor: Sean King

Objectives/Intent: Using a model of practical reasoning, the purpose of this investigation was to assess the influence of source credibility on trustworthiness of the provider and belief strength of health information provided by various health care professionals. Methods/Process: This study used a three-factor experimental design in which 179 undergraduates were randomly assigned to receive information about an influenza vaccination from one of three sources: pharmacist, physician or nurse practitioner. After measuring beliefs about the vaccination, credibility and trustworthiness of the source were assessed. Next, the participants were provided an addendum that contradicted the initial information they received and beliefs and trustworthiness were reassessed. Three 10-point Likert-type scales were used to assess all variables. Results/ Outcomes: There were no significant differences observed concerning the credibility of the three sources of health information ($p>0.05$). The magnitude of the beliefs formed and the belief change that resulted after the contradictory information was presented did not differ across information sources ($p>0.05$). The trustworthiness of the source providing the information was also found to be similar across the groups and did not differ significantly even after contradictory information was provided ($p>0.05$). Implications: These findings indicate pharmacists are viewed as credible as physicians and nurse practitioners when providing information regarding influenza vaccinations. The source delivering the information will not influence beliefs and the trustworthiness of each provider decreases similarly when contradictory outcomes are present. As one of the most accessible health care professionals, pharmacists can be instrumental in providing patients with the information required to make informed choices concerning immunizations. ■

PHYSICS



Do Students' Eye Movements Reveal Their Strategies for Solving Physics Problems?

Presenter: Betsy Olson
Faculty Advisor: David Ward

Physics Education Research (PER) seeks to better understand the way students learn physics and maximize their ability to learn it by improving how the discipline is taught. During the Kansas State University (KSU) Research Experience for Undergraduates (REU) program, learner strategies for solving kinematics problems in physics were investigated. A furtherance of work already being done at KSU, students' verbal solution methods and eye movements were recorded as they solved kinematics problems while looking at a computer screen connected to a Mirametrix eye tracker. Each solution method was associated with a particular type of cognition according to the Johnson-Laird cognitive framework. Researchers then investigated possible relationships between solution method and type of cognition.

Using Diffusion Tensor Imaging to Monitor the Effects of Proton Therapy on Normal Brain Tissues of Craniopharyngioma Patients

Presenter: Michael Lam
Faculty Advisor: Bill Nettles

The purpose of this study was to assess the safety of proton treatment on craniopharyngiomas and to measure the damages to normal structures within or near high radiation dose regions. Thirteen craniopharyngioma patients who received proton therapy were studied. Diffusion tensor imaging (DTI) data were obtained prior to treatment and at scheduled follow-up time points after the treatment. Fractional anisotropy (FA) and mean diffusivity (MD) were calculated from the images. These values were used to detect changes in the structural integrity of the pons of the brainstem, genu and splenium of the corpus callosum, and the thalamus. Changes in FA and MD were observed; however, changes did not occur above 5%, except for in one patient. During the first six months of proton therapy, treatment did not seem to significantly affect the structural integrity as assessed by DTI. Further investigation with longer follow-up is needed.

Dynamic Data Driven - Bidirectional Reflectance Distribution Function

Presenter: Jeffrey Lewoczko
Faculty Advisor: Bill Nettles

The purpose of this research was to theoretically determine which Bidirectional Reflectance Distribution Function (BRDF) models, from a selected set, conserve energy. In addition, the models were evaluated to see if they accurately represent the physical reality of a given sample when used to model a variety of surfaces. To do this, several BRDF models were selected and evaluated to determine if the energy remained bounded for the complete range of angles of incident light. The graphed results were also evaluated to see it they projected a continuous curve representing an accurate physical result for the object being modeled. This research project determined that the Ward, Ashikhmin-Shirley, and Sanford-Robertson BRDF models conserved energy, but were not necessarily always physical. In addition, the Ward-Duer, Cook-Torrance, Ashikhmin-Shirley, and Sanford-Robertson were determined to be physically representative within a specific range of parameter values. ■

PSYCHOLOGY

Academic Entitlement and Academic Dishonesty: Emerging Trends Among Millennial Students

Presenters: Jeffrey Paul, Joshua Morgan, Ariell Beasley, Darcie Williams, and Lydia Dahl
Faculty Advisor: Jinni Leigh Blalack

Previous research has shown high levels of Academic Entitlement (AE) to be a significant trend among millennial students. This study examined the relationship between AE and perceptions of academic dishonesty. AE was defined as the expectation of high grades without a focus on individual responsibility to achieve them. Millennial students were asked to rate specific academically dishonest behaviors in terms of offensiveness. It was hypothesized that participants who scored higher in AE would be less offended by academically dishonest behaviors. Data was gathered from 374 undergraduate students who completed a questionnaire regarding AE and perceptions of academic dishonesty. The sample was gathered from upper-level classes during the Fall 2012 semester. Statistical analysis was performed on the data using the Pearson r. Results supported the hypothesis, as millennial students who scored higher in AE tended to have lower perceptions of academic dishonesty. ■

SOCIOLOGY

A Study of Race in Christian College Promotional Viewbooks

Presenter: Courtney Rankin
Faculty Advisor: Nina Heckler

This research completed a content analysis of photographs in Christian college promotional viewbooks and then compared the percentages of different races of students shown in the viewbook to the actual percentage of white and non-white students in the school. Along with the content analysis a series of interviews was conducted with faculty members from the schools who are associated with choosing the advertising photographs in the college's viewbooks. The results of the content analysis of race in Christian college viewbooks found that the white students, as a whole, are over-represented and the non-white students are under-represented. Each of the schools are relatively accurate in the way they feature minority students in promotional material. The interviewers are in unison that their photographs do not over-represent their minority student population thus, the results of the content analysis support the marketers' beliefs about their promotional material. ■

SOCIAL WORK

A Comparison of Self-Esteem Between Freshman and Senior Undergraduate Women

Presenters: Rebecca Tarleton and Hollye Beth Brooks
Faculty Advisor: Rhonda Hudson

The researchers will investigate self-esteem between freshman and senior females at a Southeastern Christian University. Females often have a low self-esteem, which influences many different parts of their lives, such as the way they conduct themselves and the way in which they interact with others (Moksnes, Moljord, Espnes, & Byrne, 2010). Throughout history, females have struggled with this problem, regardless of age, race, or culture. It seems that starting in childhood, females struggle with self-esteem and feeling good about themselves, but it appears that as females grow older, they develop ways to cope, some successfully but some unsuccessfully. This study hopes to use research findings to compare average self-esteem scores using the Rosenberg Self-Esteem Scale as the measure. Analyses will include descriptive analyses for frequencies, percentages and means, and a t-test to compare two groups.

Existence of Contention Among Sororities

Presenters: Rebecca Evans, Anika Strand, and Morgan Turner
Faculty Advisor: Rhonda Hudson

This research explores the notion of tension among three sororities on a private Christian university campus in the southeastern United States. It draws from previous studies that address the formation of identity, group standards, and stereotypes within sororities. This research poses the research question of whether or not contention exists among sororities. The study will include 98 participants, who are sorority members, who will complete demographic and TENSE scale questions. The sorority members vary in age, race, and levels of involvement in the organizations. The data will be analyzed using frequencies, percentages, and means. Means of each subscale and the total scale will also be employed. Additionally, t-tests and ANOVA will be used to analyze the data. ■

THEOLOGY AND MISSIONS

God Saves Sinners: Calvin, The Doctrines of Grace, and the Mission of God

Presenter: Paul Christensen
Faculty Advisor: James Patterson

God Saves Sinners is both the title of this paper and the essential message of the doctrines of grace (Calvinism). The author seeks to communicate how the doctrines of grace both necessitate and motivate global evangelism. To some this may seem oxymoronic. However, this is exactly the myth that the author attempts to debunk. In this paper, the author retells the life of John Calvin and his evangelistic significance during the Protestant Reformation, defines and clarifies the doctrines known as the "five points", and examines how these essential doctrines of grace mandate evangelism. In addition, this paper also addresses the historical debate that orbits these doctrines and offers pastoral application designed to assist church lay people who are wrestling with these doctrines.

Old and New Perspectives on Justification: An Analysis of Martin Luther, N. T. Wright, and Thomas R. Schreiner

Presenter: Ryan Linkous
Faculty Advisor: James A. Patterson

The New Perspective on Paul is a relatively new method of interpreting Paul's writings based on the discovery and research of the Dead Sea Scrolls. Many of its proponents believe that the traditional Protestant doctrine of justification does not consider this new evidence and needs updating. This paper analyzes what Martin Luther, N. T. Wright, and Thomas R. Schreiner teach concerning justification from a Reformation, New Perspective, and contemporary Old Perspective position, respectively. After assessing each position, the paper views Galatians 2:15–16 through the lenses of each position to see how each affects exegesis and application. While scholars should incorporate more of Wright's teaching concerning the social impact of justification into their theology, one must not separate the judicial verdict of moral righteousness from justification.

Love Thy Muslim Neighbor

Presenter: Mark Waite
Faculty Advisor: James Patterson

From terrorists in Iraq, to the illiterate villagers of Afghanistan, Muslims demonstrate a greater grasp of hospitality and the "Good Samaritan" attitude than many of their Christian acquaintances. Fear, bitterness, and ignorance of Islam hinder Christians from loving their Muslim neighbors and reaching out to them with the Gospel of Christ. This research project examines the origins of Islam, as well as offering attempts of Christians loving and reaching Muslims. The project concludes with a challenge to Western Christians to strive to present the Gospel in such a way as not to limit the offense of the Cross, but to minimize the offense of cultural differences, while presenting the Message of Jesus from an Eastern frame of cultural reference. This point of reference starts with the Gospel's power over Shame, as opposed to the equally true starting point in the West of showing the individual's need to eradicate guilt.

Believers' Baptism by Immersion and Pre-Christian Antecedents: Making Connections

Presenter: Will Miller
Faculty Advisor: James Patterson

This research seeks to establish the origins and significance of believer's baptism by immersion by appealing to pre-Christian water rites as potential precursors of this New Testament practice. To this end, the author examined Old Testament water purifications, Jewish proselyte baptism, immersions practiced by the Essene community at Qumran, and the baptism of John the Baptist in order to elucidate what influence (if any) each may have had on believers' baptism by immersion. Because each rite represents a step in a progression that culminates in believers' baptism by immersion, connections are also drawn between them in order to demonstrate the development of the Jewish baptismal theology which may have influenced Christian baptismal theology. Key New Testament passages that support believers' baptism by immersion are also examined in light of the author's findings.

Church Planting in Urban America Among Young Postmoderns

Presenter: Tucker Watson
Faculty Advisor: James Patterson

Church planting in the United States is seeing a resurgence in 2013. The church as a whole is seemingly gaining more influence and needs to be leading culture not following it. Planters are faced with challenges and tough questions from postmodern young people who are tired of the norms and the emptiness popular culture feeds them with. The Church should be there leading the charge in shaping culture and engaging young people for Christ. However, there are specific ways in which the Church must engage these people in order to winsomely engage them. This paper examines some challenges and models for church planting in 21st century urbanized America specifically to young Postmoderns.

A Biblical Theology of Judgment in the Gospel of John

Presenter: Daniel Stands
Faculty Advisor: George Guthrie

Within the Gospel of John, the topic of judgment as it relates to Jesus and the Father is of special interest. The writer focuses much attention to the topic as he recounts Jesus' interaction with the people surrounding Jesus' ministry. There are a few points of apparent contradiction in the way which judgment is explained in connection with Jesus and the Father. Beyond these difficulties is a unique perspective on what judgment is and how Jesus uses the authority to judge as means of proving his Sonship. In light of various Judaic background texts, such as the OT and various Second Temple period texts, as well as the NT accounts, John's Gospel presents an especially unique description of judgment.

A Picture's Worth a Thousand Words

Presenter: Jason Kriaski
Faculty Advisor: George Guthrie

Visual imagery has played a meaningful part in the worship of God since the days of the Old Testament. However, the relationship between visual art and worship is a multifaceted and hotly contested aspect of the Christian life. Different approaches are espoused with differing levels of intensity within the different traditions of the Church. The mere fact that they have been used for millennia and are still used by many devout believers is reason enough to study the issue; the potential spiritual growth that images can yield in the lives of Christians is all the more compelling. Martin Luther's theology provides a much-needed and unfortunately-overlooked framework for the use of images in the worship of contemporary Evangelicals. Luther's theology of images provides a refreshing take on the issue and sheds light on the ordinate use of visual imagery in Christian life and practice.

THEOLOGY AND MISSIONS

The Media Portrayal of Demonology

Presenter: Matt Arnold
Faculty Advisor: James Patterson

This paper is about the media portrayal of demonology. I will be setting up the background of demonology and how the Bible has the appearance of demons. I will then move on to talk about different forms of interactions that have been seen and used. For example, movies and TV shows use a lot of exorcism. That is a way to seemingly make them feared. Another example is the most recent demon blockbuster called, "The Last Exorcism 2" where the main character ends up wanting the demon to be a part of her and she made the choice on her own. ■

SYMPOSIUM

TENTH ANNUAL UNION UNIVERSITY SCHOLARSHIP SYMPOSIUM

RESEARCH GRANT RECIPIENTS *Fall 2012*

Undergraduate

James Kerfoot and Sarah Porter
"It's a Stressful Life: Measuring the Stress Levels and Behavior of White Grunts from Hatchery-rearing to the Marketplace"

Michael Schiebout and Mark Kartzinel
"Assessing the Effects of Priority Growth and Competition of Invasive Japanese Stiltgrass on Native Sweetgum"

G. Jan Wilms and Jamie Fox
"Dawson's Dream"

Marc Lockett and Ryan Mantooth
"The Effects of Beta-2-Glycoprotein-1 on Thrombin Production and Catalytic Activity"

Andy Madison and James Patrick Clark
"Avian Communities Associated with Different Seral Successionary Stages after Clearcutting a Forest"

Jennifer Gruenke and Andrew DiBenedetto
"Developing an Assay to Detect Fusion Between Splenocytes and Myeloma Cells"

Mark Bolyard and Megan Nettle
"Regeneration of New Plant Tissue from Leaf Tissues of the African Mahogany"

Mark Bolyard and Robyn Reynolds
"Determination of Growth Regulators in Khaya senegalensis Regeneration"

Sally Henrie and Samantha Howard
"Incorporating Green Chemistry Principles into Development of AP-Level Labs for Qualitative Analysis, Redox Titration, and Enthalpy of a Reaction"

G. Jan Wilms and Dillon Lisk
"The Application of Swivel to Remote Photography"

Graduate

Sean King and Lacie Hatcher
"The Influence of Source Credibility on Trust and Belief Strength of Health Care Information

Andrew Tiger and Landon Preston
"The Significance of Online Course Use as a Predictive Variable for Alumni Giving at Union University"

UNION UNIVERSITY

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